
RESEARCH ARTICLE

Strawberry Agrotourism as a Solution for Farmer Income Diversification in Indonesia: Potential and Challenges

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ABSTRACT

This study aims to explore the potential of Strawberry Agrotourism in Indonesia as a solution to diversify farmers' incomes while identifying the challenges faced in developing this sector. This research uses a qualitative approach with descriptive methods through in-depth interviews, documentation, and field observations, with content analysis using NVivo 12 Plus. Gowa Regency was used as the locus in this study because the highlands of Gowa are considered not only as a vegetable-producing area but also a fairly well-known tourist destination. These findings show that even though strawberry production experienced a significant decline in 2020, Gowa Regency remains the area with the most significant strawberry production in South Sulawesi. This research found that developing strawberry agrotourism through activities such as strawberry picking tourism could be a solution to diversify farmers' income and attract more tourists. The main challenges identified include limited infrastructure, commodity price volatility, dependence on harvest seasons, and competition from other tourist destinations, which require attention for more sustainable development. Investment in supporting infrastructure, more effective marketing strategies, and business diversification programs for farmers are needed to reduce dependence on the harvest season and increase the competitiveness of agrotourism in the region.

KEYWORDS

Agrotourism, agricultural production, farmer income, price volatility, income diversification

ARTICLE INFORMATION

ACCEPTED: 01 November 2025

PUBLISHED: 30 November 2025

DOI: 10.32996/jeas.2025.6.4.1

1. Introduction

Agrotourism is a form of tourism that combines the agricultural sector with the tourism industry, which aims to provide educational and recreational experiences for tourists (Oltean et al., 2024; Wardani et al., 2024). In Gowa Regency, especially in the Malino area, which is famous for its natural beauty and fertile agricultural conditions, agrotourism has excellent potential for development. The beauty of the mountainous landscape, tea gardens, vegetable gardens and abundant fruit make Malino a superior destination that can attract tourists, both local and foreign (Amaliah et al., 2024). Through the development of agrotourism, farmers can increase their income not only from agricultural production but also from the tourism sector, which ultimately contributes to improving the regional economy (Askarova et al., 2023; Pham et al., 2023; Zulgani et al., 2023).

The Strawberry Farm in Pattapang, Tinggimoncong, Gowa Regency, Indonesia, is one of the new attractions in the famous Malino agrotourism area in South Sulawesi. At an altitude of 1,500 meters above sea level, this area has ideal conditions for growing strawberries, which usually require a minimum height of 1,000 meters above sea level and humidity suitable for subtropical plants (Cahyanti et al., 2021). Malino Strawberry Agrotourism offers a unique experience for visitors to pick and taste fresh strawberries

directly from the garden while enjoying the relaxed and beautiful atmosphere in the highlands. Apart from that, this garden is also an exciting location for taking photos, with a backdrop of lush strawberry trees, making it an attractive destination for tourists.

The Malino area in Gowa Regency has a long history as an agricultural area that supports the production of superior commodities such as vegetables, fruit, and tea (Firdaus & Didiet Haryadi Hakim, 2023). However, traditional agriculture often faces challenges in improving farmers' welfare, such as fluctuations in commodity prices and limited market access (Firdaus & Didiet Haryadi Hakim, 2023). The development of agrotourism is a strategic alternative to overcome these challenges by providing new opportunities for farmers to utilize their natural resources more optimally. Apart from increasing farmers' income, agrotourism can also create new jobs and strengthen the local economy through synergy between the agricultural and tourism sectors (Brandão & Rist, 2020). The development of agrotourism is a strategic alternative to overcome these challenges by providing new opportunities for farmers to utilize their natural resources more optimally. Apart from increasing farmers' income, agrotourism can also create new jobs and strengthen the local economy through synergy between the agricultural and tourism sectors (Kolawole et al., 2023; Little & Blau, 2020; Vrsaljko et al., 2017). Therefore, this research aims to analyze the potential and challenges faced in developing agrotourism in Malino as an economic driver of agricultural production in the Gowa Regency.

Theoretically, agrotourism is a concept that combines the agricultural sector with the tourism sector, where agricultural activities not only function as a source of food but also as a tourist attraction that can provide educational and recreational experiences for visitors (Evgrafova et al., 2020; Kizos & Iosifides, 2007; Winarno et al., 2022). According to the concept of sustainable tourism, agrotourism contributes to the diversification of the rural economy by integrating environmentally friendly and local culture-based tourism activities (Rosardi et al., 2022; Widiyanto et al., 2024). Agrotourism allows farmers to earn additional income by utilizing their land and agricultural products as part of tourist attractions (Ainakanova et al., 2023). Apart from that, agrotourism can also encourage infrastructure development, increase the capacity of local communities, and create awareness about the importance of environmental sustainability and sustainable agricultural practices (Ariffin & Yen, 2017; Dmitriyev et al., 2023).

In the economic context of agricultural production, agrotourism can be seen as a way to increase agricultural efficiency and productivity (Jumiyati & Frimawaty, 2024; Lun et al., 2021; Puljiz et al., 2022). Agricultural economic theory emphasizes the importance of income diversification as a strategy to reduce market risk and price uncertainty of agricultural commodities (Ivolga, 2015; Pope & Prescott, 1980). With agrotourism, farmers can expand their production value chain by offering agricultural products directly to tourists in fresh or processed form, as well as through activities such as fruit picking or educational visits to the fields. This can increase farmers' income and strengthen the local economy. Furthermore, agrotourism can help optimize agricultural land use by introducing integrated agricultural practices that support nature conservation, increase the competitiveness of local agricultural products, and strengthen farmers' bargaining position in regional and national markets.

Agricultural production economics studies how agricultural resources, such as land, labour, technology, and capital, are used to produce agricultural products efficiently. Agricultural production plays a vital role in meeting food needs, supporting economic stability, and creating jobs, especially in rural areas. Through the application of economic principles, this sector seeks to optimize the use of resources to maximize production results at minimum costs. In a global context, the economics of agricultural production is also related to international trade, food security, and its impact on the environment and ecosystem sustainability (Durham & Mizik, 2021; Okakwu et al., 2022).

One of the main challenges in the economics of agricultural production is fluctuations in agricultural commodity prices, which are influenced by global supply and demand, climate change, and government policies (Jost et al., 2025; Panyasing et al., 2022; Ramírez & Finnerty, 1996). Farmers often face high risks due to weather uncertainty and unstable market prices, which can affect their income. In addition, limited access to modern technology, inadequate agricultural infrastructure, and low levels of farmer education are obstacles to increasing production efficiency (Fikire & Emeru, 2022; Liu et al., 2024). Therefore, innovative solutions such as the use of environmentally friendly agricultural technology, increasing market access, and strengthening farmer capacity are urgently needed to overcome these challenges and support the economic sustainability of agricultural production.

In facing the economic challenges of agricultural production, agrotourism offers a solution that has the potential to strengthen the agricultural sector by diversifying farmers' incomes and increasing the added value of agricultural products. Theoretically, agrotourism allows farmers to utilize agricultural assets not only for food production but also as a tourist attraction that attracts tourists. This can increase farmers' income through various tourism activities, such as garden tours, picking produce, and selling processed products directly to tourists (Ciglovská, 2016; Jumiyati & Frimawaty, 2024). From an agricultural economic perspective, agrotourism also encourages more optimal land use by creating opportunities to integrate sustainable agricultural and tourism practices, thereby reducing pressure on land due to urbanization or decreased production (Baranova & Kegeyan, 2019).

Agrotourism operates based on the concept of sustainable economics and income diversification, which seeks to reduce the risk of agricultural market uncertainty by creating alternative income streams. According to sustainable development theory, agrotourism not only increases economic productivity but also strengthens social

relations between farmers and the community through tourist interactions with the agricultural environment (Rosardi et al., 2022). By involving tourists in agricultural activities, agritourism also promotes a deeper understanding of the importance of local agriculture and environmental sustainability. In addition, value chain theory emphasizes that agrotourism can extend the agricultural value chain, from production to consumption, by including elements of tourism and education, ultimately increasing the competitiveness of the local agricultural sector on the broader market (Le et al., 2021).

This is related to the diversification of farmers' income, which is an essential strategy in increasing economic resilience and reducing the risks faced by farmers due to fluctuations in commodity prices and dependence on one type of agricultural product. In the context of modern agriculture, diversification does not only involve developing different types of crops or livestock but also includes exploring opportunities in the agrotourism sector, marketing processed products, and providing additional services that can support income (Barrera & Elorza, 2021; He et al., 2023; Prommawin et al., 2024). By utilizing local resources and regional uniqueness, income diversification can provide broader access to markets, attract more consumers, and improve farmer welfare. This approach can also help farmers adapt to climate change and growing market demands, thereby creating a more sustainable and profitable agricultural system.

Overall, the agricultural production economy faces numerous challenges that require innovative solutions to increase the sustainability and resilience of the sector. Agrotourism is emerging as a promising alternative, not only to diversify farmers' income but also to increase the added value of agricultural products through direct interaction with tourists. By integrating the principles of sustainable economics and diversification, agrotourism can help farmers reduce risks related to commodity price fluctuations and dependence on one type of product while strengthening social connections and community awareness of the importance of local agriculture. Implementation of this strategy is expected to create an agricultural system that is more efficient, sustainable, and able to adapt to changes in market and environmental dynamics.

The research gap in this study lies in the lack of in-depth studies regarding the potential of strawberry agrotourism as a strategy to diversify farmers' income in the Gowa Regency, even though the agricultural sector in the area has significant potential. Most previous research focused more on aspects of agricultural production and the challenges faced without linking it to agrotourism development specifically. The novelty of this research lies in integrating the concept of agrotourism as a solution to increase farmers' income with a comprehensive analysis of the challenges faced in its implementation. With a qualitative approach and the use of data analysis technology such as NVivo 12 Plus, this research provides new insights into how agrotourism can be a sustainable and effective alternative to diversify farmer incomes, as well as identifying key factors that influence its success in Gowa Regency.

This research aims to analyze the potential of strawberry agrotourism as a solution to diversify farmers' income in the Gowa Regency, as well as identify the challenges faced in its implementation. By understanding how agrotourism can contribute to increasing income, this research seeks to provide strategic recommendations for farmers and stakeholders in the agricultural sector. In the economic context of agricultural production, this research also explores how agrotourism can increase the efficiency of agricultural resource use by creating added value through integration between agriculture and tourism. Through diversifying income generated from agrotourism activities, farmers can not only increase their economic resilience but also reduce dependence on conventional production, thereby creating an agricultural system that is more sustainable and resilient to market and environmental changes.

2. Materials and Methods

This research uses a qualitative approach with descriptive methods to analyze the potential and challenges of agrotourism as an economic driver of agricultural production in the Gowa Regency, especially in the Malino area. A qualitative approach was chosen because this research focuses on an in-depth understanding of the experiences, perceptions, and views of agrotourism actors and local farmers regarding the integration of the agricultural and tourism sectors. This approach allows the exploration of complex phenomena in local social and economic contexts, which cannot be measured quantitatively. By using qualitative methods, researchers can obtain rich and detailed data through in-depth interviews and field observations.

The number of informants in this research was determined using a purposive sampling method, where informants were selected based on specific criteria that were relevant to the research topic. A total of 10 informants were selected, consisting of farmers involved in agrotourism, managers of agrotourism tourist destinations in Malino, as well as regional government representatives responsible for the development of the agricultural and tourism sectors. The selection of informants was based on their capacity to provide in-depth information regarding the implementation and impact of agrotourism on the economics of agricultural production in the region. By focusing on selecting informants who have relevant knowledge and experience, this research is expected to produce data that is representative and rich in contextual insights.

Data obtained from in-depth interviews, documentation and field observations were analyzed using content analysis techniques. This analysis focuses on identifying themes, patterns and meanings that emerge from the data collected. The analysis process was carried out systematically to find the relationship between agrotourism and the economics of agricultural production, including factors that support and hinder the development of agrotourism in the Gowa Regency. In this stage, researchers used

NVivo 12 Plus, a qualitative data analysis software, to assist in the process of coding data, grouping themes, and constructing relevant thematic categories.

NVivo 12 Plus is used to increase efficiency and accuracy in managing and analyzing qualitative data. This software makes it easier for researchers to code texts more systematically, identify central themes, and build relationships between analyzed variables. With the help of NVivo 12 Plus, researchers can conduct in-depth content analysis and map the complex relationship between agritourism and the economics of agricultural production. Apart from that, using NVivo 12 Plus also helps in preparing more structured research results reports, with data visualization that makes it easier to understand research findings.

3. Results

Strawberry Production in Gowa Regency

Gowa Regency, specifically in the Malino agrotourism area, has become one of the mainstay tourist destinations in South Sulawesi. Hence, the expanse of strawberry plantations owned by the local community has an attractive aesthetic to be developed as a tourist attraction. The following is a table that presents strawberry production data in Gowa Regency in quintal units for 2019 and 2020:

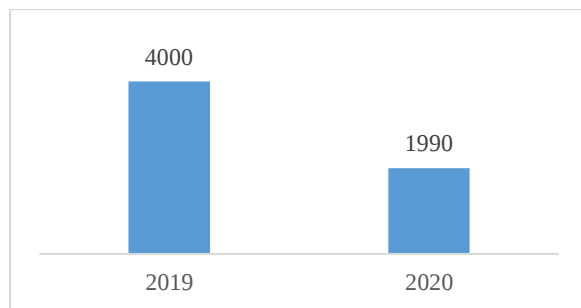


Figure 1. Strawberry production in Gowa Regency in quintal units for 2019 and 2020
Source: Department of Agriculture through horticultural agricultural survey, 2021

Figure 1 shows that strawberry production in Gowa Regency has decreased from 4000 quintals in 2019 to 1990 quintals in 2020. However, the largest strawberry production in South Sulawesi province still comes from Gowa Regency. The harvest area, production, and productivity of strawberries in Gowa Regency in 2022 can be seen in Figure 2 as follows:

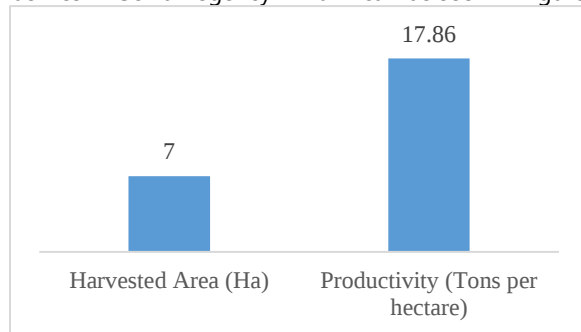


Figure 2. Harvested area and productivity of strawberries in Gowa Regency in 2022
Source: Gowa Regency Central Statistics Agency, 2023

Figure 2 shows that in 2022, the strawberry harvest area in Gowa Regency will reach 7 hectares with a total productivity of 17.86 tons per hectare. In the economic context of agricultural production, strawberry agrotourism in Gowa Regency appears as an innovative solution to diversify farmers' income. This approach not only focuses on traditional agricultural production but also integrates tourism activities that attract visitors, thereby creating alternative income streams for farmers. By exploiting the natural potential and beauty of strawberry gardens, farmers can offer tourists direct experiences such as strawberry picking, garden tours, and educational activities related to agriculture. This is in line with the economic principles of production, which prioritize efficiency and resource optimization. Agrotourism also provides opportunities for farmers to increase the added value of their products, as well as reduce dependence on fluctuations in agricultural commodity prices. Through synergy between agriculture and tourism, the potential for agrotourism in this area can be used as a central pillar in supporting farmer welfare and regional economic growth.

Analysis of strawberry production data in Gowa Regency shows a significant decline in production from 2019 to 2020. Strawberry production fell from 4000 quintals in 2019 to 1990 quintals in 2020. This decline in production can be attributed to several factors, such as changes in weather conditions, dependence on seasonality, changes in access to agricultural resources, or the possible impact of the COVID-19 pandemic disrupting agricultural activities. This decline in production reflects severe challenges in maintaining stable production levels, especially in the horticulture sector, which is highly influenced by climate variability and the availability of labour and other resources.

However, despite the decline, Gowa Regency remains the area with the most significant strawberry production in South Sulawesi, showing the great potential this region has. One way to maximize this potential is through agrotourism. By developing agrotourism, farmers will not only depend on production but can also use strawberry gardens as a tourist attraction, creating income diversification. Tourists can be invited to take part in activities such as strawberry picking, garden tours, and related activities, which not only increase income but also promote local agricultural products.

Potential of Strawberry Agrotourism in Gowa Regency

The following is a table that illustrates the comparison of the level of tourist visits in Malino under normal conditions and during long holidays:

Table 1. Comparison of the level of tourist visits in Malino under normal conditions and during long holidays

Condition	Average Visitors per Day	Number of Parked Cars per Day	Average Passengers per Car	Total Visitors
Normal Day (Weekend)	100 - 300 people	-	-	100 - 300 people
Long holiday	1.208 people	150 car	8 people	1.208 people

Source: Antaranews.com, 2023

Table 1 shows that tourism in Malino experienced a significant increase in the number of visits during long holidays compared to regular days (weekends). On average days, the number of visitors ranges from 100 to 300 people per day, but during long holidays, this number increases drastically to 1,208 visitors per day (Mappong, 2023). This shows that Malino is a beautiful tourist destination for tourists when they have a more extended holiday. This increase also reflects that tourists tend to consider Malino as a valuable holiday destination choice, especially for nature-based tourism such as strawberry agrotourism, which has the potential to be developed in this area.

Furthermore, data on the number of cars parked during long holidays, as many as 150 cars with an average of 8 passengers per car, shows that there is a tendency for tourists to visit in groups or families. This shows the potential for developing facilities that are more supportive of family and group visits, for example, by expanding the parking area and providing rides that are suitable for visitors of various ages. This phenomenon of increasing visits is also a positive indication of the potential of strawberry agrotourism in Gowa Regency because the high number of tourists shows significant demand for new tourist attractions that can provide unique experiences, such as picking strawberries directly from the garden.

The increase in the number of tourist visits in Malino, especially during long holidays, opens up great opportunities for the development of strawberry agrotourism in the Gowa Regency. Apart from attracting tourists to experience the unique experience of picking strawberries directly from the garden, agrotourism can also be a solution to diversify income for local farmers. By combining the agricultural and tourism sectors, farmers can earn additional income not only from harvests but also from entrance fees and other tourist activities. Strawberry agrotourism also provides added value to the local agricultural sector through direct sales of fresh or processed strawberry products, such as jam, juice, or typical souvenirs. Thus, strawberry agrotourism not only has the potential to attract tourists to the Gowa Regency but also creates broader and more sustainable economic opportunities for local farming communities.

Agrotourism Challenges in Gowa Regency

Although the potential for agrotourism in Gowa Regency, especially strawberry agrotourism in Malino, is very promising as a source of additional income and a new tourist attraction, its development is not free from various challenges. The following are four main points that describe the challenges of agrotourism in Gowa Regency related to the economics of agricultural production, especially strawberries:

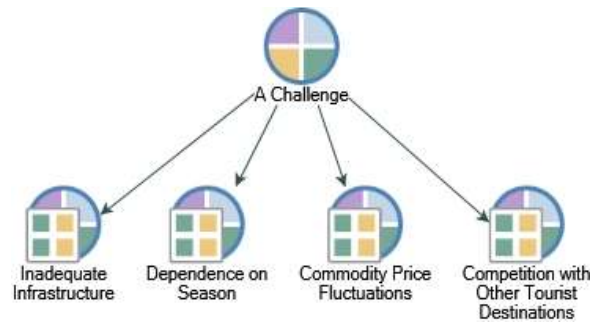


Figure 3. Challenges of Agrotourism in Gowa Regency
Source: Processed by researchers with Nvivo 12 Plus, 2024

Agrotourism in Gowa Regency, especially strawberry-based, faces several challenges that affect its development and contribution to the agricultural production economy. Limited infrastructure, instability in agricultural commodity prices, dependence on the harvest season, and competition from other tourist destinations. First, limited infrastructure, such as damaged roads and lack of supporting facilities in agro-tourism areas, hinders tourist accessibility and product distribution (Wardani et al., 2024). This has a negative impact on the number of visitors and reduces potential income from the agrotourism sector. Second, volatility in agricultural commodity prices is also a problem because fluctuations in strawberry prices can make farmers hesitant to invest further in agrotourism. This factor can influence the sustainability of farming businesses integrated with agricultural tourism.

4. Discussion

Furthermore, dependence on the harvest season is a significant challenge, as strawberry production is highly dependent on weather conditions and the right season. This makes it difficult for agrotourism that focuses on strawberries to maintain tourist visits throughout the year. In addition, competition from other tourist destinations in South Sulawesi, which are more established and have better facilities, means that the agrotourism area in Gowa needs to continue to innovate and increase its attractiveness to remain competitive. Effective management and promotion efforts are significant in overcoming these challenges and maximizing the potential of agrotourism in supporting the agricultural production economy in the area.

One example of the success of developing agrotourism through infrastructure investment and business diversification can be seen in the European Union countries. European Union countries have been pioneers in agritourism, which integrates agriculture with tourism. Investments in infrastructure such as cycle paths, tourist information centres and fruit-picking facilities have attracted many tourists to the agricultural fields. In addition, the country's farmers not only rely on traditional agricultural products but also offer unique experiences, such as farm tours, cooking workshops, and harvest festivals, which increase their income and provide exciting experiences for visitors (Ana, 2017; Karavasilis et al., 2016).

Another successful example is in New Zealand, where the government and private sector are working together to develop agritourism by offering local products and authentic experiences to tourists (Moore et al., 2018). The country has integrated agritourism into their tourism marketing strategy, making experiences such as visiting vineyards and cattle ranches a significant attraction. Through training and support for farmers to develop tourism products, New Zealand has succeeded in increasing the diversification of farmers' incomes while attracting increasing tourist interest. As a result, the agritourism sector in New Zealand not only makes a significant economic contribution but also helps preserve local traditions and ways of life.

In Italy, the Tuscany region is known as a successful agritourism destination. Tourists can enjoy hands-on farming experiences, such as harvesting grapes and learning about the local winemaking process. In addition, farmers in Tuscany also provide accommodation and food from local agricultural products, which not only supplements their income, but also promotes local culture and products to international visitors (Randelli et al., 2014). The success of agritourism in Italy shows that collaboration between farmers, tourism managers and local governments is essential to create tourism experiences that are sustainable and of high economic value.

Examples of successful agrotourism development in countries such as the European Union, New Zealand and Italy can be a valuable reference for the government and farmers in Malino, Gowa Regency, in reducing the challenges they face. By implementing similar strategies, such as investment in tourism infrastructure, developing unique experiences that involve tourists, as well as collaboration between farmers, tourism managers and local governments, Gowa Regency can increase the agrotourism attractiveness of strawberries and other agricultural products. These measures will not only help increase farmers' income and diversify their businesses, but also strengthen the local economy by attracting more visitors. Through an integrated and sustainable approach, Gowa Regency has the potential to make agrotourism an important pillar in regional economic development.

In the context of developing strawberry agrotourism in the Gowa Regency, diversifying farmers' income is the key to overcoming the challenges faced by the agricultural sector. By integrating agrotourism activities, farmers can not only rely on

agricultural products alone but also utilize strawberry gardens as an alternative source of income through attractive tourism activities. This approach allows farmers to reduce the risks associated with commodity price fluctuations and dependence on one type of product while increasing the added value of agricultural products through the hands-on experience offered to tourists. Through this diversification, farmers can expand market access, improve welfare, and create new jobs, thereby strengthening the local economy overall and creating a more sustainable and resilient agricultural system amidst existing challenges.

5. Conclusion

The main findings of this analysis show that although strawberry production in Indonesia, in this particular case in Gowa Regency, experienced a significant decline in 2020, this area still has great potential to continue to develop through the agrotourism sector. With limited harvested area but high productivity, there is an opportunity to increase strawberry production through technological innovation and better resource management. The challenges faced, such as dependence on the harvest season, limited infrastructure, and price instability, indicate the need for more targeted management strategies to increase farmer incomes and optimize agrotourism potential in this area.

The government and farmers in Malino, Gowa Regency can implement strategies, such as investing in tourism infrastructure, creating unique experiences that involve tourists, and building cooperation between farmers, destination managers, and local government; Gowa Regency can increase the agrotourism attraction of strawberries and other agricultural products. These measures will not only contribute to increasing farmers' incomes and diversifying their businesses but also strengthen the local economy by attracting more visitors. Through an integrated and sustainable approach, Gowa Regency has the potential to make agrotourism one of the main pillars of regional economic development.

Acknowledgments

The researcher extends sincere gratitude to Bosowa University for its support and facilitation throughout this research project. The financial support provided by the university's incentives and the researcher's initiative is also greatly appreciated. We thank all parties involved for their contributions and collaborative efforts.

Conflicts of Interest: The authors declare no conflict of interest.

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