Development Strategies of the Local Auction Market of Agricultural Product in Indonesia

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ABSTRACT
Agriculture plays an important role in Indonesia, but it is often neglected by various parties. As a result, farmers face many problems particularly when it comes to selling their products. The solution is to strengthen the agricultural institutions, especially the auction market. This institution has proven to provide many benefits for all parties. Farmers' products are sold in large quantities at high prices and strengthen the existence of farmer groups. Consumers also get high-quality products while the industry will get a continual supply of raw materials. For the economy, the auction market has been shown to improve agricultural trade efficiency and contribute to government revenue. However, the auction market's performance is still not optimal due to lack of rigorous rules, lack of quantity and quality human resources, lack of funds and infrastructure, competition with traders, and weak support from other parties. The auction market needs to make a good collaboration with suppliers, buyers, financial institutions, and the government.

Keywords
agricultural auction market, collaboration, competition, efficiency, high prices, rules

1. Introduction
Lubis [1] explained that agriculture in Indonesia contributes significantly to GDP, is a source of food and industrial raw materials, absorbs a portion of national labor, provides household income for most of the population, and is a way of life or a source of livelihood for the majority of farmers in Indonesia. This sector also has multiplier effects on industries, consumption, and investment.

Figure 1 shows one of agriculture's contributions to Indonesian GDP from 2016 to 2020. Agriculture's contribution to the Indonesian economy was relatively stable during this time period, indicating that this sector remained important to the Indonesian economy. Now, the contribution of this sector to GDP is in the third position, after the processing industries and trading. Agricultural products are also often used as raw materials in Indonesia's processing industry. This emphasizes the significance of agriculture in Indonesia.
Despite the fact that agriculture has made several contributions to Indonesia, it is still being neglected. The government has focused on food security by initiating input subsidies (seed, fertilizer, and pesticide) and procuring agricultural machinery, but has paid less attention to the output and marketing subsystems. As a result, farmer and fisherman welfare remains low, their bargaining position remains poor, and technology is difficult to disseminate to them [1]. Figure 2 shows that the farmer exchange rate (as an indicator of farmers' welfare) is always in the range of 100, either slightly below or slightly above it. In these conditions, farmers suffer losses or make only a small profit.
According to Dayat et al. [3], another problem for Indonesian agriculture is farmers' low education. The majority of farmers have either completed elementary school or have never attended school, and the average age is elderly. According to the Indonesian Bureau of Statistics [2], 36.19% of farmers in Indonesia do not graduate from school, 38.49% are elementary school graduates, 16.22% are junior high school graduates, 8.54% are high school graduates, and 0.56% are university graduates. Meanwhile, just 8.00% of Indonesian farmers are between the ages of 20 and 39, with the remainder being farmers over the age of 40. As a result, they tend to be conservative and difficult to accept new technology.

Hertel et al. [4] and Jankelova et al. [5] also mentioned another problem in agriculture, the economy's openness in the form of trade liberalization. In the short term, liberalization creates increased price volatility and a decline in farmers' welfare. Figure 3 shows that food prices in Indonesia highly fluctuate, particularly for garlic, shallots, and chili. This will cause problems for both producers and consumers. Producers would suffer losses if prices fall. Meanwhile, as food prices increase, consumers must spend more of their income to buy it.
This situation could be worsened if there are extraordinary conditions in Indonesia. Farmers' reliance on the government was obvious when the New Order regime\(^*\) ended in 1998. Farmers have lived their entire working lives under a top-down command regime, with little decision-making experience [6]. As a result, they found it difficult to market their products, especially since that time the Indonesian Bureau of Logistics\(^**) had been privatized, limiting its authority and financial capacity to buy agricultural products from farmers. Another condition, the rise of world food prices in 2007–2008, contributed to an increase in poverty and inequalities in rural areas, where the majority of people are farmers. Owners of farmland and capital in rural areas are the only ones who benefit from higher food prices [7]. Finally, the Covid-19 outbreak has made farmers who are already poor more vulnerable [8].

According to data from the Indonesian Bureau of Statistics [2], the farmers' exchange rate was 102.09 at the start of the pandemic, March 2020, and then declined by 99.60 in June. Farmers' welfare suffers as a result of social restrictions that make it harder for them to sell their products.

Another problem is that the Indonesian marketing system has been dominated by traders who create long marketing channels. They take advantage of farmers’ lack of market information and farmers’ need for quick cash or credit [6]. Farmers' marketing functions, such as transportation, grading, sorting, and packaging, seem to be wasted when they negotiate in the market. Traders have the power to set market prices so that farmers get low prices,

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* New Order regime: the regime has ruled Indonesia from 1966-1998
** Indonesian Bureau of Logistics: state-owned institutions that take care of Indonesian food needs
which is often detrimental to farmers [9]. This could worsen during harvest season when abundant production causes a drop in market price. While, a long marketing channel results in high transaction costs and a low return to farmers [10].

One of the ways for overcoming marketing problems is to strengthen institutions or commonly known as collective marketing. One example of this is the establishment of the agricultural auction markets [11]. In Indonesia, several auction markets have been recently established. This institution serves as a forum for market participants to negotiate the selling and purchase of various agricultural products (rice, vegetables, potatoes, rubber, copra, nutmeg, cardamom, fish, processed food and others). So, it is interesting to learn about the situation of agriculture auction markets in Indonesia. This paper tries to examine the regulations regarding the local auction market of agricultural products, its role in the agricultural market, and the various challenges that must be resolved.

2. Agricultural auction markets in the world

Before discussing the situation of the local auction market of agricultural products in Indonesia, this paper tries to study the auction markets in other countries in order to learn from their success stories. Several research results indicate that the agricultural auction market in developed countries provides numerous benefits to market participants. Meulenberg [12] performed the first study on the Dutch auction market. There are two co-operative flower auction markets and one co-operative of the potato processing supplies the industrial. Due to the poor performance of wholesalers, the first auction market was established in 1889 to market potatoes. Then, the number of auctions increased rapidly with a huge turnover. It also expanded Dutch fruit and vegetable exports to England and Germany. From 1915 to 1940, the turnover of the Dutch auction market increased, rising from 362 million guilders to 1,039 million guilders for fruit and vegetable sales and from 6 million guilders to 97 million guilders for flower sales.

The marketing function carried out by the auction market has improved into price discovery, quality control, assembling of products, and payment guarantee to growers. This is particularly remarkable because auction activities are operated locally or regionally, without national coordination. Eventually, these various auction markets merged as cooperative auctions.

After the merger, the cooperative auction market arranges price, product, promotion, and distribution. There are many ways to do this arrangement, such as to set up minimum price schemes for many varieties of fruits and vegetables; paying closer attention to product freshness and chemical content; continue to increase promotion funds to stimulate demand; and focus and constantly review on distribution, particularly logistical efficiency. This institution's other strength is equipped with product policy, market research, promotion and extension, as well as prices and market information [12]. According to Meulenberg and Viaene [13], these cooperative auctions also developed brokerage selling operations in pot plants and future auction products. Tourte and Gaskell [14] stated that these various steps, especially consolidation, have stimulated competition among buyers as the number of the auction markets has become small, eventually raising the selling price of horticultural products.

However, this auction market also faces challenges of competition from traders. Many independent growers sell flowers to traders, do not market through an auction, or what is called "around (or skipping) the auction." This phenomenon is spreading as farmers believe they are getting a better price and incurring lower marketing costs by selling directly to traders. As a result of this challenge, the Dutch auction market turnover fell in 1992 compared to the previous year. Although there are some other factors contributing to the decline in auction market turnovers, such as lack of modernized infrastructure, the slow pace of the logistics system, and others [15].
Another developed country, the United States, has many auction markets. First, the Northeast Ohio auction market has the main function to market fruits and vegetables. Farmers can sell their products in bulk at high prices by using the auction market. Meanwhile, the auction market will ensure that buyers receive a fair price. The price formed in the auction market is also a consideration for farmers planting decisions, especially the types of plants and the time of planting. There are 34% of market participants followed the auction market manager's advice and planted new horticultural crops [16]. Second, there are nine auction markets in Pennsylvania. The auction markets are able to sell farmers' products at high prices. The auction market manager will report prices to farmers in the early and late of the harvest period. This information could encourage farmers to adjust their planting dates in order to harvest produce at that time. It is also located close to rural areas, which reduces farmers’ transportation costs. This auction market's strengths include active conveying information to farmers and buyers through local newspapers, personal contact, direct mail, word of mouth, long-term establishment, reputation, meetings, and newsletter; excellent product quality; the ability to ensure customer availability; and excellent quality manager and professional skills. However, this auction market has one weakness, namely buyers continue to complain about poor grading [17].

The CTA actually allows the seller to set a minimum price, but the seller does not take advantage of this chance because they want sell their product as soon as possible and are willing to accept any price. This auction market is capable of selling 98% of Sri Lanka's tea production. The CTA has several shortcomings, including requiring participants to be present so that it takes lot of time; farmers often receive low prices; farmers sell to the auction market through a third-party manufacturer due to lack of their own transportation and manufacturing facilities; new farmers have difficulty accessing the auction market, and there is a payment delay system, seven days after the transaction [18].

The auction market is conducted not only physically but also online. This market has been implemented in India, making the auction process easier because participants do not have to come to the location, activities can be carried out every day, and the auction market participants receive a fair price. However, the online system can only be used by more experienced participants and has limitations in terms of quality verification [19].

According to some literature, the keys to the successful development of the agricultural auction markets are strict regulations, good management, support from other parties, strategic location, and continuous innovation. But there are still many challenges that prevent it from performing optimally.

3. Agricultural auction markets in Indonesia

3.1 Regulation

According to the National Agency of Commodity Future Trading (NACFT) Act 7/2018, the auction market is an organized physical marketplace for buyers and sellers who perform commodity transactions through an auction system. Business activities of this market can only be carried out by a legal entity (limited liability company or cooperatives or regional companies) that has received approval from head of the NACFT. The amount of capital in the auction market is affected by differences between legal entities. If the auction market is incorporated, the capital must be IDR 1 billion, and if the legal entity is cooperative, the capital must be around IDR 250 million.

In Indonesia, there are numerous agricultural auction markets run by local governments, cooperatives, and privates. Table 1 shows the number of agricultural auction markets located in Indonesia. The data is from an auction market that is listed on the NACFT. However, there are a lot of local auction markets that are not included in this database.
Table 1: The auction market organizer in Indonesia

| Province          | Name                                                                 |
|-------------------|----------------------------------------------------------------------|
| Aceh              | Meukat Komoditi Gayo                                                 |
| West Sumatera     | Grafika Jaya Ltd                                                      |
| Jambi             | Local Government of Industry and Trade                               |
| Riau              | Kuantan Singingi Rubber Farmers Association Cooperative              |
| Lampung           | Local Government of Trade                                            |
| Jakarta           | Asia Commodity Marketplace Ltd, Jakarta Future Commodity Ltd, Bahtera Komoditi Indonesia Ltd, Pasar Indonesia Ltd, Asia Pacific Commodity Market Ltd |
| West Java         | West Java Auction Market Cooperative                                  |
| Central Java      | Wira Agri Aneka Jaya Cooperative                                     |
| Yogyakarta        | Local Government of Industry and Trade                               |
| East Java         | Puspa Agro Ltd                                                        |
| West Nusa Tenggara| Local Government of Trade                                            |
| North Sulawesi    | Local Government of Industry and Trade                               |
| Southeast Sulawesi| Local Government of Industry and Trade                               |
| South Sulawesi    | Puskompas Cooperative                                                |
| Gorontalo         | Local Government of Cooperative, Industry and Trade                  |

Source: [20]

The NACFT was in charge of formulating and implementing policies of development and supervision of the agricultural auction markets. Technically, the activities include checking the completeness and validity of documents, assessing business plans, approving management rules, testing managers' competence, examining physical facilities and infrastructure, and evaluating the auction market activities.

The auction market has managers to carry out a various of activities. According to the Minister of Industry and Trade Regulation 650/2004, the auction market managers are in charge of preparing facilities and infrastructure; determine the place and date of implementation, commodity specifications, and auction sessions; evaluate and test the qualifications of the auction member candidate and decide to accept or reject the candidate; monitor prices together with the clearing and guarantee institutions (CGI); determine the amount of member savings and auction service fees; supervise transaction settlements and take measures to ensure transactions are carried out in accordance with the procedures and dispute settlement mechanisms; and send recorded transaction data to the CGI as well as the NACFT. The CGI's have aims to provide registration, clearing, and guarantee services for the auction market in order to ensure the orderly, equitable, and effective settlement of transactions.

The auction market members consist of individual farmers/producers, farmers/business groups, cooperatives, traders, firms, industries, or exporters. The requirements to become members of the auction market include: individual Indonesian citizens or firms that have legal entities, must reside or domicile in Indonesia, have good integrity, and pay a membership guarantee fund.

Members of the auction market have duties, such as obeying the procedure and administration of transactions, paying funds as members and guarantees in the auction market, testifying in the event of a dispute, and being responsible for any errors or violations of rules in the auction markets. Meanwhile, they also have the right to receive the same treatment and market information from the auction market managers and to appoint a party to represent them in auction market transactions.

In Indonesia, there are various auction mechanisms, both open and closed. The first mechanism, open auction, begins with collecting the agricultural products from farmers. When this process has been completed, auction market managers will immediately provide information to buyers through various media, such as mobile phones. The buyer makes a bid, and the buyer who offers the highest price will be the winner [21]. According to Nugroho et al. [11], the closed auction mechanism is used by many auction markets in Indonesia. The closed auction mechanism starts
when traders writing their bid on a piece of paper and inserting it into the designated box. The highest bid price from a trader will be the highest price agreed between the bidders (traders) and the auction market administrators in the auction market. Both mechanisms have proven to provide transparent and fair price, most importantly to elevate the price higher than the conventional sales system. According to Parsons et al. [22], this model was originally used to sell fish in Tokyo, hence the name "Japanese auction." The buyer offers price in the closed mechanism and bidding closes at a fixed time. Products are sold to the highest bidder.

As previously explained, Indonesia has a massive number of auction markets. Farmers organize local auction markets in many Indonesian areas to coordinate the selling of their agricultural products. This is a form of farmers improving their welfare because of their weak bargaining position and often receive low prices.

This local auction market is traditionally managed with simple equipment. The majority of the participants are local farmers and traders. This is in contrast to modern auction markets, such as agricultural futures exchanges, which can only be accessed by companies represented by brokers in order to buy and sell agricultural products.

3.2 Benefits

The agricultural auction markets in Indonesia give many benefits to their participants. Farmers will use auction markets to improve their bargaining position when negotiating with other traders. Farmers are usually could not to negotiate, so they must accept the price offered by traders. Moreover, farmers are always afraid that their products will not sell and want to be paid as soon as possible after harvesting. However, with an auction market, farmers will be represented by auction market managers who are capable at negotiating with traders. The auction market manager also provides farmers with accurate market information, especially prices. They will always update price information in various main markets both in the provincial capital and Jakarta. They are actively attempting to communicate with traders in that market. Managers are also responsible for helping farmers in obtaining marketing networks and payment agreements as well as communicating with buyers. Finally, farmers can sell products in large quantities at high prices. The auction process requires buyers or traders to compete with each other, resulting in the winner with the highest bid price. As a result, farmers who sell to the auction market will get a higher income than those who sell to other places [23, 24, 25, 26, 27].

This situation is illustrated in Table 2, which indicates the prices of agricultural products in some local auction markets. Farmers in Jambi were able to sell more rubber at higher prices thanks to the auction market. Meanwhile, farmers in Yogyakarta who sell chili to the auction markets get a price up to 2 times higher than those who do not sell to the auction markets. There is a competition among traders so prices will continue to increase. Then it empowers farmers in terms of food, clothes, housing, labor, health, lifestyle, information, and other [28].
Table 2: Comparison of price, quantity and income of farmers who sell and do not sell to the local auction market of agricultural products in Indonesia

| Criteria                                           | Sell          | Do not sell     |
|----------------------------------------------------|---------------|-----------------|
| 1. Rubber auction market in Tebo Regency, Jambi Province |               |                 |
| a. Price (IDR)                                     | 7,000         | 6,500           |
| b. Quantity (kg)                                   | 395           | 344             |
| c. Income (IDR)                                    | 1,411,673     | 1,141,023       |
| 2. Rubber auction market in Bungo Regency, Jambi Province |               |                 |
| a. Price (IDR)                                     | 10,300        | 8,200           |
| b. Quantity (kg)                                   | n.a           | n.a             |
| c. Income (IDR)                                    | n.a           | n.a             |
| 3. Chili auction market in Kulon Progo Regency, Yogyakarta Province |         |                 |
| a. Price (IDR)                                     | 23,000        | 11,350          |
| b. Quantity (kg)                                   | n.a           | n.a             |
| c. Income (IDR)                                    | n.a           | n.a             |

Source: [26, 29, 30]

Apart from high prices, the auction market also provides price certainty. The selling price of agricultural products always changes according to the availability and quality of production and market conditions. However, the auction markets can still adjust to these conditions ensuring that price decisions do not have a negative impact on farmers [9]. This phenomenon is illustrated in Table 3 where the price of agricultural products in the auction market rises and falls in accordance with the price in the regency and Indonesia.

Table 3: Comparison of chili price at Sleman auction market, Sleman Regency, and National

| Month | Week | Price at Sleman Auction Market (IDR) | Price at Sleman Regency (IDR) | Price at National (IDR) | Price at Sleman Auction Market (IDR) | Price at Sleman Regency (IDR) | Price at National (IDR) |
|-------|------|-------------------------------------|------------------------------|-------------------------|--------------------------------------|------------------------------|-------------------------|
|       |      | Cayenne Chili (IDR)                 |                             |                         | Cayenne Chili (IDR)                 |                             |                         |
|       |      |                                     |                             |                         |                                     |                             |                         |
| October | 1   | 26,200                              | 25,056                      | 29,756                  | 35,500                              | 34,833                      | 40,091                  |
|        | 2   | 27,000                              | 27,679                      | 30,334                  | 28,916                              | 32,714                      | 40,982                  |
|        | 3   | 24,357                              | 25,071                      | 30,112                  | 23,928                              | 24,607                      | 39,426                  |
|        | 4   | 17,928                              | 19,500                      | 28,535                  | 24,642                              | 23,923                      | 38,910                  |
|        | 5   | 14,100                              | 14,577                      | 26,227                  | 25,900                              | 26,038                      | 38,172                  |
| November | 1  | 21,062                              | 19,964                      | 23,498                  | 28,000                              | 27,464                      | 37,922                  |
|         | 2  | 22,214                              | 21,808                      | 26,954                  | 23,714                              | 24,731                      | 38,101                  |
|         | 3  | 20,500                              | 21,143                      | 26,210                  | 18,214                              | 18,429                      | 37,110                  |
|         | 4  | 17,000                              | 17,136                      | 23,191                  | 20,785                              | 20,727                      | 33,299                  |

Source: [31]

In addition, the existence of the agricultural auction market is also able to strengthen farmer groups by growing cooperation, kinship, openness, and trust among members [9, 32]. The function of farmer groups in land protection, agricultural cultivation, and marketing can be maximized after the auction market exists [24]. Farmers are refusing to sell their land and prefer to cultivate profitable crops due to increased profits. Even, farmers are willing to follow the direction of the farmer group leader to cultivate crops at the same time to ensure continuity of supply in the auction markets [33]. Many farmer groups are also able to make partnerships with other institutions such as banks, universities, the government, and others, due to the increased performance of farmer groups that participates in the auction markets [24, 25].
For economic activity, the auction markets increase the efficiency of the agricultural trading system. The auction market shortens the marketing channel by reducing the number of traders involved in distribution. This is shown in Figure 4, where farmers in traditional channels (A) usually have to sell their products through traders in hamlets, villages and sub-districts. However, with the auction market (B), farmers can sell directly to the auction market and the agricultural products are then sold to traders in the regency through an auction process. This significantly reduces the marketing margins and costs [25, 34].

![Figure 4: Marketing channels before (A) and after (B) existing of the agricultural auction market (Source: [23, 28, 35, 36] modified by author)](image)

Even, Kuntadi and Jamhari, as well as Stevan et al. [29, 30] stated that the agricultural auction markets are more efficient than other markets since the monopoly index and marketing margin are lower than the traditional system, but farmers' share can be higher. An efficient marketing system also makes the price gap of agricultural products at the farmer and consumer levels not much different. Kuntadi and Jamhari [29] presented examples of the efficiency in the auction market. The margin for marketing channels other than the auction market is IDR 14,650 per kg of chili, while the margin for marketing channels through the auction market is smaller, namely IDR 13,150 per kg.
Darina [25] mentioned other benefits that consumers get from the existence of the auction market are high quality product. The stringent sorting and grading processes, as well as huge incentives for producers, are the main cause of this quality improvement. Farmers must follow product requirements in any auction market. Auction market managers are required to be careful to check the agricultural products and are forced to return poor-quality products to farmers [37]. Meanwhile, the industry will get a lot of benefits if it is able to collaborate with the auction markets so there is a certainty about the supply of raw materials with affordable prices [38].

Triyanti and Hikmah [39] also stated that the agricultural auction markets contribute to the government through the payment of parking retribution and help facilitate access to agricultural data collection. The quantity and price of agricultural products sold will be reported to the local government by the auction market manager. Then, it will be processed to become a reference price in each regency or national level. This information will be used by the government to make policies or intervene to improve the agriculture sector.

Last, Sukes and Farid [38] stated that the agricultural auction market will improve communities' welfare because it is able to increase the productivity of the regional economies. If farmers get a high price in the auction market, they will be motivated to increase their production. Then, this will increase regional income and welfare.

Table 4 summarizes the various benefits of the local auction markets of agricultural products.

| Criteria         | Farmers                                                                                                                                                                                                 | Traders/buyers                                                                                     |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| Price            | higher than having to sell directly to traders                                                                                                                                                           | lower due to reduced transportation costs                                                           |
| Product          | motivated to improve quantity and quality in order to satisfy the needs of consumers                                                                                                                    | get better quality since there are sorting and grading process in the auction market               |
| Transaction/negotiation | easier because it only deals with the auction market managers                                                                                                                                                                   | easier because it only deals with the auction market managers                                         |
| Social           | increasing farmers’ bargaining position and relationship among farmers                                                                                                                                     | strengthening relations with auction market managers                                              |
| Economy          | Increasing farmers’ welfare                                                                                                                                                                               | spend less money to purchase products                                                               |

3.3 Challenges

Despite its numerous advantages, many agricultural auction markets in Indonesia are unable to carry out their functions effectively. Even though it has various benefits, but many agricultural auction markets in Indonesia cannot perform well their functions. Although in the previous point of this paper that the auction markets were able to create certainty and transparency price, there are more auction markets that were unable achieve it [40]. The failure of the auction market to carry out its functions is due to various reasons.

First, the auction market rules are poorly implemented. The lack of socialization of the rules caused market participants do not understand their rights and responsibilities in the auction market [36]. According to Martius [41], the manager failed to fulfill its duty to provide information on specifications and the number of products traded by the auction markets. Meanwhile, farmers often fail to fulfill their duty to supply products to the auction markets, preferring to sell directly to traders [42]. Anugrah [35] stated that this situation occurred because the farmers were still in debt to the traders and were forced to sell their products to the traders. However, Rusdiyana [34] said that the auction market's delayed payment process is the main cause of this phenomenon. Farmers receive payment for the product sales a few days after the auction process. Meanwhile, traders are able to meet farmers' expectations of receiving payment in cash directly after product delivery.
Buyers in the auction market often violate the deals, especially in terms of payment. There are auction markets that allow buyers to pay a few days after the auction process, but certain buyers do not pay until the agreed-upon day. As a result, the auction markets suffer because they must first expend money to pay farmers [9].

The regulation violation in the auction market was also caused by weak supervision from the NACFT and the CGI. The NACFT allowed the auction market to continue operating amid the fact that some market participants missed membership licenses provided by the local government. The main cause of this problem is the NACFT's lack of clarity regarding auction market membership arrangements. Meanwhile, the CGI has not always succeeded in directing market participants and managers to follow the rules in an orderly manner [42].

As a result of these various violations is the failure of transactions in the auction market, both failure in terms of payment and to deliver products [43, 44]. Transaction failure is also caused by the quantity and quality of the product not being in compliance with the agreement. A number of agricultural products are still seasonally based and produced by farmers using simple technology, resulting in differences in quantity and quality that do not reach the standards desired by consumers in the auction markets [41].

The second problem facing Indonesia's agricultural auction market is the limited quantity and quality of the administrators and participants [36, 38, 40, 43]. The limited number of workers makes activity in the auction market not optimal, especially during the harvest season. Many farmers must queue to supply their crops to the auction market, so they are not satisfied with the services of this institution. Meanwhile, traders feel the same sentiment because workers at the auction market are unable to help them in transporting the products to the traders' vehicle [45].

The quality of human resources that do not understand auction management makes them unable to predict the market situation and create a marketing network [40]. Moreover, since the managers are unfamiliar with the auction market management system so many activities are ineffective, especially in the promotion of the auction market. Managers and market participants dare unable to use digital technology. Almost all processes on the auction market are done manually. As a result, the auction market's process is slow and some errors have occurred. This problem then made market participants were dissatisfied [46]. According to Subejo et al. [47], modern information and communication technologies (ICTs) are only used by peoples who are young and well-educated, have a higher income, and have access to infrastructure and telecommunication networks. Meanwhile, most of the managers and participants of the auction market are aged and uneducated, making it difficult for them to use modern ICTs.

The shortage of funds and infrastructures are the third problems faced by Indonesia's agricultural auction markets [36, 40]. There are several auction markets that apply the management fee mechanism for the products sold. This fee has two purposes: cash and investment for infrastructure improvements in the auction market. The fee value depends on the price of each product unit, the management fee will rise alongside an increase in the product price and vice versa [11]. However, many auction markets lack the necessary capital to develop their performance or infrastructure. They are having problems accessing funds from banks and other financial institutions. As a result, this auction market is underperforming.

The incomplete infrastructure also triggers the auction market could not to perform optimally [38]. The small storage warehouse makes the auction market unable to serve farmers during the harvest season. Many farmers' products are then placed around the auction market so their quality and selling price decrease [36]. They do not have access to pricing information in main markets in district capitals or in big cities. They also cannot communicate with other parties in order to find out consumer product demands [43].

Furthermore, up to now, many auction markets have faced competition with traders. This problem is understandable because these traders existed prior to the auction market. The traders will come directly to the
production center area to negotiate with the farmers in order to convince them to sell their products to the traders [41]. Santoso et al. [43] have reported that traders also participate in the auction market. Traders typically collude so that the auction market structure becomes oligopsony and they have an absolute position as price makers. As a result, the auction selling price is poor, which is detrimental to auction participants, especially farmers.

The last challenge is a lack of support from other institutions for the auction markets [38]. Banks still do not trust the auction market participants so they have been unable to provide them with financial access assistance. Even though managers need funds to complete the auction market's infrastructure and other participants need funds to resolve trades in the auction market [41]. In fact, the auction market is supposed to serve as a connection between farmers and banks, reducing farmers' reliance on middlemen for capital [25].

Another institution, the government, has been less than ideal in providing support for the development of the auction market and regularly supervising its implementation [43]. The government budget allocation for the development of the auction market is still very limited [40, 41]. If the government intervenes as much as possible, it will improve auction market performance, such as infrastructure procurement. It will improve the quantity and quality of agricultural products in the auction market [27].

These various problems have resulted in decreased public trust to the auction market. The participants have lost their attractiveness to follow the agricultural auction markets [38]. This is indicated by the low number of new auction market participants and their irregular participation at each auction process [38, 42].

After reviewing a lot of literature, the local auction market of agricultural products in Indonesia faces challenges such as limited equipment, a lack of technology, a small number of workers, and other factors. All of them are shown in Table 5.

| Criteria | Type of challenge |
|----------|------------------|
| The auction market rules were poorly implemented. | Some local auction markets were poorly organized |
| | Discontinued supply |
| | Delayed payment |
| | Transaction failure |
| Limited quantity and quality of the agricultural auction market administrators and participants | The services were slow and had some errors |
| | Inefficient management process |
| Lack of funding and infrastructure | Difficulty in accessing funds |
| | Agricultural products are not well handled |
| Faces competition with traders | Farmers' stocks have been reduced because traders have bought them |
| | The auction market price dropped as a result of trader collusion |
| Lack of support from other institutions | Market participants had difficulty in accessing the funds |
| | The auction market performance is not optimal |
| | Lack of public trust to the auction market |

### 3.4 Strategy

A strong cooperation with other parties is the key strategy for developing the auction market in Indonesia. Managers need to be active in collaborating with suppliers (farmers or farmer groups), buyers (traders and industries), supporting institutions (banks, financial institutions, and the private sector), and the government (the NACFT and the trade and agriculture services). This collaboration is presented in Figure 5 with various product, financial, and information flows.
Figure 5: Local auction market collaboration with other parties

Farmers and farmer groups are agricultural products suppliers for the auction market (product flow). Then, they receive payment from the auction market (financial flow). In this connection, the auction market and farmers must have a strong commitment to fulfilling their obligations. Farmers must continuously supply to the auction market in order for this institution to perform optimally, while the auction market must guarantee that farmers’ products are sold at high prices. So far, farmers often had debts with middlemen, making it difficult for them to sell their products on the auction market. Therefore, the auction market needs to provide farmers with high price incentives. Later, farmers will be interested in selling to the auction market in order to pay off loans owed to middlemen. Even, the auction market can provide production factor assistance, which farmers can pay for during the harvest season. This is done to reinforce the emotional relationship between farmers and the auction market, so that farmers commit to selling their products to the auction market. However, managers must also strictly apply rules on the auction market and provide punishments if suppliers violate the rules. This ensures supply continuity, product quality standards and prevents transaction failures.

The second collaboration is between the auction market and the buyer. In principle, the auction market will be in charge of ensuring the supply continuity of agricultural products to buyers (product flow) and then the auction market will receive payment from the buyer (financial flow). Managers need continuously to find buyers to ensure that as many people as possible engage in the auction process. This is done to discourage buyer collusion. The greater the number of buyers, the less consensus there is on pricing agreements between buyers. This also results in tighter price competition ensuring that the auction process produces the best prices for the auction market and buyers. Another advantage is that the auction market managers get a lot of price information from buyers. This is to determine the expected standard price in the auction market.
In fact, the most profitable collaboration is between the auction market and the industry. The auction market will be able to sell in large quantities, as the industry will have guarantees over raw material availability. However, this is difficult if there is no help from the government because the auction market managers do not have access to the industry. The government must facilitate business meetings between the auction market managers and the industry. Even if this collaboration happens, there must be a strong commitment between the two parties to avoid violating the agreement. Managers must have strict assessment and rules in order to avoid payment failure by buyers.

Third, collaboration between the auction market and banks, other financial institutions and the private sector. Market participants need funds to carry out their activities in the auction market. However, they face difficulty accessing funds from banks because they do not understand procedures or do not have collateral. Banks can actually conduct cooperation with auction market managers to assess the borrower's track record, particularly the number of products deposited in the auction market (if the borrower is a farmer) or the intention for payment to the auction market (if the prospective borrower is a trader). If the borrower is an auction market, the bank can see turnover for a certain time span (financial flow).

The second potential source of funding is village funds. These funds come are provided by the central government to villages for community economic development. The amount of this fund is IDR 1 billion per village per year. The auction market manager can cooperate with the village government to access these funds. The final source of funds is the private sector, in both investment schemes and corporate social responsibility. However, this can be realized if the auction market has very good economic potential, considering that the private sector is only willing to invest if the business is profitable.

In principle, the auction market must try any potential access to these sources of funds. If they get financial support, this fund must be used to increase auction markets turnover and build facilities to ensure its performance can be optimal.

Finally, there is collaboration between the auction market and the government, both the NACFT and the trade and agriculture offices. The auction market is obliged to send performance reports to the government (information flow). The report usually contains the auction process, the number of members, and the number of products sold along with the selling price. Meanwhile, the NACFT will supervising the auction market by observing the written report and the process in the auction market.

However, the supervision from the NACFT has not been optimal because of the large number of local auction markets in Indonesia. Many market participants continued to broke the rules. Thus, the NACFT shall guide the trade offices in the regency to carry out this task. Even if necessary, this agency should be given the authority to stop the auction process if there are a violation and fraud in the auction market.

The government must also take an active role in helping the development of the quality of human resources for the auction market. Managers have an important role to play in regulating the auction market. Therefore, managers need to receive management training (information flow) in order to understand the processes and services in the auction market so they are managed professionally and be able to overcome various challenges.

Other training relates to use of digital technology, effective promotion, and negotiation. The use of digital technology will improve performance and minimize errors in the auction market. Previous research has shown that delays in adopting digital technology caused the Dutch auction market turnover to plunge. Adoption of digital technology must occur gradually or only at a critical point in the auction. The activity that requires digital technology is recording because it is a critical point in the auction market and has the potential to create conflicts between managers and auction market participants.
Next, the auction market manager need training about promotion. Managers can promote the existence of the auction market, the quantity and price of products formed through the auction process. This is expected to attract the communities, especially buyers, to participate in the auction market. This will make perfect competition model in the auction market. Managers can use various media for promotion, both word-of-mouth and digital media. Finally, negotiation training to ensure that managers can expand market networks and strengthen their bargaining position when conducting cooperation with buyers.

4. Conclusion and recommendation

The agricultural auction market in Indonesia has proven to provide many benefits. For farmers, the auction market is able to sell their products at high prices. The cooperation of farmer groups is also well developed. Meanwhile, consumers can get high-quality products and industry can get raw materials easily. The biggest impacts of the auction market are able to make the agricultural trade system efficient and provide revenue for the government. However, the auction market appears to face several challenges, including lack of stringent rules, a lack of both quantity and quality of human resources, lack of funds and infrastructure, competition with traders, and weak support from other parties. To resolve this challenge, the auction market needs to make a good collaboration with suppliers (farmers and farmer groups), buyers (traders and industries), financial institutions (banks, other financial institutions, and private sector), and the government.

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