

# COOPERATIVE CONTRACTS IN THE AGRICULTURAL SECTOR AND THEIR IMPACT ON THE WORKING TIME ALLOCATION

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**ABSTRACT** – The comprehension of fundamental concepts underlying agricultural cooperatives remains elusive to a significant proportion of farmers despite their extensive daily or even long-term involvement in farm work. This study seeks to investigate the preferences of farmers in the agricultural sector regarding Muzara'ah and Mukabarah cooperation contracts, and their implications for assigned working time. To obtain the essential data, this study adopts a quantitative survey methodology. The quantitative analysis employs the Regression Moderation Analysis (RMA) technique. According to the findings of this survey, the Muzhara'ah contract is the preferred form of cooperation contract among farmers, as it reduces the daily time allotted to cultivating by 3.14 hours. Furthermore, farmers involved in this contract increase their daily working hours by 8.28 hours if they do not face risks such as fertilizer or seed-related risks. Future studies should employ a range of regression procedures to produce divergent results and provide farmers with better guidance.

**Keywords:** Muzhara'ah, Mukabarah, Cooperation Contracts, Agricultural Sector, Work Time Allocation, Regression Moderation Analysis (RMA)

**ABSTRAK – Akad-akad Kerjasama di Sektor Pertanian dan Dampaknya terhadap Alokasi Waktu Kerja.** Meskipun banyak petani yang terlibat dalam kerjasama pertanian sehari-hari dan telah menghabiskan waktu sehari-hari, berminggu-minggu, bahkan bertahun-tahun bekerja di pertanian, masih banyak di antara mereka yang tidak memahami konsep dasar di balik kerjasama pertanian. Oleh karena itu, studi ini bertujuan untuk menyelidiki preferensi petani di sektor pertanian terhadap jenis kontrak kerjasama Muzhara'ah dan Mukabarah serta dampak preferensi tersebut pada efisiensi waktu kerja yang digunakan. Metodologi survei kuantitatif digunakan untuk mengumpulkan data yang dibutuhkan, dan Regresi Moderasi Analisis (RMA) digunakan sebagai teknik analisis. Hasil studi menunjukkan bahwa petani cenderung lebih memilih kontrak Muzhara'ah, karena dapat mengurangi waktu kerja harian yang diperlukan untuk bercocok tanam sebesar 3,14 jam perhari. Selain itu, petani yang terlibat dalam kontrak tersebut cenderung menambah jam kerjanya sebesar 8,28 jam perhari jika tidak menghadapi risiko dalam bentuk pupuk atau bibit. Dalam penelitian selanjutnya, disarankan untuk menggunakan metode regresi yang berbeda untuk memperoleh hasil yang beragam sehingga dapat memberikan rekomendasi yang lebih efektif pada petani untuk memilih jenis kontrak kerjasama yang paling sesuai.

**Kata Kunci:** Muzhara'ah, Mukabarah Kontrak Kerjasama, Sektor Pertanian, Alokasi Waktu Kerja, Regression Moderation Analysis (RMA)

## INTRODUCTION

According to data from the Indonesian Central Statistics Agency, the number of people working in the agricultural sector in Indonesia fluctuates. In 2020, the recorded number of farmers was 88.57, while in 2021, it decreased slightly to 88.43. For 2022, it is projected to increase to 88.89. Although there was a slight increase in the number of farmers last year, it was minimal (Badan Pusat Statistik, 2022).

The decline in the quantity and quality of human resource managers has contributed to the low competitiveness of the agricultural sector, which has been further exacerbated by land tenure issues. As of 2021, the total area of agricultural land in Indonesia was 10.52 million hectares, a decrease of 0.14 million hectares compared to the previous year. This decrease was due to a reduction in the total area of harvested paddy fields (Badan Pusat Statistik, 2021). Such risks beyond a person's control affect their decision to fully engage in economic activity. In particular, farmers must consider various production outcomes when deciding which crops to grow. If they anticipate poor yields or are uncomfortable with uncertainty, they may invest less, resulting in lower production. Import policies also have drawbacks (Tito et al., 2018). Relying too much on other countries for basic products carries significant risks, especially for food security in emerging countries with dense populations such as Indonesia. Domestic rice production must be the basis for food sovereignty and security, given rice's importance in Indonesia. The country has a history of achieving rice self-sufficiency in the 1980s through comprehensive techniques such as crop development, staple food diversification, legislation limiting land conversion, and population control through family planning (Sujarwo et al., 2022).

Food is a basic human necessity, and in addition to its accessibility and cost, it must also be safe. In Indonesia, the average per capita food spend per month is roughly USD 80.29. Nineteen provinces in Indonesia outperform the national average. DKI Jakarta and East Nusa Tenggara have the largest and lowest per capita spending, respectively. Food accounts for 50.65% of total spending per capita, while non-food accounts for 49.35%. The large proportion of food expenditure in comparison to other consumption suggests that the government must improve the safety, quality, and benefits of the food consumed by the population by implementing an appropriate national food control system (Barinda & Ayuningtyas, 2022).



A risk-averse trait means that risk minimization or transfer strategies are important options to ensure the agricultural sector's sustainable contribution. However, relying on risk transfer in profit-sharing financing from formal financial institutions still faces significant obstacles. There is a trade-off between minimizing bad credit and high surveillance costs (as a consequence of the production cycle) in world agriculture. Additionally, the production results obtained by households are limited to a relatively small size. However, for many farmers, the problem lies in their attitude to risk. It is more about their ability to endure it (Gonzalez-Ramirez et al., 2018). Especially for farmers with low asset levels and little or no access to credit and safety nets, risk neglect often results in disaster, including the loss of land or even starvation. Therefore, it must be avoided, even at the expense of opportunities for large profits. In general, an alternative to informal cooperative practices in agriculture (profit sharing) that is implemented and becomes a habit in the community is a cooperation between farmers who own the land and some as cultivators (Banson et al., 2016).

Each landowner who does not have the resources (time and skills to cultivate crops) can leave the management to others with relatively more time who are experts in agriculture (land dwellers). In this case, the concept of allocation rules is formulated to determine the amount of benefit that can be enjoyed by the tenant as limited as the responsibility to allocate investment expenditure, as a form of risk transfer, during the land and agricultural management period (Boyer et al., 2020). Islam recognizes some of these designation rules in cooperation contracts such as muzara'ah and mukhabarah (Kamri, Ramlan, & Ibrahim, 2014). As an initial goal, implementing various types of cooperation contracts with all their consequences will determine the limit of variations in the allocation of time and working capital for farmers (cultivators). Imam Taqiyuddin, in the book "*Kifayatul Ahya*," states that muzara'ah is hiring a worker to cultivate the land with part of the salary that comes out of it. Meanwhile, mukhabarah is a transaction to cultivate land with wages as part of its proceeds. Based on the above definition, it can be concluded that the mukhabarah cooperation agreement already exists (Taqiyuddin, 2016).

Long before that, the Marshallian disciple of thought had argued that sharecroppers as a form of informal risk transfer (without a market mechanism) were inefficient compared to the fixed rent system. However, at least, there is another theoretical exposition of the Marshallian group proposition, namely the monitoring approach pioneered by Johnson (1950) (Tajani et al., 2020). Under



this approach, revenue sharing can be as efficient as a fixed lease as the lessor determines the amount of input the lessee will provide during the contract and then monitors the supply of inputs the lessee wants

## **LITERATURE REVIEW**

### **Variable of Work Time Allocation**

The basic variables of work-time allocation refer to the factors that are considered and adjusted to allocate work time effectively. Some common variables for work-time allocation include: 1) Time - The amount of time available for work, such as weekly or daily hours or specific project deadlines, 2) Availability - An employee's availability, including work schedules, preferred hours, and other commitments, 3) Skillset - An employee's skills, abilities, and areas of expertise, can determine which tasks they are best suited to perform, 4) Workload - The amount and type of work that needs to be done, including project tasks, ongoing responsibilities, and one-off assignments, and 5) Priorities - The priority of tasks and projects, which can help determine the allocation of work time based on importance, urgency, and impact (Kirchberger, 2020; Kohara & Maity, 2021). By considering these variables and adjusting them as needed, organizations can allocate work time effectively and ensure that work is completed efficiently and effectively.

Regarding time allocation, individuals have two options: to work or not to work and enjoy leisure time. Working entails earnings, which increases one's income. Each individual can either work for an hourly rate or use their leisure time for uneconomically viable activities because they do not provide rewards or wages (Suroto, 2019). The use of household labor in rice farming, which can include husbands, wives, children, and other household members, requires a specific amount of time allocation. This allocation is typically determined by the location of work time in farming, where there is a division of work time. This division of work time is connected to the pattern of labor division between male and female workers, which is mutually agreed upon by the two groups (Ibrahim & Kamri, 2016). Rice farming requires several activities to be completed, including land preparation, planting, plant maintenance, fertilizing, controlling, and harvesting. Allocating work time to these activities is necessary (Puspitasari et al., 2021).



## **Risks Aversion**

Risk aversion is a fundamental concept in the farming industry, where farmers allocate different inputs to their farms depending on their risk attitudes. Risk aversion refers to the tendency of a person to avoid taking risks or engaging in uncertain situations (Yanuarti et al., 2019). Farmers tend to avoid taking risks due to the potential loss they face in the event of crop failure, which could result in their family's requirements not being met (Rondhi et al., 2020; Ibrahim, Fitria, & Dianah, 2019). From a producer's perspective, there are two main types of risk in agriculture: yield risk and price risk (Gower et al., 2016). Yield risk is impacted by weather, farmer health, and plant diseases, while price risk arises because agriculture requires production activities for months or even years before the harvest can be sold.

Risk aversion can significantly influence a farmer's decision-making process and farm profitability (Zhao & Yue, 2020). Risk-averse farmers tend to allocate more time and resources to tasks that are less uncertain or have a lower risk of failure, such as crop maintenance or livestock care, rather than investing in new or untested ventures (Yanuarti et al., 2019). Additionally, risk aversion can impact the crops a farmer chooses to grow. For instance, risk-averse farmers may prefer to grow crops that are more predictable and have a higher market demand, such as corn or wheat, rather than riskier, exotic crops that may yield higher profits (Zhao & Yue, 2020).

## **Muzara'ah and Mukhabarah**

Muzara'ah and mukhabarah are two distinct agricultural practices that involve the sharing of profits between the landowner and the manager. Although these practices share many similarities, they also have notable differences. In muzara'ah, the landowner provides the capital for the farming operation, while in mukhabarah, the manager supplies the capital. Despite these differences, both practices have been successful in increasing agricultural productivity and profitability (Ibrahim et al., 2021).

The principles of muzara'ah and mukhabarah have also been applied to the livestock industry, where they have proven to be effective. Livestock owners in farming communities often act as landowners, while those who provide animal care and feed are equivalent to land managers or cultivators. The use of mukhabarah in the livestock industry has led to increased productivity and



profitability, as it allows livestock owners to share the risks and benefits of animal husbandry with their caretakers.

According to Asnawi et al. (2018), the widespread use of mukhabarah in farming communities is evidence of its effectiveness. This practice has allowed farmers to share the risks and rewards of farming with their managers, leading to increased productivity and profits. Overall, the practices of muzara'ah and mukhabarah have proven to be valuable tools for increasing agricultural and livestock productivity and profitability.

## METHODOLOGY

In this study, questionnaires were utilized by the researchers to collect the data. The data was then processed once more in excel format before being processed with Stata utilizing Moderator Regression Analysis (MRA), which produced the study's findings. The steps used in this study are described in Figure 1.

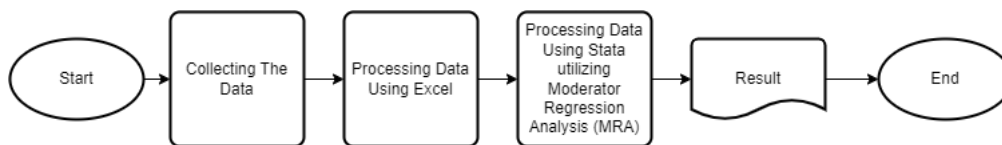


Figure 1. Diagram of Methodology

## Data and Data Collection

In this study, two major groups of food storage areas in Indonesia, namely West Sumatra and Central Java Provinces, were chosen as the research sites. West Sumatra Province was also included as a research sample due to the unique status of *ulayat* land, which dominates agricultural areas in the region. This allowed for a comparison with the differences in community land tenure status in Central Java Province. Non-probability sampling was utilized in this study to determine the respondent sample, as the complete population of rice farmers involved in cooperation agreements with *muzara'ah* and *mukhabarah* in West Sumatra and Central Java could not be determined with certainty. The sample size was determined using accidental sampling technique in the Moe formula (Arikunto, 2013) as follows:

$$n = \frac{Z^2}{4(Moe)^2} \quad n = \frac{1,98^2}{4(0,1)^2} = 98, \text{ rounded up to } 100$$



Based on the calculation above, a sample of 100 farmers will be taken from each location. The sample locations in West Sumatra Province will cover the Solok districts, as they are important food storage and production areas within the province. Meanwhile, in Central Java Province, the respondents' sampling location included the Demak District due to its impressive agricultural productivity rates. Specifically, the paddy productivity in this district reached 101.09%, surpassing the target of 63.22 Ku/Ha, and the agricultural production of the main food crops, including rice, exceeded the goal of 623,477 tons by reaching 102.38%.

### Research Instruments, Indicators, and Variables

The instrument used in this study was a questionnaire. Before the questionnaire is created, determining indicators must be prepared. This questionnaire is based on a modified Likert scale. To create a questionnaire preparation guide, the research team looked for indicators for each variable, then described them as statement items. The statement to be prepared must match the instrument grid.

### Data Analysis

After the data has been collected in quantity and content, the next stage is continued with data analysis to test existing hypotheses. Hypothesis testing in this study was carried out by quantitative analysis using *Moderation Regression Analysis* (MRA). The multiple regression equation in this study can be formulated as follows:

$$Y_i = \beta_0 + \beta_1 D1 X1 + \beta_2 X1 + \beta_1 D1 * \beta_2 X2 \varepsilon_i + e$$

Where  $Y_i$ : Allocation of working time in a week (in hours) for each  $i$  (individual farmer). Meanwhile,  $D1$ : Dummy status of cooperation;  $X2$ : risk aversion as moderation variables.

Table 1. The description of Ordinary Least Square

Variable	Indicator	Information
$Y_i$ : farmer_time	Hour per day	Time is allocated to work in the agricultural sector
Operative Farming	Contract 0= Muzara'ah 1= Mukharabah 2= both types of farmers	Dummy of farmer status in terms of land ownership
Risk aversion level	1=Yes, 0=others 1=Yes, 0= others	There were six responses that could be chosen by farmers, each



1=Yes, 0=others	of which had a value ranging from 0 to 1(Rondhi et al., 2020)
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## RESULT AND DISCUSSION

### Research Results

This study is about cooperation agreements and their role in avoiding the risks that impact farmers' work time allocation in West Sumatra and Central Java provinces. The sample selected consists of 100 rice farmers from Solok Regency in West Sumatra Province and 100 from Demak Regency. In this section, the results of the research calculations are discussed. Firstly, the work contract for risk avoidance and its impact on the farmers' work time allocation in West Sumatra Province is examined. Then, a sensitivity analysis is carried out by analyzing the interaction effect between the cooperation contract variables and risk aversion.

Table 2. Regression Moderation Analysis for Demak Regency

	(1) x1	(2) x2	(3) x3
Muzara'ah	-1,5000** (0.64)	-1,6200** (0.65)	-5,1786*** (1.68)
Mukhabarah	-0,4273 (0.56)	-0,4616 (0.56)	-1,2952 (0.96)
Risk Aversion		0,4446 (0.51)	-0,8132 (0.98)
Muzara'ah interaction with risk aversion			4,2371** (.)
Mukhabarah interaction with risk aversion			1,2799 (1.17)
_cons	4,9000*** (0.48)	4,6110*** (0.58)	5,4286*** (0.79)

The results presented in Table 2 display the estimated coefficients for the MRA regression. The muzara'ah variable has a negative coefficient value of 1.50, which is statistically significant at the \*\*\* level ( $p < 0.001$ ). This finding suggests that the muzara'ah cooperation agreement tends to decrease the time allocation for farming work in Demak Regency by 1.5 hours per day. Similarly, the mukhabarah variable also has a negative coefficient, but it is not statistically significant as indicated by the absence of \* symbols next to the coefficient





values. This means that the mukhabarah contract does not reduce the farmer's time allocation.

Table 2 also presents the estimated regression coefficient for the muzara'ah variable moderated by risk aversion, which has a positive coefficient value of 4.2 and is statistically significant at the \*\*\* level ( $p < 0.001$ ). This finding indicates that farmers who enter into a cooperation contract but still avoid high risks will increase their farming time allocation by 4.2 hours per day. Additionally, the table presents an estimate of the regression coefficient for the mukhabarah variable moderated by risk aversion, which has a positive value of 1.2, but it is not statistically significant ( $p > 0.10$ ) as indicated by the absence of \* symbols next to the coefficient values.

In summary, the study shows that the muzara'ah cooperation agreement reduces the time allocation for farming work, while the mukhabarah contract does not have a significant impact. However, when risk aversion is considered, farmers who enter into a cooperation contract and avoid high risks can increase their farming time allocation.

Tabel 3. Regression Moderation Analysis for Solok Regency

	(1) x1	(2) x2	(3) x3
Muzara'ah	-1,6477*** (0.62)	-1,7278*** (0.63)	-5,1786*** (1.67)
Mukhabarah	-0,4120 (0.52)	-0,4176 (0.52)	-1,2952 (0.96)
Risk Aversion		0,3989 (0.51)	-0,7815 (0.94)
Muzara'ah interaction with risk aversion			(.) 4,0565**
Mukhabarah interaction with risk aversion			(.) 1,2379
_cons	4,8750*** (0.43)	4,5925*** (0.56)	(1.13) 5,4286*** (0.79)

The results in Table 3 present the estimated MRA regression coefficients. Using the muzara'ah variable has a negative coefficient value of 1.64, which is significant, as shown by the \*\*\* (0.001) mark. The value is smaller than 0.05. This finding shows that the muzara'ah cooperation agreement tends to reduce the time allocation for farming work in Solok Regency by 1.64 hours per day.



Cooperation carried out with a muzara'ah contract can reduce the time allocation of farmers by 1.64 hours per day. Furthermore, Table 3 also presents the mukhabarah variable having a negative coefficient, and it is not significant, as evidenced by not being marked \*, \*\*, \*\*\* ( $< 0.10$ ,  $< 0.05$ ,  $< 0.001$ ). This means that the mukhabarah contract carried out by farmers does not reduce the farmer's time allocation.

Furthermore, Table 3 presents the estimated regression coefficient of the muzara'ah variable moderated by risk aversion, which has a positive coefficient value of 4.05 and is significant, as shown by the \*\* mark ( $< 0.05$ ). This finding shows that farmers who enter a cooperation contract but still avoid high risks will increase their farming time allocation by 4.05 hours per day. Finally, Table 3 presents the estimated regression coefficient of the variable mukhabarah moderated by risk aversion. It has a positive coefficient value of 1.23 and is not significant, as evidenced by not being marked \*\*\*, \*\*, \*\*\* ( $0.001$ ,  $< 0.05$ ,  $< 0.10$ ). This finding shows that farmers who enter into a mukhabarah cooperation contract but still avoid high risks will not affect the allocation of farming time in Solok Regency. In addition, it also presents an estimate of the regression coefficient of the mukhabarah variable moderated by risk aversion, which has a positive value of 1.23 and is not significant, as evidenced by not being marked.

## Discussion

According to the findings, farmers prefer to enter into cooperative contracts through the muzara'ah contract. This is because the contract reduces the time farmers allocate to farming. Moreover, farmers who engage in this contract tend to increase their working hours when they do not share risks, such as those related to fertilizers and seeds. Farmers in Solok District, West Sumatra Province, prefer this option over farmers in Demak District, Central Java Province. Although the study's objective is not to compare regions, it does demonstrate that the allocation of farming time in cooperative contracts has a strong association with the willingness to take risks.

In terms of farmers' preferences for cooperative contracts, both the muzara'ah contract and the mukhabarah contract have the potential to describe how their terms affect work-allocating time. If handled properly, both cooperative contract farming methods can efficiently coordinate and enhance productivity in the agricultural sector. However, it is fundamentally a contract between



parties with unequal bargaining power: landowners on one side and economically disadvantaged farmers on the other. Nevertheless, it is a strategy that can lead to improved revenue for farmers and greater profitability for landowners. Contract farming can decrease risk and uncertainty for both parties when arranged and managed well.

When farmers choose contracts without considering the risks involved, their choice can increase the time allocation for farming work. In this context, farmers prefer mukhabarah contracts over muzara'ah contracts. Generally, farmers who self-select into cooperative contracts tend to be more risk averse. In fact, risk aversion is necessary to explain why farmers adopt different types of alternatives.

## CONCLUSION

Based on the aforementioned analysis, several factors incentivize farmers to transfer risks in agricultural management. Specifically, the Muzaraah and Mukhabarah contract models in agriculture have a significant impact on the time allocation for farming activities. Each type of farmer tends to adopt a cooperative model that is most profitable for them. Thus, it can be concluded that tenant farmers, who do not own the land they cultivate, have distinct preferences for cooperative models compared to owner farmers. Additionally, farmers who cultivate other people's land and own land also have varying preferences for cooperative models compared to owner farmers.

The study's findings suggest that both the Muzaraah and Mukhabarah contracts may detail how their conditions affect the time allocated for tasks in farmer preference cooperative contracts. When implemented correctly, cooperative contract farming can be an effective strategy for improving agricultural coordination and output. However, it is important to note that the contract is between landowners on one hand and economically disadvantaged farmers on the other. Nonetheless, it is a strategy that could boost farmers' earnings and landowners' returns when planned and executed properly. Contract farming has the potential to reduce risk and uncertainty for all parties involved.

Farmers' decisions regarding the allocation of work time are influenced by their risk aversion. In particular, farmers tend to opt for mukhabarah contracts over muzhara'ah ones when they prioritize increasing the time allocated for farming activity without considering the risks involved. Farmers who choose to participate in cooperative contracts are typically less willing to take risks.



Indeed, risk aversion is a necessary explanation for farmers' preference for particular cooperative models.

Furthermore, the study reveals that tenant farmers tend to allocate more time for farming when they do not have to bear the risk in an agricultural management collaboration, especially if the collaboration duration is extended. In contrast, both owner and actor farmers who cultivate their own land and others' tend to exercise caution. They agree to share the risk, but for a limited duration of cooperation.

It should be noted that the study may have limited scope and a small sample size in terms of the factors examined or the geographical area covered, which may constrain the ability to draw generalizable conclusions. Future research could use a larger sample size to increase the generalizability of the findings to the larger population of farmers. Additionally, a mixed-methods approach that combines qualitative and quantitative data could provide a more comprehensive understanding of farmers' preferences and their impact on the allocation of work time for risk aversion.

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