

Sharecropping and Production Risk of Rice Farming

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Abstract. Sharecropping is a form of cooperation between landowners and tenants. Two types of sharecropping systems for rice farming in Bone District, South Sulawesi, impact income and production risks. This study aims to (1) analyze the implementation of the sharecropping system and (2) analyze income and production risk. This study used primary data from 117 Berebbo sub-district, Bone district farmers. Data were analyzed using income analysis and production risk. The results showed that the sharecropping system has been implemented traditionally according to customs and is not guided by Law No. 2 of 1960 about the sharecropping system. The sharecropping system has survived to this day because, in addition to improving the economy, it also strengthens farmers' social relations through honesty, trust, and helping each other. There are two types of sharecropping of grain; type 1 is 1:2, and type 2 is 1:1. In type 1, the landowner only provides the land, while in type 2, the landowner provides the land and shares the cost of fertilizers, pesticides, and transportation. The profit of farming using type 2 is higher than type 1, but the risk level of type 2 is also higher than type 1. But the landowner gets a higher profit than tenants because the output distribution is grain without considering farming costs. The output should share the profits to provide justice for both parties. The results of this study can become literature for future researchers to study production risks in sharecropping systems.

Keywords: income; production risk; sharecropping

INTRODUCTION

Sharecropping is an alternative for cooperation between landowners and tenants. Sharecropping systems are implemented in several countries such as Chile, Malaysia, Brazil, Europe, Ghana, Nigeria, Uzbekistan, and Indonesia (Abid & Shafiai, 2017; Baah & Kidido, 2020; De Almeida & Buainain, 2016; Garrido, 2017; Mukhamedova & Pomfret, 2019; Quijada et al., 2022; Sulistyowati et al., 2019; Yahuza & Idris, 2015). The system of land tenure widely used in India is sharecropping, reaching almost 100% in some areas (Deb et al., 2016). In Chile, a sharecropping scheme is implemented to avoid risks due to extreme geographical conditions (Quijada et al., 2022). According to the agreement, the sharecropping system can share revenue, profit, or production results between landowners and tenants (Lelet et al., 2019; Malik et al., 2018). Quijada et al. (2022) found that Chile's sharecropping system uses output sharing in the form of rice. But it is different in the Minahasa Regency Province, Indonesia, the sharecropping system uses revenue in its distribution Lelet et al. (2019).

Implementing a sharecropping system usually involves landowners providing land and tenants providing other inputs (Askar, 2015). A sharecropping scheme is a relationship between landowners who hand over their land to tenants. According to Fahrurrozi (2016) sharecropping is profit and loss sharing. Sharecropping is defined as sharecropping with parties bound in the contract. Sharing not only when obtaining profits but also when facing losses is called a profit and loss sharing agreement. Sharecropping is often associated with dividing production inputs and outputs. Farmers who farm rice often collaborate between landowners and tenants (Arief et al., 2021). Besides rice, corn (Tajidan et al., 2018), shallots (Munfariah & Saka, 2020), soybeans (Susanti et al., 2022), and coffee (Souza & Faleiros, 2022) can also apply a sharecropping system in their farming.

Implemented a sharecropping system which still exists today. Several regions in Indonesia still use a sharecropping system, such as Java (Arief et al., 2022), Lombok (Tajidan et al., 2018), Bone (Munfariah & Saka, 2020), Gowa (Darmawita & Muin, 2016), Aceh (Husin et al., 2022), Sumatera

(Irawan, 2018) and Bali (Suharyanto et al., 2015). The sharecropping system in Indonesia has many names depending on the region. Maro, Mertiga, Martelu, and Merpapat are terms that describe the mechanism of the sharecropping system in various areas in Java. Farmers in Aceh call the sharecropping system Meudua; in West Sumatra, it is called Mampaduokan, Mampatigoi, and so on; in Bali, they are familiarly called Nandu, Telon, Ngemepat-empat, and Ngelima-lima (Auliyah & Wulandari, 2017). South Sulawesi is known as Tesang. The sharecropping in terms of the Dutch East Indies is called Deel Bouw.

The sharecropping system was then regulated in Law Number 2 of 1960. Law Number 2 of 1960 explains that the landowner and tenant must make all sharecropping agreements in writing before the Village Head, witnessed by two people each from the landowner and tenant, and approval is required from the sub-district head concerned. However, implementing the sharecropping system in Indonesia does not follow statutory law but is based on community custom (Auliyah & Wulandari 2017; Novita *et al.* 2017; Musdalifah *et al.* 2021). This is due to farmers' desire to ease the agreement's implementation.

The phenomenon of sharecropping is a mutually beneficial arrangement between the landowner and the tenant. There are several reasons for choosing a sharecropping system in agriculture. From the point of view of the landowner, the sharecropping system is used because (1) the landowner owns the land but does not have the time to cultivate it, (2) there is a concern to help tenants in providing land and half production costs, and (3) the desire to share production risks avoid significant losses. As for tenants, a sharecropping system is implemented because (1) tenants have farming skills but do not have a large land and capital, (2) tenants want to expand their farming land and increase farming income and (3) there is a concern for tenants to help landowner who too

old to cultivate the land (Auliyah & Wulandari, 2017).

Many studies have discussed the sharecropping system. However, apart from that, a land lease system is also commonly used in non-owned land management. A land lease is a system in which the landowner temporarily leases his land rights to tenants based on the agreement of both parties. In the leasing system, the landowner receives a fixed amount from the tenant, while the lessee has the right to use the land without interference from the landowner fully. Thus, the lessee bears the risk of failure or profit (Hardono et al., 2016). Research conducted by Stiglitz (1973) explains that in the land lease system, all risks will be borne by the lessee, whereas if using the wage system, the landowner bears the risks. However, this differs from the sharecropping system, which divides the risk between the landowner and tenants, thereby reducing losses for both parties (Malik et al., 2018; Muhandi, 2010).

Based on several previous studies, the land lease system creates economic problems for tenants. The main problem arising from using of the land lease system is the low socio-economic equity which significantly impacts the welfare of tenants (Daedlow et al., 2018; Rao, 2019). In addition, information asymmetry is common in land leasing practices, both from landowners and tenants (Utomo & Wulandari, 2020). This creates injustice for the parties involved. Landowners and tenants must know with certainty about the condition of the land and the benefits and risks that will be borne.

Conversely, an objective and rational sharecropping mechanism can create justice between landowners and tenants. Both parties share the risk and receive the results according to the agreement (Arief, 2020). In line with research (Mukhamedova & Pomfret, 2019), sharecropping schemes can solve sharing risks in agriculture.

Apart from managing farming risks, sharecropping schemes also play a role in overcoming land problems in Indonesia. Based on BPS data, around 59% of rice farming households in Indonesia fall into the small land category of <0.5 ha, while only 0.3% own land area of >10 ha. South Sulawesi is one of the largest rice producers in Indonesia, but around 50% of its farmers own <0.5 ha of land (BPS, 2018). This is due to annual population growth. Based on BPS data, Indonesia's population will reach 275.77 million in 2022, growing by 1.17% from 2021 (BPS, 2022a). The increase in the population increased the demand for land, so the function of agricultural land is converted into non-agricultural land. The decreasing availability of land causes land prices to increase. Meanwhile, few landowner do not want to sell their land, resulting in unequal landownership of agricultural land. If implemented transparently and fairly, the sharecropping system is the most appropriate choice to overcome inequality in paddy fields.

The sharecropping system has a different sharing scheme according to region. Particularly in South Sulawesi, the type of sharecropping consists of three forms, the first form, tenants providing all production inputs; the second form, tenants and landowner jointly bearing input costs; and the third form, all of production input costs being borne by the landowner (Darmawita & Muin, 2016). These differences impact differences in costs and benefits that will be obtained as well as the level of risk taken.

Based on this description, it is necessary to study the sharecropping system, differences in production, income, and the risk level of rice production for each type of sharecropping.

METHODS

This research was conducted from January to March 2022 in Barebbo District, Bone Regency, South Sulawesi. Based on BPS data, Bone Regency is the largest rice producer in

South Sulawesi and occupies the first position outside Java Island. In 2020 Bone Regency succeeded in producing 771.45 thousand tons of rice-GKG, increasing to 802.28 thousand tons-GKG in 2021 (BPS 2022). Research location was determined purposively where Barebbo District is one of the areas with the highest rice productivity. Most farmers use a sharecropping system to cultivate land. There are 2 types of sharecropping, namely Type 1 (1:2) and type 2 (1:1). The ratio is determined based on the capital proportion. Respondents used in this study amounted to 117, 37 landowners, and 80 tenants. Type 1 tenants are 65, and type 2 are 15. The selection of respondents used the snowball sampling method due to the unavailability of farmer population data based on the type of sharecropping.

The research method used is qualitative and quantitative. The first aim is to use a qualitative approach to fully describe the meaning of the social reality in the field. With a qualitative approach, the researcher explores the experience of the respondents as a whole, analyzing various aspects of the sharecropping agreement, such as the place where the sharecropping agreement is implemented (place), the actors behind the sharecropping agreement (actor), and the activities of the actors in the sharecropping agreement (activities). The second goal is analyzed using income analysis and the coefficient of variation to determine the level of production risk according to the type of sharecropping. A larger coefficient of variation means that the chance of a risk occurring on a farm is more incredible than on other farms.

Farming Income Analysis

Farming income was analyzed using income analysis and R/C Ratio.

$$I = TR - TC \quad (1)$$

$$R/C \text{ ratio} = TR/TC \quad (2)$$

Where :

$$I = \text{Income (Rp)}$$

TR = Total Revenue (Rp)

TC = Total Cost (Rp)

R/C ratio = farming feasibility

R/C Ratio assessment criteria:

1. If the value of the R/C Ratio > 1 , then the business is feasible to develop
2. If the value of the R/C Ratio = 1, then the business is said to break even
3. If the value of the R/C Ratio < 1 , then the business is not feasible to develop

Production Risk Analysis

Production risk is calculated using rice production data for each type of sharecropping. Production data is grouped into 2 categories, type 1 and type 2. Then the analysis is carried out with the following steps:

1. Calculating the amount of production risk using the range and standard deviation

Variance

$$V^2 = \frac{\sum(X-\bar{X})^2}{n} \quad (3)$$

Standard deviation

$$V = \sqrt{V^2} \quad (4)$$

2. To choose the alternative that provides the least risk, can use the coefficient of variation (CV) and the lower production limit (L).

Coefficient of variation

$$CV = \frac{V}{\bar{X}} \quad (5)$$

The lower limit of production

$$L = \bar{X} - 2V \quad (6)$$

Where:

CV : Coefficient of variation

V^2 : Variance

V : Standard deviation

X : Productivity (ton.ha⁻¹)

\bar{X} : Average productivity (ton.ha⁻¹)

n : Sample totals

The CV value is directly proportional to the risk, meaning that a more considerable CV value gives a higher risk. The lower limit (L) shows the lowest production nominal that

farmers can produce. The criteria for the relationship between risk and profit are if the $CV > 0.5$, then the $L < 0$; if the $CV < 0.5$, then the $L > 0$. Indicates that if the $CV < 0.5$ or $L > 0$, then farmers avoid losses due to risk. Conversely, if $CV > 0.5$ and $L < 0$, farmers can get losses due to risks. Meanwhile, if $CV = 0$ and $L = 0$, the farmer will break even with no loss or profit.

RESULTS AND DISCUSSION

Implementation of Sharecropping Agreement

The sharecropping system in South Sulawesi is called Tesang. Tesang Sawah is the oldest collaboration in agriculture for rice cultivation. The sharecropping system, especially in Bone Regency, South Sulawesi, is based on customs and habits as local wisdom passed down from generation to generation. The agreement process in the sharecropping system discusses several matters, such as the rights and obligations of landowners and tenants, inputs and outputs that will be borne and obtained, the period of the agreement, and the type of sharecropping used. Mauliyanti (2020) explains that tenants get a higher ratio if they incur more costs than the landowner. The output divided can be paddy, grain (Malik et al., 2018), rice (Ginting et al., 2017) or money (Lelet et al., 2019). The form of output obtained at the location is grain in sacks. Bawohan et al., (2021) explain that sharing in sharecropping is not calculated based on the paddy yield but is calculated and divided based on the sacks produced.

The sharecropping agreement in Barebbo District, Bone Regency, was carried out verbally without witnesses. The deal is only marked with the word "agreed" from both parties. This verbal agreement is still widely applied in other areas, such as in Brebes (Iko, 2008), Tana Toraja (Sugeng et al., 2021), North Langowan (Bawohan et al., 2021) and Sidorajo (Auliyah & Wulandari, 2017). Research from

Auliyah and Wulandari (2017) explains that a sharecropping system is verbally implemented because no rules in society require making a written agreement. According to the respondents, both parties did not want to complicate the agreement process, so they agreed verbally. Indicates that the sharecropping system in Barebbo District, Bone Regency, is based on the traditions or customs that have become a local culture and do not follow the regulations in Law no. 2 of 1960.

Verbal agreements are based on trust between the parties involved. The honesty of tenants to landowners and vice versa builds trust between them so that they do not need written evidence. Honesty creates transparency, thereby avoiding information asymmetry (Kemper et al., 2018; Mukhamedova & Pomfret, 2019). Trust, honesty, and concern for helping each other are the social assets of the sharecropping system that strengthen the relationship between the two so that the sharecropping system still exists today. Implementing sharecropping improves the economy and increases solidarity in society. However, it is not uncommon for landowners who do not trust tenants. Landowners and tenants carry out sharecropping agreements due to conditions that require each other. Landowners need tenants to cultivate their land because landowners do not have time to cultivate it themselves. Tenants need land from the landowner because they do not have land. Landowners, as the owner of land as large capital, can determine the ratio of the distribution of production output. This can cause injustice to tenants. However, tenants still continue to use a sharecropping system because they need land to meet their daily needs.

There are 2 types of sharecropping in Barebbo District, type 1 (1:2) and type 2 (1:1). The distribution ratio is determined based on mutual agreement. In type 1, the cultivator gets 2/3 of the share, and the landowner gets 1/3 of

the share. Based on research conducted for type 1, all production input costs are borne by tenants, while landowners are just waiting for the results. That is in line with the results of interviews, which show that tenants bear almost all of the production inputs so that they get two parts, while the landowner only gets 1 part. The inputs borne by cultivators are seeds, fertilizers, pesticides, tractors, combiners, and part of grain transportation. Using inappropriate inputs can cause a decrease in production which is a risk in agriculture. In addition, production risks can also come from pests, diseases, and uncertain climates. The sharecropping system is used to expand cultivated land and avoid losses due to risks in rice cultivation. Citing the results of previous research increasing land area can reduce the risk of rice production (Prihtanti, 2014; Wadu et al., 2019; Zakirin et al., 2013). Farmers with large land areas will be careful in managing their farming. As for type 2, production inputs are shared. In contrast to type 1 tenants, who have land and capital for farming, type 2 tenants only have a little capital but do not own land, so they cannot cover all input costs. Production inputs are jointly borne in this type, but the distribution of inputs and outputs depends on the landowner. This is supported by a study from Pi (2013) which states that type 2 is a type that varies, especially in the inputs provided by both parties. The number of incentives received does not follow variations in the distribution of inputs. Tenants who use type 2 will always get ½ of the production output regardless of the input that has been provided. Tenants feel this as a form of injustice, so only a few use type 2.

Differences in Income in Rice Farming Based on the type of Sharecropping system

Type 1 and type 2 have differences in production, revenue, and profit. This difference is due to differences in the availability of farming capital. Table 1 explains the different

types of sharecropping between type 1 (1:2) and type 2 (1:1).

Table 1. Average cost per ha by type of sharecropping in Barebbo sub-district, Bone district, 2022

No	Biaya Usahatani	Types of Sharecropping									
		Type 1				Type 2					
		PG (65 sample)	%	PL (30 sample)	%	Total	PG (15 sample)	%	PL (7 sample)	%	Total
1	Variable cost (Rp thousand)										
	a. Seed	878	100	-	0	878	1.333	100	-	0	1.333
	b. Urea	582	100	-	0	582	298	50	298	50	595
	c. Ponska	1.210	100	-	0	1.210	564	50	564	50	1.127
	d. Pesticides	1.545	100	-	0	1.545	797	50	797	50	1.594
	e. Other cost										
	Tractor	861	100	-	0	861	959	100	-	0	959
	Combain	1.969	100	-	0	1.969	2.229	100	-	0	2.229
	Transportation	524	50	523	50	1.048	674	50	674	50	1.348
	TVC (Rp thousand)	7.568	94	524	6	8.092	6.853	75	2.332	25	9.186
2	Fixed Cost (Rp thousand)										
	a. Land tax	-	0	21	100	21	-	0	21	100	21
	b. Equipment depreciation	1.177	100	-	0	1.177	1.176	100	-	0	1.176
	TFC (Rp thousand)	1.177	98	21	2	1.197	1.176	98	21	2	1.196
3	Total cost (TVC + TFC)	8.744	94	545	6	9.289	6.788	77	2.027	23	8.815

Source: Primary data processed (2022)

Note: PG = Tenant; PL = Landowner

Based on table 1, the total costs paid by type 1 tenants amount to Rp. 8,744,314 are greater than type 2 tenants who paid a total cost of Rp. 6,788,040. That is because type 1 tenants bear more production costs, including seeds, urea fertilizer, ponska fertilizer, pesticides, tractors, combine cars, grain transportation costs, and other equipment. Whereas in type 2, production costs are shared with the landowner. Tenant costs include the cost of seeds, urea and ponska fertilizers, pesticides, tractors, combine cars, grain transportation costs, and other equipment. In both types of sharecropping, the cost of the combined car is borne jointly by the landowner and tenant in the form of sacks, 10 sacks of rice come out of 1 sack for the cost of the combined car. In types 1 and 2, landowners incur fewer

costs than tenants because they only bear a small proportion of production inputs and land taxes. Based on the costs incurred, there is a difference in the income received by the landowner and the cultivator. Revenue earned by both of them can be seen in Table 2.

Type 1 gives 2/3 production output to the tenant and 1/3 to the landowner. Based on the analysis, the landowner and the tenant obtained the grain according to the agreement. In type 1, the tenant gets 66% and the landowner 34% of the total production, while in type 2, the tenant and landowner get an equal output of 50% of the total production. The average production of farms using type 1, which is 5 tons is slightly smaller than that of type 2, which produces 5.4 tons of grain. The price of grain/kg is Rp. 4,100, so the revenue of type 1 tenant farmers

is Rp. 13,335,050, and type 2 tenants are Rp. 11,218,869. The average profit of farming

based on the type of sharecropping can be seen in Table 3.

Table 2. Average production and revenue of rice farming per ha by types of sharecropping in Barebbo sub-district, Bone district, 2022

No	Description	Type 1			Type 2		
		Tenant	Landowner	Total	Tenant	Landowner	Total
1	Average production (ton)	3	2	5	2,7	2,7	5,4
2	Grain price/kg	Rp 4.100	Rp 4.100	Rp 4.100	Rp 4.100	Rp 4.100	Rp 4.100
3	Total revenue (Rp)	13.335.050	6.667.525	20.002.575	11.218.869	11.218.869	22.437.738

Source: Primary data processed (2022)

Table 3. Average profit and R/C ratio of rice farming per ha by type of sharecropping in Barebbo sub-district, Bone district, 2022

No	Description	Type 1					Type 2				
		PG	%	PL	%	Total	PG	%	PL	%	Total
1	Production (ton)	3	60	2	40	5	2,7	50	2,7	50	5,4
2	Revenue (Rp thousand)	13.335	67	6.668	33	20.003	11.219	50	11.219	50	22.438
3	Total cost (Rp thousand)	8.745	94	545	6	9.289	6.788	77	2.027	23	8.815
4	Profit (Rp thousand)	4.590	43	6.123	57	10.713	4.460	33	9.221	67	13.680
5	R/C Ratio	1,5				2,2	1,7				2,5

Source: Primary data processed (2022)

Type 2 received more revenue than type 1. When viewed from the actors, in type 1, tenants get more revenue than landowners, 67% of the total revenue. In comparison, type 2 tenants only get 50% of the revenue. However, if based on the profit obtained, landowners get more profit than tenants. Type 1 landowners get a profit of 57%, while type 2 landowners get more profit of 67%. Lelet *et al.* (2019) stated that landowners get higher profits than tenants because of the small production costs the landowner pays. Tenants spend many production costs, even though the tenants provide almost all production inputs. In the grain production sharing system, the cost contribution is not considered because the grain output is divided into sacks. Thus, actors who spend many costs get little profit.

Risk Level of Rice Farming Based on Sharecropping Type

Rice is one of the high-risk crops. Cultivated outdoors, rice is highly resistant to pests and climatic conditions (Suryana *et al.*, 2009). The risks experienced by farmers come from the use of unsuitable production inputs, pest and disease attacks, and uncertain climates. This is according to what happened in the field. Rice farming in Barebbo Subdistrict is inseparable from rat and leafhopper attacks that often destroy crops. Farmers also face problems in the availability of production inputs such as fertilizers and pesticides unavailable on time. The increasing price of pesticides also causes inappropriate use of production inputs. In rice farming in Barebbo District, farmers often use chemical pesticides to control pest attacks. Situmorang *et al.* (2021) explains that chemical pesticides are more effective than natural pesticides, but the continuous use of chemical pesticides can damage the environment. Farmers must start

farming without chemical pesticides. According to research from (Sutarni & Fitri, 2023) agriculture without chemical pesticides can guarantee environmental sustainability and has good development prospects.

The sharecropping system is one of the solutions for farmers to share the risks that may occur. The output obtained will be shared

following the agreed ratio so that the loss due to risk will be borne together. The difference in the type of sharecropping between type 1 (1:3) and type 2 (1:2) is due to the difference in the capital spent. It can affect the level of risk that the tenant will bear. The risk value of rice production based on the type of sharecropping can be seen in Table 4.

Table 4. Production risk per hectare of rice farming by type of sharecropping, 2022

	Type 1	Type 2
Variance (σ)	2,6	3,7
Standard deviation (V)	1,6	1,9
Coefficient of variation (CV)	0,33	0,36
Lowest productivity/L (ton.ha ⁻¹)	1,6	1,5
Average production/ha	5	5,4

Source: Primary data processed (2022)

A smaller coefficient of variation indicates low variability in the mean value of the distribution. The smaller the coefficient of variation, the lower the level of risk faced (Dewi, 2017). Based on the analysis done in this study, the value of the coefficient of variation of types 1 and 2 is 0.33 and 0.36, which means $CV \leq 0.5$ or $L \geq 0$. Indicates that farmers are protected from risks in implementing the rice farming profit-sharing system. The coefficient of variation of type 1 is smaller than that of type 2, which means that the level of production risk of type 1 is smaller than that of type 2. The coefficient of variation in type 1 is 0.33, meaning that the chance of reduced production encountered by type 1 farmers is 33% due to climate change, pest and disease attacks, and inappropriate production inputs. The lower limit (L) or lowest possible productivity is 1.6 ton.ha⁻¹. The coefficient of variation <50% indicates that type 1 farmers' risk level is relatively low. This is because the risks from climate, pests, and diseases and the use of production inputs can still be handled. The production risk level of type 2 farmers is slightly higher than that of type 1 farmers at 0.36, which means that the chance of reduced production is 36%. However, the coefficient of

variation in type 2 is also still <50%, so the risk that may occur is relatively low, with the lowest possible productivity of 1.5 tons/ha.

CONCLUSION

Based on the research results, implementing the sharecropping system in the Barebbo sub-district is based on a long tradition of not following the laws and regulations. The sharecropping system has helped the tenant's economy and created social bonds in the farming community. The sharecropping system still exists today and has become inherited local wisdom. One of the weaknesses of profit sharing is the dominance of landowners. The government must make regulations that provide justice to tenants. Type 2 earns more profit than type 1, but the risk level of type 2 is also higher than type 1. Based on the parties involved, the landowner gets a higher profit because the output distribution is grain without considering farming costs. The output should share the profits to provide justice for both parties. The results of this study can also become literature for future researchers to study production risks in sharecropping systems.

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