Warehouse receipt system and food security: factors that influenced farmers’ decisions

Mahyuddin¹, N Armita¹, R Darma¹, I Summase¹, I M Fahmid¹, A Sulili, I T Syah² and Anwar³

¹Agribusiness Study Program, Department of Socio-Economic of Agriculture, Faculty of Agriculture, Hasanuddin University
²Universitas Sulawesi Barat, Indonesia
³Study Program of Agribusiness, Faculty of Agriculture, University of Mataram

E-mail: mahyuddinr@yahoo.com

Abstract. The Warehouse Receipt System (WRS) aims to increase commodity selling prices through sales delays and financing. Credit with stored production collateral is used to meet the needs of farmers in facing the next crop season. The research objective is to find out what factors influence farmers’ decisions in utilizing WRS. The research method is a survey with 18 respondents or 50 percent of farmers who use WRS. Data were analyzed by logistic regression. The results showed that the factors that significantly influenced farmers’ decisions to use WRS were the distance from the warehouse to farming and the costs associated with using WRS as an external factor. WRS needs to be supported by WRS cost subsidies as a WRS capitalization process in the agricultural sector.

1. Introduction

The Warehouse Receipt System (WRS) is one of the instruments to increase the selling price of commodities through delayed sales and obtaining credit with collateral stored agricultural products [1]. WRS is an effort to regulate supply adjusted to demand, so prices are not low and tend to be stable. The availability of food stocks and stable prices affects food security.

Great Harvest is a time when production is abundant, and prices tend to below. Abundant yields cause farmers are often faced with the problem of falling rice prices. Farmers are in a bargaining position and forced to sell their production. To get the best price, farmers are required to hold or save the harvest and sell it later when the price has improved. But farmers are faced with the necessities of family life and farming in the next planting season [2]. Food policy in the national agricultural development system is not in favor of farmers, as evidenced by the paradox of productivity [3]. Increased agricultural production is not offset by an increase in demand for agricultural products.

In 2006, the Indonesian House of Representatives, with the initiation of the government, passed Law No. 9 of 2006 concerning the Warehouse Receipt System (WRS), which was later amended to become Law No. 9 of 2011 [4]. This law was later supported by Government Regulation Number 36 of 2007, which was later refined to Government Regulation Number 70 of 2013 concerning the implementation of the Warehouse Receipt Act. Warehouse Receipt System is an activity related to the issuance, transfer, guarantee, and completion of a Warehouse Receipt transaction. This WRS can strengthen farmers' bargaining power and create efficiency in the agribusiness world, where farmers...
can delay sales after harvest, while waiting for prices to improve, by storing in certain warehouses that meet the requirements. There are several factors that influence farmers' decisions in implementing the Warehouse Receipt System (WRS), which are divided into internal and external factors. Internal factors or factors within farmers that are the focus of the author are the distance of the warehouse from the farmer's land, land area, farming experience, and level of education, while the external factors are in the utilization of the Warehouse Receipt System (WRS) are based on a study of warehouse receipt utilization in 2008 trade, which is conducted by the Center for Domestic Trade Research and Development, the Ministry of Trade in collaboration with PT ACG Consultants, determines factors such as commodity prices, warehouse facilities, and infrastructure, WRS related costs and government support to influence farmers' decisions to utilize the Warehouse Receipt System (WRS).

Gowa Regency is one of the warehouse receipt development areas in Indonesia. In fact, only a few rice farmers participated in implementing the Warehouse Receipt System, which only consisted of 18 people. The interest of the farming community in implementing the Warehouse Receipt System is still relatively low. The mindset of the peasants who are still reluctant to do business on commodities produced at the time of the big harvest and the procedures carried out in the WRS, which are still considered draining energy, time, and expense. Based on the description above, this study seeks to determine the factors that influence farmers' decisions in utilizing SRG.

2. Methods
The location of this research is in the District of Bontonompo, Gowa Regency, South Sulawesi Province. The location selection was made deliberately with the consideration that Gowa Regency is one of the areas for developing the Warehouse Receipt System (SRG). This research was conducted from March to May 2019.

The population in this study were all farmers who used the Warehouse Receipt System (WRS) and farmers who did not utilize the Warehouse Receipt System (WRS). The determination of the sample is done by proportional random sampling. The total sample of 36 farmers in which the population of farmers who use the Warehouse Receipt System (WRS) is 18 people and the sample of farmers who do not use the Warehouse Receipt System is 18 people. There are several informants who support the results of this study.

Data analysis is an advanced stage after data collection. Data analysis is intended so that data that has been collected can provide useful information. Analysis of the data used is logistic regression analysis and scoring technique with a Likert scale.

2.1. Logistic regression analysis
The analysis used to determine the factors that influence farmers' decisions to use the Warehouse Receipt System (WRS) is a logistic regression analysis. The logistic regression model equation is as follows [5]:

$$\text{Logit} \left( \frac{\pi}{1-\pi} \right) = Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \ldots + \varepsilon$$  \hspace{1cm} (1)

Note:
- **Y** = Farmer's decision to use the Warehouse Receipt System (WRS)
  - **Y = 1**, if farmers utilize a warehouse receipt system
  - **Y = 0**, if farmers did not utilize warehouse receipt system
- **\( \alpha \)** = Constant
- **\( \beta_{1-2} \)** = Regression Coefficient
- **X** = Factors thought to influence farmers using the Warehouse Receipt System.
2.2. Scoring Technique with a Likert Scale

To determine the level of importance of external factors of farmers in utilizing the Warehouse Receipt System (SRG) with a scoring technique using a Likert scale which:

1 = Not Important
2 = Not Too Important
3 = Quite Important
4 = Important
5 = Very Important

3. Results and discussion

3.1. Farmers’ identity overview

Research respondents classified as productive age are aged 15-55 years. In this study, it is known that respondents who are in productive age have a percentage of 94.45% for farmers who use WRS and 83.33% for non-WRS farmers. The average education level of farmers who use WRS and non-WRS farmers is senior high school, with a percentage of 55.56% and 50.00%. The average number of dependents of farming families who use WRS is 2-5 people (77.78%), and the average number of dependents of non-WRS farming families is 4-5 people (50.00%). Farmers who use WRS have an average of 15-36 years of farming experience (77.78%), while non-WRS farmers for more than 37 years (38.89%), and the average area of land owned by farmers who use WRS and non-WRS farmers covering 0.1-0.5 ha.

3.2. Profile of warehouse receipt system in Gowa regency

Gowa Regency is one of the selected and trusted regions in implementing the Warehouse Receipt System. The warehouse, which was used as a WRS warehouse, was established in 2009 and received the first permit in 2014 and issued as many as four warehouse receipts, valued at Rp. 115,431,000. The Warehouse Receipt System in Gowa Regency was not running due to the absence of appropriate managers in managing WRS warehouses until finally, in April 2018, the warehouse manager agreed to cooperate with the Bontolempangan Cooperative in managing SRG in Gowa Regency.

WRS warehouse is located in Barembeng Village, Bontonompo District, Gowa Regency. WRS warehouse in Gowa Regency is a warehouse owned by the Regional Government of Gowa Regency. In its implementation, the WRS warehouse was used as a warehouse to store grain, rice, and corn commodities managed by the Bontolemoangan Farmers Cooperative warehouse manager. SRG warehouse in Gowa Regency is classified as grade A, with an area of 700 m2 and a capacity of 1500 tons.

3.3. Importance of External Factors Farmers Respondents in Considering Using the Warehouse Receipt System (WRS)

The importance of external factors for respondent farmers in considering utilizing the Warehouse Receipt System (WRS) is known for administering questionnaires and scoring techniques using a Likert scale. Total scoring details can be seen in table 1:

| No | External Factors                          | Total Score |
|----|------------------------------------------|-------------|
| 1  | Commodity Prices (X1)                     | 452         |
| 2  | Warehouse Facilities and Infrastructure (X2) | 442         |
| 3  | WRS Related Costs (X3)                    | 500         |
| 4  | Government Support (X4)                   | 476         |
Table 1 shows the scores distribution level of importance of external factors in the implementation of the Warehouse Receipt System (WRS) in Bontonompo District, Gowa Regency. Where the total score of commodity price factors is 452. The total score of warehouse facilities and infrastructure factors is 442. The total score of cost factors related to warehouse receipts is 500. And the total score of government support is 476. This shows that all factors are important enough to be considered by respondent farmers to decide to use the Receipt System (SRG) in Gowa Regency, but based on research, the largest score is obtained cost factors related to warehouse receipts which mean, cost factors related to warehouse receipts are the most important considerations of respondent farmers in deciding to use the Warehouse Receipt System (SRG) in Gowa Regency.

3.4. Logistic Regression Analysis Results on Factors that Influence Farmers’ Decisions in Utilizing the Warehouse Receipt System

Respondents in conducting their farming are faced with choices in utilizing the Warehouse Receipt System (WRS) and not utilizing the Warehouse Receipt System (WRS). To decide this, the respondent is influenced by their own background. In this study, the factors that influence respondents in choosing to use the Warehouse Receipt System (WRS) are analyzed by logistic regression analysis, where the response variables are categorized as Y = 0 (respondents do not utilize WRS) and Y = 1 (respondents use WRS). For more details, can be seen in Table 2 below.

| Variable                  | Coef(B) | SE Coef | Sig(P) |
|---------------------------|---------|---------|--------|
| Constant                  | 2.982   | 3.753   | 0.427  |
| Warehouse Distance (X1)   | -0.006  | 0.003   | 0.014  |
| Land Area (X2)            | 3.928   | 2.025   | 0.052  |
| Farming Experience (X3)   | -0.084  | 0.058   | 0.151  |
| Level of Education (X4)   | 0.121   | 0.317   | 0.702  |

Omnibus test of model sig = 0.003  
R Square = 0.486

Based on the table, it can be seen that the sig omnibus test of the model shows the number 0.003 or is below alpha (0.05). This shows that there is at least one variable explained in the logistic regression model affecting Y. R Square value of 0.486 or 48%. This means, simultaneously, the variables measured in this logistic regression model have an effect of 48%, while the other 52% are influenced or explained by variables not explained in this study. Based on the results of the logistic regression analysis, partially found that the distance of the warehouse variables that influence the decision to use the Warehouse Receipt System (WRS).

The warehouse distance variable (with a value of p = 0.014) is smaller than the alpha value of 0.05, meaning that the warehouse distance variable has a significant effect on the decision to choose to use a warehouse receipt. The warehouse distance variable has a negative coefficient (-0.006). This has the understanding that the further the warehouse is from farmers’ land, the farmers will tend to choose not to use the Warehouse Receipt System (SRG).

4. Conclusion

Based on the description of the results and discussion of this study, it can be concluded that the warehouse distance variable has a significant negative effect on the opportunities of farmers in utilizing the Warehouse Receipt System. However, the cost factor related to warehouse receipts is quite important to consider in making decisions using the Warehouse Receipt System (WRS).
References

[1] Nugraha P A 2014 *Respons Petani Terhadap Sistem Resi Gudang di Kabupaten Bantul* (Yogyakarta)

[2] Sugiono A 2014 *Pengaruh Sistem Resi Gudang terhadap Pendapatan Usahatani Padi di Kecamatan Perak Kabupaten Jombang.* (Bogor)

[3] Saragih B 2000 *Agrabisnis Sebagai Landasan Pembangunan Ekonomi Indonesia dalam Era Millenium Baru* (Bogor)

[4] Indonesia P 2011 *Undang-Undang Republik Indonesia Nomor 9 Tahun 2011 tentang Sistem Resi Gudang. Lembaran RI Tahun 2011 No. 9. Jakarta : Sekretariat Negara.*

[5] Juanda B 2009 *Ekonometrika Permodelan dan Pendugaan* (Bogor: IPB Press)