

Utilisation of warehouse receipt system as a national food reserve instrument

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Abstract. The warehouse receipt system (WRS) is an instrument for sales delay and financing systems, but it can be essential for developing and strengthening a national food reserve system. This study aims to analyse the performance of the WRS in Indonesia and the role of the WRS as a legal instrument in strengthening the national food reserve system. This study was conducted in 2022, using secondary data from various agencies. The analysis was carried out through a qualitative and descriptive approach. The research results show that WRS in Indonesia has developed relatively slowly. Its functions as delay sales and financing instruments have been negligible, including its limited number, volume, and values of commodities stored in the warehouses, the number of receipts issued, and the total value of financing it disbursed. Until now, the WRS in Indonesia has not been able to act as an instrument for building national food reserves. This study provides some policy recommendations, as follows: (i) the need to fulfil the adequacy conditions for the WRS and (ii) the need to revise Law No. 9/2011 of WRS by adding an article regarding the need for the WRS Council as an inter-Ministerial institution.

1 Introduction

The warehouse receipt system (WRS), according to Law No. 9 of 2006, is an activity related to the issuance, transfer, guarantee, and settlement of warehouse receipt (WR) transactions. Meanwhile, the warehouse receipt itself is a document that serves as proof of ownership of commodities stored in the WRS warehouse and is issued by the warehouse manager [1].

The warehouse receipt system as a postponed sales system began to be implemented in Indonesia in 2008 to avoid farmers' losses due to instability in agricultural product prices, functioning as a source of financing, and being able to be traded in an auction system [2]. Seasonal and perishable characteristics of agricultural products cause agricultural commodity prices to fluctuate, encouraging the government to implement WRS. Another justification for

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the need for WRS is the problem of farmers in Indonesia with small landholdings not having access to marketing and financing.

WRS implementation is expected to empower farmers by boosting their income and bargaining power. It will also incentivise them to produce higher-quality crops by facilitating access to financing and knowledge and skills in information technology and agricultural digitalisation. Additionally, WRS aims to streamline agricultural trade by reducing unnecessary government intervention [3,4]. WRS is an official and registered instrument, so it can reduce transaction costs and increase domestic and regional market capacity.

Regarding national food reserves, WRS warehouses can function as an instrument for community food reserves (CPM), where farmers can store their harvests in WRS warehouses when production is abundant. Thus, apart from storing harvests and postponing selling them to get a reasonable price, the WRS warehouse can also function as a community food reserve. The existence of CPM will reduce the negative impact of price fluctuations due to internal and external shocks.

Introduced in Indonesia in 2006 as a new financing system, WRS has struggled to gain traction due to a lack of awareness and understanding among stakeholders [5,6]. However, WRS has limitations. It only applies to specific commodities, and traders are the primary users. Additionally, the system faces a shortage of warehouses and limited support from local governments [7]. In some areas, WRS warehouses are empty or underutilised, and staff shortages further hinder efficient operations [7,8].

In connection with this background, the objectives of this study are (1) to analyse the performance of the warehouse receipt system in Indonesia and (2) to analyse the role of the warehouse receipt system as a legal instrument in strengthening the national food reserve system.

2 Methodology

This study was conducted in 2022. The data used in the study is secondary data obtained from various agencies such as BAPPEPTI, Ministry of Trade, BPS-Statistics Indonesia, Ministry of Agriculture, and regional government.

The analysis was carried out through a qualitative descriptive approach with the following steps: (1) to answer objective 1, analyse the current performance and capacity of several WRS warehouses by conducting surveys and interviews with WRS warehouse managers to ask how the warehouse management institutions are, the requirements for storing and redeeming receipts, how long the process takes and the obstacles faced by farmers and warehouse's managers; and (ii) to answer objective 2, analysing the role of WRS as an instrument in strengthening national food reserves is by conducting a theoretical study to obtain justification for the role of WRS as food reserve instrument for rice and an empirical study of the success of providing WRS services with both in factoring locations and in other countries for both commodities.

3 Results and discussion

3.1 The performance of the warehouse receipt system

3.1.1 The performance of the warehouse receipt system

WRS, initially launched in West and East Java in 2008, has since expanded to encompass 76 districts and cities across 21 provinces in Indonesia [2]. According to BAPPEBTI's 2021

annual report, WRS saw significant activity in 2021. As many as 2,423 warehouse receipts were issued, representing a total commodity volume of 87,868.8 tons. The value of these commodities reached IDR 493.2 billion, with financial institutions providing funding of IDR 291.3 billion (Table 1).

Table 1. The warehouse receipt's number, volume, and value, 2013 – 2021.

Year	Warehouse receipt		Value	Financing value
	Number	Volume (ton)	(IDR million)	(IDR million)
2013	16	508.8	1,431.6	313.9
2014	13	214.1	552.9	136.8
2015	57	2,299.9	8,678.7	4,216.0
2016	271	8,895.6	40,067.7	24,049.7
2017	379	18,144.2	93,183.1	58,653.9
2018	532	20,796.2	108,948.5	66,993.2
2019	605	21,649.3	116,514.3	75,795.1
2020	300	8,931.9	81,171.7	45,597.6
2021	250	6,428.7	42,644.6	15,591.9
Total	2,423	87,868.8	493,193.6	291,348.2

Source: [2]

Table 2 provides a breakdown of commodities stored in warehouses between 2008 and 2016. The highest volume stored was dry unhusked grain, with 73,026.1 tons valued at IDR 372.8 billion. Significant quantities of rice (7,922.1 tons, IDR 60.0 billion), corn (5,699.0 tons, IDR 19.2 billion), and coffee (631.5 tons, IDR 36.6 billion) were also stored. Smaller amounts of seaweed (555.5 tons, IDR 4.3 billion), cocoa (3.1 tons, IDR 78.5 million), and rattan (31.1 tons, IDR 264.5 million) were stored during the period. Financial institutions provided a total of IDR 291.3 billion in financing as of December 30, 2016.

The data also reveals the number of warehouse receipts issued for each commodity stored: 2,124 for dry unhusked grain, 135 for rice, 108 for corn, 36 for coffee, 16 for seaweed, 3 for rattan, and 1 for cocoa. In total, 2,423 warehouse receipts were issued during the specified period. WRS in Indonesia is steadily growing. As of 2017, the system has been implemented in 83 districts and cities across 21 provinces, with the number of operators and institutions involved also on the rise [9,10]. Despite efforts to accelerate WRS adoption through the construction of 121 public warehouses (2009-2017) in 105 districts and cities across 25 provinces, the initiative has not been fully realised. Only 89 warehouses are currently functional, leaving 32 inactive. Apart from warehouses built by the government, BAPPEBTI has approved 59 private warehouses so far [11].

Table 2. Number, volume, and value of the warehouse receipt by commodity, 2008-2021.

Commodity	The number of receipts	Volume (ton)	Values (IDR million)	Financing (IDR million)
Dry unhusked grain	2,124	73,026.1	372,775.5	224,813.4
Rice	135	7,922.1	60,011.4	33,351.5
Corn	108	5,699.0	19,247.6	11,286.8
Coffee	36	631.5	36,565.0	20,805.8
Seaweed	16	555.5	4,250.9	1,090.6
Rattan	3	31.1	264.5	-
Cacao	1	3.1	78.5	-
Total	2,423	87,868.8	493,193.6	291,348.2

Source: [2]

3.1.2 The problems of the warehouse receipt system

Launched in 2006, Indonesia's WRS aimed to revolutionise agricultural financing. However, its adoption has been sluggish. Several factors contribute to this slow progress. Being a new concept, WRS remains unfamiliar and not fully grasped by stakeholders, hindering its widespread acceptance [5,6]. The system currently only applies to specific commodities, potentially excluding a significant portion of farmers. Additionally, traders appear to be the primary users, suggesting low adoption by the intended beneficiaries. The limited number of warehouses and insufficient support from local governments pose logistical hurdles, further restricting accessibility [7]. These factors combined have resulted in the underutilisation of WRS by farmers, who remain hesitant to engage with the system.

Underutilisation plagues some warehouses, with empty spaces or operations below capacity. This inefficiency can be attributed to competition from middlemen and staffing shortages, especially in managerial positions [7,8]. Previous research revealed that the implementation of the warehouse receipt system in East Java has not been utilised properly. A close relationship exists between farmer characteristics and the level of interest in adopting WRS [10]. In the last three years, WRS performance in Indonesia has decreased [8]. The main cause was climate change and drought, resulting in differences in harvest times for agricultural commodities, which caused high price volatility. The biggest challenge in implementing WRS is maintaining the integrity of WRS and increasing the trust of stakeholders (e.g. farmers, traders, banks) to utilise WRS sustainably. Until now, the ministry and the private sector have different views regarding the location of warehousing facilities. Apart from that, the regional government's commitment is still below expectations in supporting the implementation of WRS in the area after warehouse construction.

Other obstacles faced in implementing WRS relate to institutional aspects, especially the readiness of warehouse management at commodity quality assessment institutions and financial institutions/banks in the regions, limited regional government support in developing WRS policies, and high-quality standards that most farmers cannot afford and traditional marketing patterns of agricultural products [8]. The previous research by Ashari [6] stated that the public intensely perceives that WRS is not widely known to provide easy access to credit. Still, small farmers have limited access to the existence of WRS. On the other hand, the public has a weak perception that WRS has complicated regulations and is slow in processing warehouse receipts. The main problems in implementing WRS include lack of user awareness, limited facilities and access for small farmers.

A study in Cianjur and Subang using logit model regression [7] identified several factors that encourage farmers to utilise WRS: farmer age, land ownership, selling price, warehouse receipts as collateral, and transportation availability. Meanwhile, the variables of education, income, farming profits and participation in farmer groups negatively affect farmers' interest in using WRS. The research emphasises the need for a multi-pronged approach to maximise WRS adoption. This includes government initiatives focused on farmer education, improved warehousing facilities, and the introduction of insurance programs.

3.2 The warehouse receipts systems and agriculture production centre

Developing a warehouse receipt system requires preconditions in the form of "basic requirements and necessary conditions" for the widespread development of WRS services in a particular country or region [4,12]. A necessary condition is the existence of a huge production "surplus", which results in the market being unable to accommodate it, and as a result, commodity prices fall, whether this occurs seasonally or throughout the year. Table 3 presents the rice production centre areas and their production and consumption balance during 2018-2021. It can be seen that the five provinces with the largest rice surplus are

Central Java, East Java, South Sulawesi, West Java, and South Sumatra, respectively. In these areas, the government should encourage and facilitate the provision of WRS services, both purely private, BUMN, and BUMD, and private-BUMN-BUMD partnership patterns. Developing WRS services in rice production centre areas (provinces/districts) is the basis for building national food reserves.

Table 3. The average production, consumption, and surplus/deficit of rice, 2018-2021.

Province	Rice production (000 ton)	Rice consumption (000 ton)	Surplus/deficit (000 ton)
Aceh	1.115,22	462,05	653,17
South Sumatra	1.743,44	693,68	1.049,76
Lampung	1.566,65	659,7	906,95
West Java	5.899,87	3882,77	2.017,10
Central Java	6.284,05	2349,51	3.934,54
East Java	6.324,90	2967,95	3.356,95
South Kalimantan	774,16	325,18	448,98
South Sulawesi	3.329,98	789,91	2.540,07

Source: [13,14]

However, comparing the rice surplus centres and the number of warehouse receipts shows that the construction of the warehouses is not all right in the location of rice centres, and the number is still limited, most of which are government-owned warehouses (Table 4). This is one of the reasons why WRS development is slow. The construction of warehouses far from central locations will certainly increase transportation costs and other logistics costs, impacting WRS users' interest.

Judging from the performance of WRS rice in Table 4, it can be seen that the volume of surplus rice available is still much larger than the volume of rice stored in the warehouse. It is authentic proof of an untapped surplus and the potential for WRS development. The low volume of goods stored in WRS warehouses impacts the number of WRS, and the value of goods stored is still limited. The number and storage achievements of rice products through the WRS mechanism in five provinces' national rice production centres are still relatively small compared to WRS for grain commodities.

Table 4. Comparison of the rice surplus and the number of warehouse receipts, 2018-2021

Province	Rice surplus (ton)	Warehouse receipts	Volume (ton)	Value (IDR million)	Financing (IDR million)
Central Java	3.934,54	51	2.355,8	71.044,64	15.799,80
East Java	3.356,95	37	1.515,4	17.937,44	6.180,68
South Sulawesi	2.540,07	19,3	1.623,5	9.069,47	7.231,49
West Java	2.017,10	41	901,4	8.859,42	5.217,57
South Sumatra	1.049,76	1	150	1.245,00	750,00

Source: [2]

The implementation of WRS, especially for grain management, is still relatively small compared to the production potential in the five national rice centre provinces (Table 5). Overall, from the potential grain production in Central Java Province for three years (2018, 2020, and 2021), only 179 warehouse receipts were obtained with a stored grain volume of 1,557.4 tons. Likewise, in the second largest production centre in the province of East Java, at the same three points in time, an average of only 17,201.43 tons was stored, with a total of 278 warehouse receipts. West Java, the 4th national rice producer, only received 23,959.6 tons of grain that can be stored in WRS with 1,047 warehouse receipt holdings, which is higher than the WRS implementation of grain that can be reserved through WRS warehouses in South Sulawesi province and in South Sumatra.

Table 5. Implementation of a warehouse receipt system for grain commodities in the leading producer and surplus provinces based on average data for 2018, 2020, and 2021.

Province	Number of warehouse receipt	Volume (ton)	Value (IDR million)	Financing (IDR million)
Central Java	179,67	1.557,4	16.256,51	8.385,67
East Java	278,3	17,201,43	86.479,98	50.548,94
South Sulawesi	71,3	6,590,35	28.722,08	16.803,19
West Java	1047	23.959,6	136.011,53	85.132,26
South Sumatra	4	46,7	163,45	70,00

One of the main causes of the slow implementation of WRS is related to the conditions of adequate WRS implementation, including the availability of technology for storage, the existence of warehouses that meet standards, a conducive business and investment environment, the capacity of WRS warehouse managers, lack of understanding of farmers/traders regarding WRS, lack of promotion and socialisation of WRS services, many cases of fraud and bad credit related to WRS, and as a result, public trust in WRS service providers is still low. Failure to fulfil adequacy conditions is a problem faced in developing WRS services.

The basic principle of operating a warehouse receipt system for a commodity is the occurrence of price fluctuations and the existence of a production surplus in a region [4,15]. In such conditions, acceleration of warehouse placement and WRS implementation is a consideration, along with the physical provision of warehouses and management of WRS implementation.

However, in several cases, the implementation of WRS and warehouse location does not consider these primary conditions. The location of the WRS warehouse is often part of the political decision of regional leaders, in this case, the Regent, to provide land for the WRS warehouse to be built through the competence of Bappepti as the institution appointed/established for the implementation of the physical construction of the WRS warehouse. The impact of this policy has become an obstacle to the success of implementing WRS at the district level. Many WRS warehouses are built in inappropriate locations with limited accessibility and support for supporting WRS warehouse activation. Apart from that, economically and according to the calculations of farmers or other users, using the WRS will increase transportation costs and pose risks to road facilities and security related to storing goods in the WRS.

The relationship between the WRS pattern as a national government food reserve and regional (district/city) and sub-district food reserves is not fully connected to the system, data collection and the continuity of WRS implementation. Data related to food stored in the WRS is not directly reported to the Food Security Service or the agency assigned to food reserves. Reporting from each WRS is carried out directly to Bappepti. Thus, information and data on grain or rice stocks stored in each WRS warehouse are not yet connected with overall regional and national food reserve data. In its development, the handling of food reserves is currently also linked to controlling regional inflation through the Controlling Inflation Team. The role of the WRS should also be part of these activities. However, it has not been well coordinated in several locations, including the role of WRS through the activities of the Department of Industry and Trade at the district level.

On the other hand, the implementation of WRS for grain and rice is also not running optimally, where the goods stored also do not meet the capacity of the warehouse that has been prepared for its purpose. In fact, in the development of its implementation, many of the WRS warehouses are empty, and there is no grain or rice storage activity. Continuity and vacancies in grain and rice storage are due to the fact that at the time of harvest, the farmers' grain has been sold to the grain sales market and absorbed at an attractive price. In this way,

farmers immediately sell the grain (wet or dry) directly to buyers and it is absorbed. There are indications that the WRS mechanism is also less attractive because many requirements must be met, compared to the benefits obtained for the farmers themselves [16,17].

The warehouse receipt system as an instrument to support regional and community food reserves can be done by synergising the role of WRS implementation with institutions related to other food reserves such as community food barns, LUPM/LDPM, BUMDes businesses and BULOG, where WRS becomes a "transit institution" between management, the community as a food provider and BULOG.

Grain products collected from community activities are then stored through the WRS mechanism to provide benefits from financing and increasing prices. However, it will be constrained by the status of the grain, which will be stored for commercial purposes or only as a food reserve. Is the mechanism for implementing WRS through community grain storage goal-directed at the economic aspect, considering that ownership of food at the community level is more static and related to indigenous communities within a specific time relatively long, compared to the storage requirements at WRS of only 1-3 months? However, when the WRS food reserve approach is based on recorded/reported storage stock from each WRS warehouse within a specific period, it is still possible that the WRS can also become an institutional instrument for food reserve data, both at regional and national scales [18,19].

It seems that the potential of WRS as a national food reserve instrument still needs to be accelerated in disseminating its implementation. It is essential to pay close attention to the legal basis and implementation of regulations (UU, PP and Presidential Decree), including the presence of the WRS umbrella organisation. The absence of a WRS Agency/Council, which can provide coordination and synergy between ministries/institutions, is estimated to be the main obstacle to utilising WRS to build and improve the national food reserve system [20–22].

4 Conclusions and policy recommendations

4.1 Conclusions

Until now, the performance of WRS, related to the volume and value of commodities, is minimal compared to the volume and value of food and agricultural commodity production in Indonesia. The performance of WRS implementation for grain and rice is minimal compared to the Government Rice Reserve (CBP) requirement of 1.5-2.0 million tons per year. Thus, to date, WRS has not functioned as an instrument for building CBP and national rice reserves.

Some of the problems with WRS are (a) the lack of facilities and infrastructure for warehousing and guarantee institutions, which can cause distrust on the part of guarantors for damage to commodities before their due date; (b) the quality of goods is not uniform, especially the shelf life of agricultural commodities varies; (c) commodity price fluctuations that are very quickly affected by developing issues; (d) the costs are too high (warehouse rental costs, collateral managers, appraisal institutions, insurance, registration, etc.) so that only non-UMKM companies can afford to utilise WRS; (e) interest rates are still too high, unattractive for farmers and entrepreneurs who need time for the next harvest; (f) limited potential market for commodities traded using warehouse receipts, and (g) relationships between institutions that lack synergy.

4.2 Policy recommendations

This study provides several policy recommendations as follows: (1) it is necessary to fulfil the conditions for the adequacy of WRS, such as availability of technology for storage,

existence of warehouses that meet standards, conducive business and investment environment, capacity of WRS warehouse managers, farmers/traders' understanding of WRS, promotion and socialisation of WRS services; (2) there is a need to pay attention to the existence of the legal basis and implementation regulations, including the existence of the WRS umbrella organisation; (3) it is necessary to synergise the role of implementing WRS with institutions related to other food reserves such as community food barns, LUPM/LDPM, BUMDes businesses and BULOG, where WRS becomes a "transit institution" between food management activities carried out by the community so far and BULOG; and (4) it is necessary to revise Law No. 9/2011, by adding an article about the WRS Council, and appointing the Head of Bapanas as chairman of the WRS Council.

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