

Dynamic System Model of Receipt System (SRG) Grain Commodities in South Sulawesi

Mardia Mardia¹, Didi Rukmana², Mahyuddin³, Mardiana Ethrawaty Fachrie⁴, Diah Retno Dwi Hastuti⁵

¹Economics Department, Faculty of Economics, Universitas Indonesia Timur
Makassar, Indonesia

²Socioeconomic Department, Faculty of Agriculture, Universitas Hasanuddin
Makassar, Indonesia

³Socioeconomic Department, Faculty of Agriculture, Universitas Hasanuddin
Makassar, Indonesia

⁴Faculty of Fisheries and Marine, Universitas Hasanuddin
Makassar, Indonesia

⁵Economics Department, Faculty of Economics, Universitas Negeri Makassar
Makassar, Indonesia



Abstract— This research aims to determine the warehouse receipt system policy strategy partially and globally that occurs between the ideal and actual types in the field of seaweed receipt system (SRG) in South Sulawesi. Using dynamic systems. The study aims to illustrate the ideal type of SRG, illustrate facts and realities in the field, analyze the SRG gap in South Sulawesi (ideal type and facts in the field), and SRG gap scenario both globally and partially. Held in August 2019- August 2021. The research was conducted in 3 regencies in South Sulawesi, including Gowa Regency, and East Luwu Regency. The results showed that the income obtained from the actual (existing) model using SRG is higher than direct income (selling grain directly) without entering the warehouse (SRG), as well as real income (where 100% of grain entering the warehouse is directly sold at a time without delaying sale). The results showed that there is a difference in revenue earned (lost profit / benefit loss) if it does not optimize the existence of warehouses, in other words that the average revenue loss per year is 177.64 billion. The model shows that by delaying sales, there is a difference in profit (difference in revenue) of 36 billion to 320 billion or an average of 177.64 billion per year. The scenario model was developed with the ideal model optimization considerations, namely optimizing the difference in income obtained from the 30% delay in selling with strategies to increase agricultural productivity through increasing farmer productivity, obtaining reliable price information, adequate storage space, efficient quality testing procedures, multi-layer intermediaries, absence of hidden costs, and transportation costs of conducting training and socialization of training / training or field schools about Warehouse Receipt Systems. It appears that grain production is increasing very well. It appears that production in 2021 increased by 2,275.13 tons or up about 0.56% from the previous year. This condition indicates that the well-developed scenario model provides significant improvement

Keywords— Keywords: Warehouse Receipt System, Grain Commodity, Dynamic System

I. INTRODUCTION

Classic problems that occur in grain harvests, especially in the harvest season, often arise problems in the marketing area. Therefore, special efforts are needed through policies to ensure sustainable growth of food production. In addition, fluctuations in the price of rice which is a staple greatly affect the price of other commodities that can cause considerable inflation or deflation. It is said that the yield is more absorbed by middlemen, and the standard price of rice purchased by the government is lower than middlemen, and the price game of middleman rice harms farmers.

One of the crucial issues is the commodity price factor, where during the harvest season, commodity supply increases, commodity prices drop drastically, creating a low bargaining position for farmers. This condition continues to occur from time to time and can reduce the interest of farmers. For this reason, the Indonesian government issued Law Number 9 of 2011 concerning the Warehouse Receipt System, which among other things encourages the smooth running of agricultural production to realize equitable distribution of community welfare through the warehouse receipt system as one of the financing instruments. This instrument delays selling if the commodity price is low and sells it when the price rises according to expectations [1]

The major advantages of this device are the availability of notable products at the favored time in sufficient quantities, secure prices, lower storage costs, and imparting loans and credit that qualifies to farmers [2]

For farmers, access to cash financing sources is important for continuous connectivity in production activities, so that the inhibition of financing acquisition, will ultimately hamper the management of production, productivity, and marketing of agricultural products. To obtain funds quickly, farmers can sell their products in a short time, but because they are sold before harvest, they are unable to obtain a reasonable price. On the other hand, if farmers sell their products in the harvest season, there will be a situation of oversupply in the market, and the prices received by farmers will be lower. In other words, the difficulty of farmers getting a decent price, thus hampering the continuity of funding sources for their production activities. The alternative solution above is the warehouse receipt system (SRG) [3]

In general, farmers face two main problems—uneventful cash flow and the unavailability of intermediary funds. Warehouse receipt financing can play an important role in streamlining farmers' income by providing liquidity at a time when cash flow is drying up. According to Apriyantono (2004), some agricultural problems in Indonesia are capital and price. Farmers (capital side) are faced with a lack of business capital and prices, a lack of a banking system for farmers, unavailability of agricultural guarantees, and an ijon system. On the other hand, farmers (priced side) obtain costs that are not appropriate, fluctuating, based on traders, and losses. Farmers are faced with a decrease in costs at the time of harvest while agricultural needs must be met. The rice production improvement program still faces several obstacles, including low rice prices at the farmer level, very low grain/rice exchange rates, the implementation of ineffective rice import tariffs to protect domestic rice prices, food procurement credits using commercial interest rates and Food Security. Credit (KKP) that has not been channeled smoothly, limited ability of farmers in storing grain to get the desired selling price, and dependence on rice as a source of carbohydrates is still quite high, which is 120-130 kg / capita / year. Farmers are often faced with falling commodity prices at the time of the harvest. However, they need money for agricultural venture capital or debt before meeting their needs. Prediction of agricultural commodity prices becomes one of the important marketing factors for farmers, especially in the process of warehousing (storage). This is because price plays an important role in optimizing market formation and marketing strategies. On the other hand, the formation of prices is important for the government in taking policy [4].

Warehouse receipt financing is a very precise method, which on the one hand will provide an opportunity to store goods and at the same time, use published recipes against stored goods as collateral to increase financing further. Although the system is very precise, its utility depends on the way it is conducted by participants, regulators, Warehouses. Efficient warehouse receipt financing allows farmers to avoid direct sales after harvest when prices are depressed. It encourages storage by reducing costs and by increasing liquidity across the commodity chain, which in turn also reduces price volatility. By giving farmers access to these financing tools, it increases their ability and incentive to invest in production. Parties involved or interested in warehouse receipt systems Farmers who are looking for high prices, traders looking for storage and credit, traders who want to participate in arbitrage, factories and processors looking for raw materials are most likely most interested in this system. Storage facilitates putting materials in and removing them from warehouses at the most profitable time, depending on stakeholder interests [5]

According to Miranda (2019) that warehouse receipt financing theoretically allows farmers, traders, processors, and exporters in developing countries to use stashed goods as loan collateral while waiting for future sales at higher prices. As a result, warehouse

receipt systems (WR) prevent smallholder farmers from selling surplus products during the usually lowest harvest. However, in practice, smallholder farmers in developing countries generally do not obtain warehouse receipt financing. By contrast, in much of sub-Saharan Africa, wholesalers, processors, and exporters almost exclusively use warehouse receipts. Warehouse Receiving System (WRS) can be defined as "a platform that allows farmers, traders, processors and exporters to obtain guarantee funds for agricultural products stored in warehouses [6]

For warehouse receipt financing to benefit a small farmer, the price he receives for grain stored in the warehouse must get a premium over grain stored on the farm to offset higher storage costs and grain processing surcharges to meet the law. high standards required for the issuance of warehouse receipts. The cost of storing grain in a commercial warehouse and getting a home receipt loan is significant and can easily exceed the cost of storage on a farm. Warehouse storage and warehouse receipt financing costs include: the cost of loading and transporting grain to the warehouse; costs for the demolition, sampling, assessment, cleaning, drying, and packaging of grains at the time of delivery; pest control, fumigation, utility, and use of warehouse space while grain is in the warehouse; and costs for collateral management, including costs for safety, insurance, and quality and humidity monitoring. Storing grain in a warehouse will avoid post-harvest losses suffered by grain stored on farms in unfavorable conditions and will improve its overall quality through processing that must be done to meet the higher standards required for the issuance of warehouse receipts. However, if the improved quality fails to generate a premium price in the market, the cost will not be recoverable, and small farmers will be better off selling the grain at harvest or storing it in the fields and selling it later. If warehouse receipt financing is to be adopted by small company holders, either the cost of warehouse receipt financing should be reduced for smallholder farmers or the premium price obtained from grain stored in the warehouse must be raised [7]

Due to insufficient supply and strong demand, food prices experience cyclical fluctuations and sharp declines during the harvest period. The peculiarities of agricultural production result in farms being forced to sell their products under unfavorable conditions to resume production. The universal warehouse system allows farmers who were previously unable to use bank loans to finance continued production to obtain the necessary funds effectively with the support of warehouse receipts as collateral. This can have a positive impact on national food security by stabilizing prices, reducing cyclical changes in staple food production, and ultimately [8] .

II. RESEARCH METHODS

Research was carried out for 1 year because of the Covid 19 pandemic so that research was hampered, especially in data retrieval in the field. Held in August 2019- August 2021. Broadly speaking, this research is carried out with three stages, namely the data collection stage, the data processing stage, and the data analysis stage. The data collection phase began with a series of discussions with warehouse receipt system experts and warehouse managers in South Sulawesi. The research was conducted in 2 regencies in South Sulawesi, among others, Gowa Regency and East Luwu Regency. The determination of these 2 districts is because it produces the production of grain, seaweed and corn that uses the Warehouse Receipt System as a medium to store its commodities.

The data collection techniques used in this study are observation, interview, focus group discussion (FGD), documentation and multimedia. The analytical tool used in this research is the dynamic systems approach. The interrelationship of the relationship between each subsystem and the impact of that subsystem on SRG South Sulawesi is used as a strategic option, and its relationship in the system needs to be tested, therefore if this tool is used in this study.

Dynamic systems are approaches to thinking about and simulating situations and organizations of all types and sizes by visualizing how those elements fit, interact, and change over time. key concepts and tools: feedback structure and behavior, causal circle diagrams, dynamics, are practically illustrated in a wide variety of contexts ranging from hot baths to symphony orchestras and the practical application of these approaches are explained through several tangible examples of their use for strategic planning and evaluation. This approach helps you develop a strategic overview of an organization and visualize how parts of a business, industry, or society fit in and interact to create dynamics and change over time.

Figure 2. Actual Model stock flowchart

3. Simulation results

3.1. Actual model type (existing model)

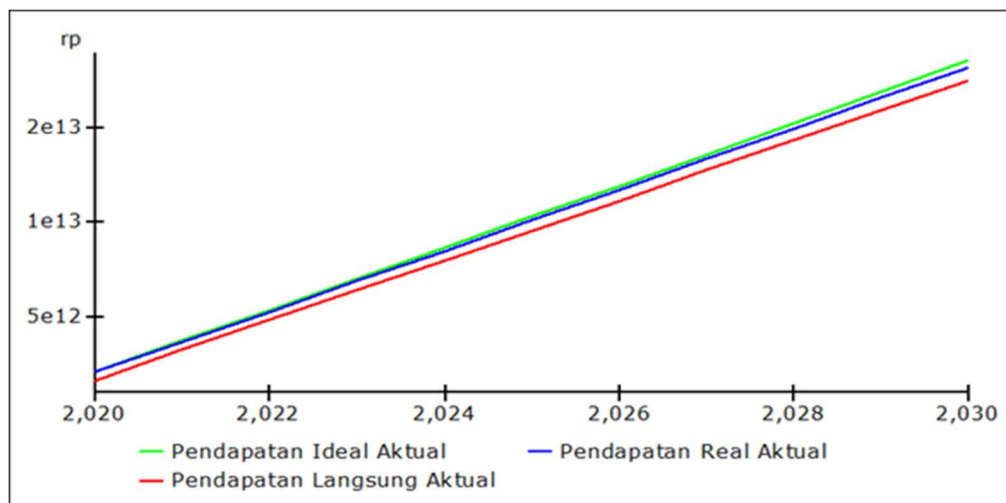


Figure 3. Income

The results showed that the income obtained from the actual (existing) model using SRG was higher than direct income (selling grain directly) without entering the warehouse (SRG), as well as real income (where 100% of the grain entering the warehouse was directly sold at the time without any delay in sale).

Table 1. Direct Income Comparison, Actual Real, Actual Ideal and Actual Model

Year	Actual Direct Income	Actual Real Income	Actual Ideal Income	GAP Actual Model Revenue
2020	1.61e12	2.02e12	2.05e12	36.318.600.000,00
2021	3.20e12	3.63e12	3.69e12	64.598.683.200,00
2022	4.78e12	5.24e12	5.33e12	92.907.038.453,99
2023	6.36e12	6.85e12	6.97e12	121.243.665.761,98
2024	7.95e12	8.47e12	8.62e12	149.608.565.123,97
2025	9.54e12	1.01e13	1.03e13	178.001.736.539,94
2026	1.11e13	1.17e13	1.19e13	206.423.180.009,91
2027	1.27e13	1.33e13	1.36e13	234.872.895.533,88
2028	1.43e13	1.49e13	1.52e13	263.350.883.111,84
2029	1.59e13	1.66e13	1.69e13	291.857.142.743,79
2030	1.75e13	1.82e13	1.85e13	320.391.674.429,74

1.2. Ideal Type of Grain Commodity Warehouse Receipt System

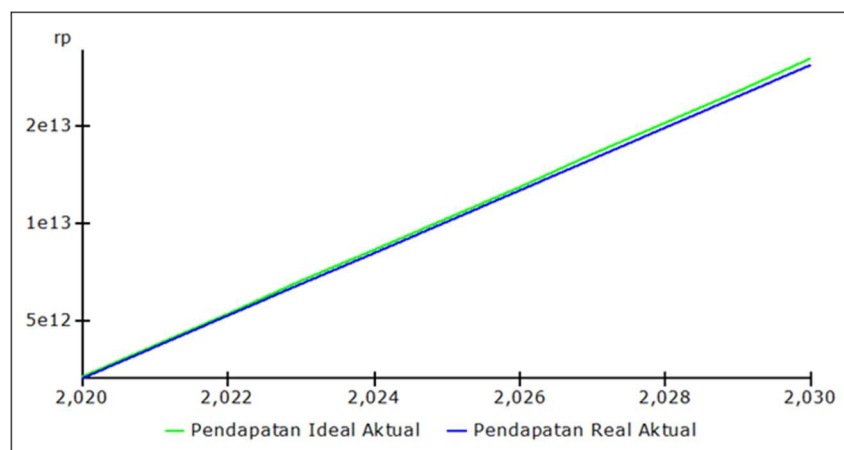


Figure 4. Comparison of real income with ideal income (which should be received)

The results showed that there is a difference in revenue earned (lost profit / benefit loss) if it does not optimize the existence of warehouses, in other words that the average revenue loss per year is 177.64 billion. The model shows that by delaying sales, there is a difference in profit (difference in revenue) of 36 billion to 320 billion or an average of 177.64 billion per year.

1.3. Analysis of the SRG gap in South Sulawesi (ideal type and facts in the field)?

The results of gap analysis are obtained that there is a difference or between the ideal type, namely by delaying the sale by 30% in accordance with the applicable provisions so that the ideal profit will be obtained.

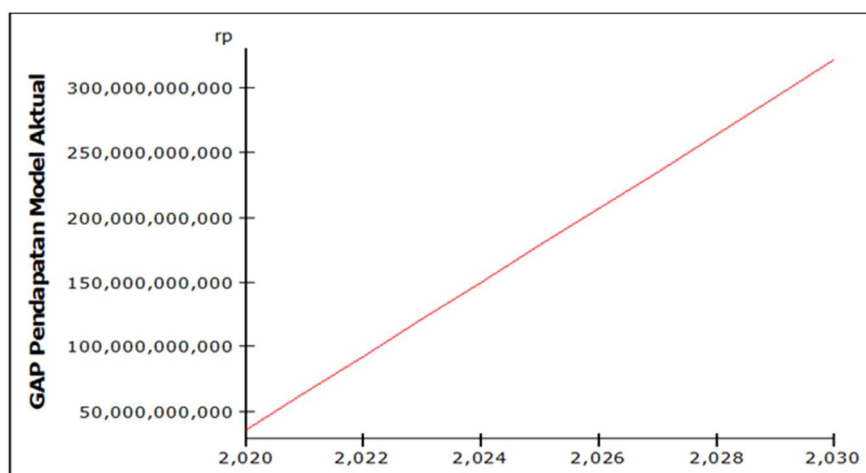


Figure 5. Actual Model Revenue Gap

1.4. What is the SRG gap scenario both globally and partially?

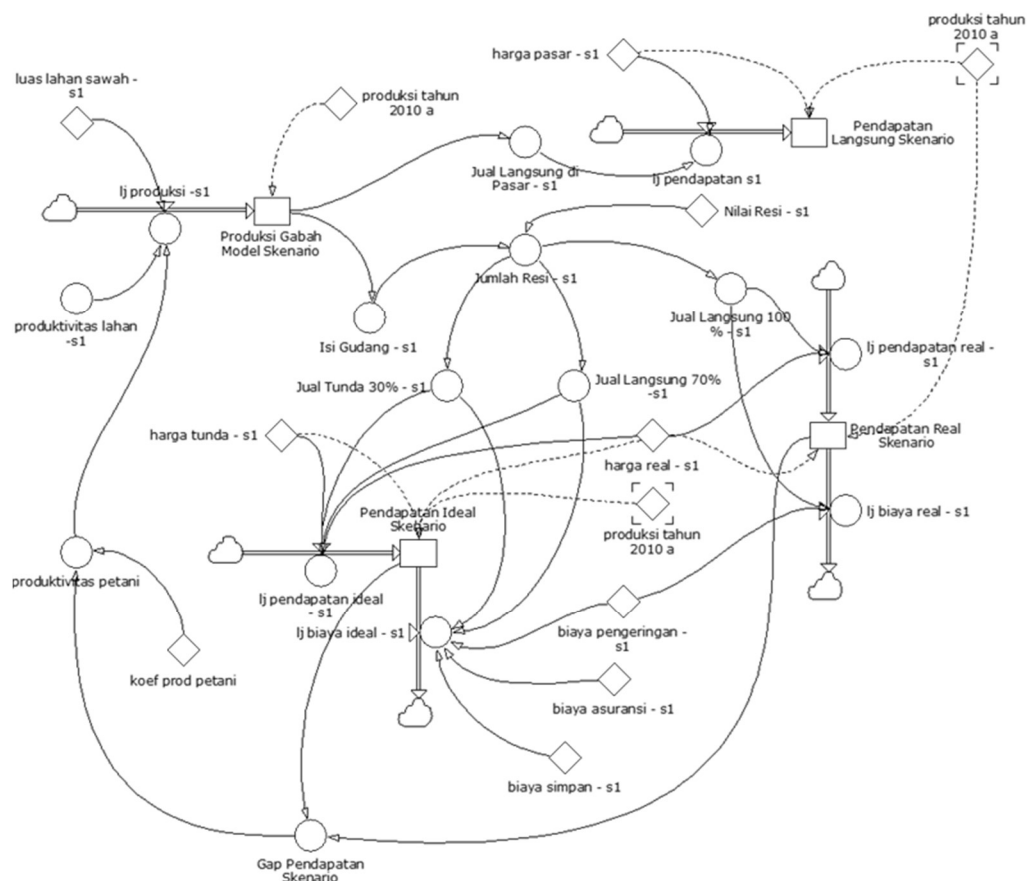


Figure 6. Model Scenario

The scenario model was developed with the ideal model optimization considerations, namely optimizing the difference in income obtained from 30% delay in sales with strategies to increase agricultural productivity through increasing farmer productivity, obtaining reliable price information, adequate storage space, efficient quality testing procedures, multi-layer intermediaries, absence of hidden costs, documentation challenges, and transportation costs and conducting training and socialization of training / training or field schools about warehouse receipt systems.

Based on this scenario, the results of the simulation model:

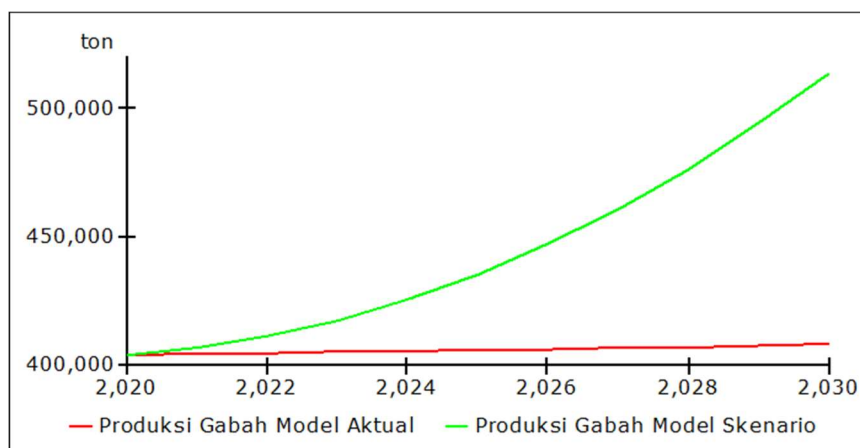


Figure 7 Result of The Simulation Model

It appears that grain production is increasing very well. It appears that production in 2021 increased by 2,275.13 tons or up about 0.56% from the previous year. This condition indicates that the well-developed scenario model provides significant improvement.

Table 2. Gap In Actual Grain Production and Scenario Model Grain Production

year	Produksi Gabah Model Aktual	Produksi Gabah Model Skenario
2,020	403,540.00	403,540.00
2,021	403,943.43	406,218.56
2,022	404,346.85	410,668.68
2,023	404,750.28	416,902.14
2,024	405,153.70	424,938.46
2,025	405,557.13	434,805.00
2,026	405,960.55	446,537.06
2,027	406,363.98	460,177.94
2,028	406,767.40	475,779.16
2,029	407,170.83	493,400.58
2,030	407,574.25	513,110.71

The increase in production by itself provides a gap (gap) of income earned by farmers, both direct income, real income and ideal income. Like the following figure 8 - 10.

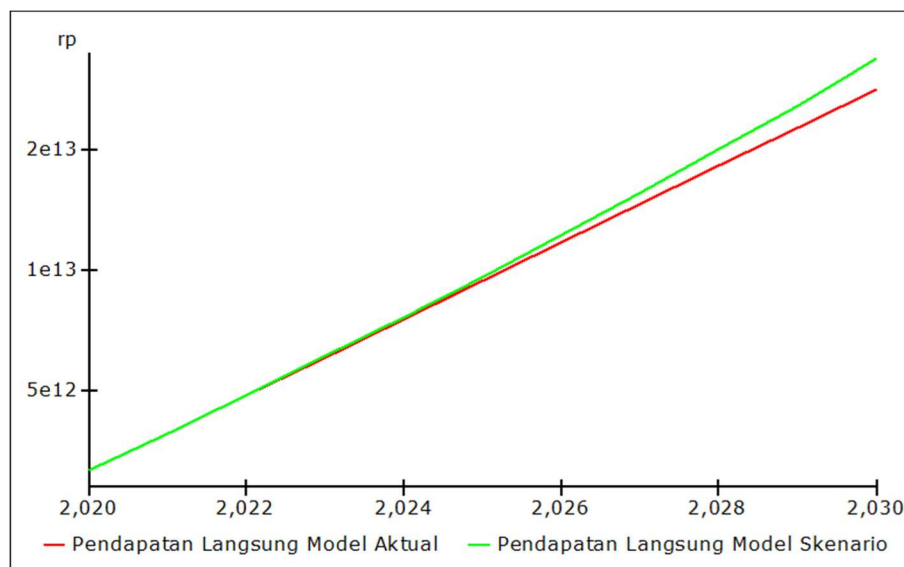


Figure 8. Direct Revenue Comparison Between the Actual Model and The Scenario Model

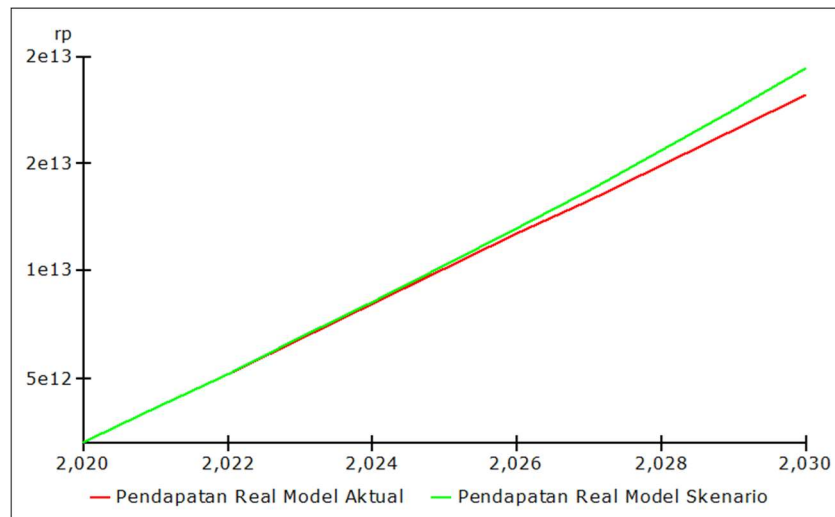


Figure 9. Comparison Of Real Income Between the Actual Model and The Scenario Model.

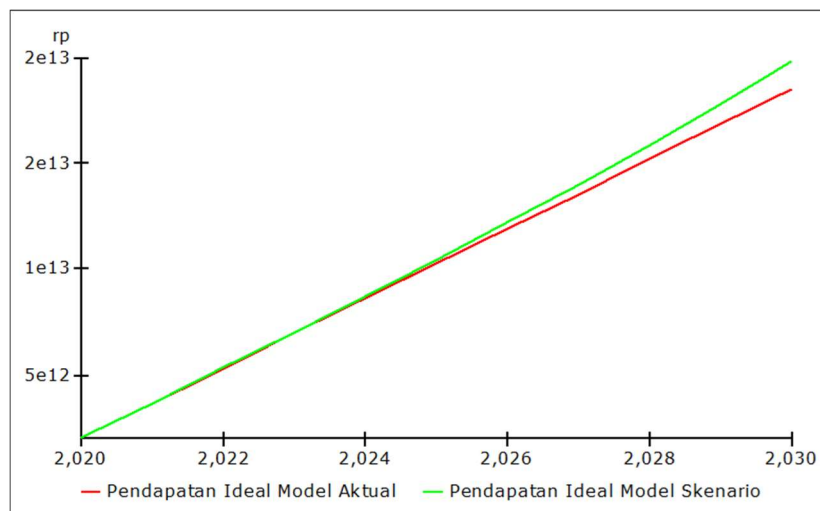


Figure 10. Ideal revenue comparison between the actual model and the scenario model

B. Discussion

The results of research that reveals that there are several things we must do so that the Warehouse Receipt System (SRG) can increase the income and welfare of farmers, among others: (1) Financing cost can 'make or break' the continuity of SRG. With one of SRG's goals being to help facilitate trade financing, financing costs that exceed reasonable prices increase lowering the attractiveness for depositors to take warehouse receipts. (2) Price stability in seasons is essential for farmers' companies/organizations to make informed storage decisions, and for financial institutions to advance finance. In price stability the year allows depositors and financial institutions to accurately estimate intra-seasonal price changes. This helps depositors to know the optimal duration for storing commodities by considering the costs they will incur and helps reduce the risk of financial institutions. (3) Communication with stakeholders about the advantages and disadvantages of SRG is very important. SRG providers need to ensure that stakeholders are well informed about the services they provide and access to finance their WR. Explaining the advantages and disadvantages of using SRG for storage as well as financing can help SRG providers reach wider stakeholders, not only farmers and merchant organizations but also small to large farmers [9]

Small farmers need working capital for primary production, and long-term finance to invest in post-harvest infrastructure that can reduce losses and improve product quality. Therefore, improving financial access can help smallholder farmers living in extreme

poverty to increase their wealth and food production. Unfortunately, despite the government's efforts to promote agricultural financing, financial institutions (LK) continue to see the agricultural sector as a risky sector. The challenges inherent in agricultural value chains also hamper financial flows: lack of collateral, low productivity, unpredictable climate, inadequate storage and processing, as well as market uncertainty, making it difficult for farmers to access finance [10]

IV. CONCLUSION

Warehouse receipts are essentially speculative activities that require careful monitoring of grain quality and market price trends and fluctuations. If designed and managed properly, warehouse receipt financing plans can transform smallholder farmers from "price earners" in the local market economy into "price-takers". The mechanism can also provide a conduit for rural entrepreneurs to raise capital, which can be invested in more diversified and sustainable companies, thereby driving long-term rural economic growth and development, thus contributing significantly to overall rural economic growth. In line with economic growth. Nation [10].

Policies important to the implementation of SRG include the need for governments to spearhead standard promotion; increased productivity of smallholder farmers; strengthening collective action capacity; and the importance of increasing sensitization in all aspects of SRG. The challenge implies that not all key SRG players understand SRG, have many expectations towards SRG, which are unfulfilled and may not be sensitive enough to the operation of SRG. Therefore, mass sensitization of all aspects of SRG to all actors is recommended as a starting point for answering such challenges. Market performance will also be guaranteed if certain barriers to credit can be overcome. We recognize that access to credit under SRG is largely related to production levels the more the better. It demands increased productivity of smallholder farmers through intensification and commercialization of all this requiring the use of agricultural inputs [11].

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