

Comparative Study of Net Income of Rice Farmers Participant and Not Participant the Warehouse Receipt System in District Barito Kuala Kalimantan Selatan

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Abstract: *The purpose of this research is to analyze revenue and comparative net income of rice farmer SRG and Non warehouse receipt system; knowing the management of the commodity grain and problems faced with the implementation of the warehouse receipt system. Respondents to this study totaled 80 respondents with details of 11 SRG farmers taken using census methods and Non-SRG farmers were taken as many as 69 farmers based on the highest crop area by using random sampling methods. Because the majority farmers work on local rice types in the village of Gampa Asahi River Rantau Badauh Sub District and DesaTabingRimbahMandastana District Barito Kuala. The data processing method used to analyze the net income of rice farmers is to calculate the total cost of farming both explicit and implicit costs by using the formula $I = TR - TC$ and the comparison of revenues using the tools T test analysis is not paired. Based on the results of the research and data processing, it is obtained (a). The farmer's net income is average of IDR 40.053.040,-/farming (IDR 11.907.660,-/ha). While the net income of farmers non-SRG averages IDR 8.795.649,-/farming (IDR 7.016.218,-/ha). (b). The results of the T-Test analysis show that the farmer's income for SRG has a real effect on non-SRG farmer's income. (c). Management of dried rice paddy (GKG) is aimed at assisting farmers in delaying the sale and management of agricultural products and facilitating the provision of financing for farmers in conducting farming activities*

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I. Introduction

Agricultural sector is a buffer of national food needs, but also as an activator for the economic activity for farmers. If this sector is managed properly, the agricultural sector can fulfill food needs and more importantly can increase the income of farmers in Indonesia. Efforts to develop the agricultural sector in Indonesia are still experiencing some obstacles, such as in terms of financing for carrying out farming activities because at the time of harvest the commodity price is low so that farmers experience a decrease in income which makes the need for farming or family business activities will also be reduced and will have an impact on agricultural productivity. Along with the price of agricultural commodities that are volatile.

The warehouse receipt system is an alternative in financing access to farming activities. In an effort to increase the income of farmers and their families, the warehouse receipt system is one of the efforts that can be done through the grain storage by delaying sales. Because at the time of the harvest the grain price decreases, the reverse when after the grain harvest price will increase.

Determination of the price level of agricultural commodities is very necessary for goods and services produced as well as goods and services produced or obtained inputs. According to Kasim (2004) the price is the value expressed in units of currency or other means of exchange at the farm level, that is, the price that actually applies at the farm location concerned.

The first Warehouse Receipt System that was built and implemented in South Kalimantan Province was found in Barito Kuala Regency, precisely started in 2010 with the commodity stored in the SRG warehouse is grain. Barito Kuala Regency is an agricultural area and rice barn in South Kalimantan. According to the Batola Industry and Trade Cooperatives Office (2018) the contribution of the Barito Kuala Regency to the national food security program in South Kalimantan is first. Barito Kuala is a rice contributor of 17.28% of South Kalimantan's total production of 1,827,197 tons.

II. Material And Methods

Research was conducted in the regency of Barito Kuala Province South Kalimantan from February 2019 until July 2019.

Study Sampling Design: Simple Random Sampling

Sample Size: 80 Respondents

Study Duration: February 2019 to July 2019

Subject and Selection method: Determination of 11 samples of warehouse receipt system rice farmers and non warehouse system receipt farmers were taken in two sub-districts namely Mandastana District (TabingRimbah Village) and Rantau Badauh (Gampa Asahi Village) Barito Kuala Regency, amounting to 69 farmers based on the highest harvested area. In addition, it was also obtained from the warehouse manager in implementing SRG. Data was collected by interview assisted by a questionnaire.

Type and Data Source: Data used in both primary and secondary data.

Data Analysis: To answer the first goal, which is to analyze the net income of rice farmers who use and do not use the Warehouse Receipt System in Barito Kuala Regency is as follows:

$$TC = TC_E + TC_I$$

TC = Total Cost (Rp)

TC_E = Explicit Cost (RP)

TC_I = Implicit Cost (RP)

Determining the acceptance of farming using the formula:

$$TR = P \cdot Q$$

TR= Total Revenue (Rp)

P =Price (kg)

Q=Quantity (kg)

Determining farming Income using the formula:

$$I = TR - TC$$

I=Income (Rp)

TR=TotalRevenue(Rp)

TC=Total Cost (Rp)

To answer the second goal, which is to look at the differences in net income of rice farmers who use and do not use the Warehouse Receipt System in Barito Kuala Regency. By using an unpaired T Test analysis tool because the variance of the two samples is not homogeneous, then it is calculated using the formula:

$$t_{hit} = \frac{\bar{x}_I - \bar{y}_I}{\sqrt{\frac{S^2_X}{n_1} + \frac{S^2_Y}{n_2}}}$$

Keterangan:

\bar{x}_I =The average income of farmer SRG.

\bar{y}_I =Non-SRG farmer's income average.

S²x=Variance using warehouse receipt system.

S²y = Variances that do not use the warehouse receipt system.

n1= The number of respondents from farmers uses warehouse receipt system.

n2= Number of respondents from farmers who do not use the warehouse receipt system.

To know the third and fourth goals, namely the warehouse receipt management system starting from storing grain until the grain is removed from the SRG warehouse and the problems faced in the Warehouse Receipt System in Barito Kuala Regency, namely by using descriptive analysis

III. Result

Characteristics of respondents

Respondents consisted of three age groups namely the age of unproductive (<15 years), productive age (15-64 years) and the age of non-productive (> 64 years). Age affects the physical ability of respondents in managing their business. Thus, in this study that respondents SRG and Non SRG rice farmers included in the

productive age. This is in accordance with the Central Statistics Agency (BPS) that the productive age is from the age of 15 - 64 years.

Level of education. The results showed that 2 SRG farmers were elementary school graduates/equivalent, 3 junior high school graduates/equivalent, 5 senior high school graduates/equivalent, and 1 graduate in Bachelor/Higher Education. While 38 Non-SRG farmers were respondent farmers with an elementary school/ degree, 15 junior high school/equivalent graduates, and 3 high school/equivalent graduates. The higher a person's education, the better the person's mindset.

Period of Farming Business. The results showed that the duration of rice farming in SRG farmers ranged from <20 years are 6 people, 21-30 years are 4 people, and 31-40 years is 1 person. While Non SRG farmers, namely <20 years, amount to 39 people, ranging from 21 - 30 years are 13 people, 31 - 40 years are 14 people, and > 41 years are 3 people.

Number of family dependents. The results showed that the SRG farmers with no dependents of 2 people, the number of dependents 1-2 people as much as 2 people, the number of dependents 3-4 people as many as 6 people, and the number of dependents 5-6 people as much as 1 person. While Non SRG farmers with no dependents as many as 9 people, the number of dependents 1-2 people as many as 32 people, the number of dependents 3-4 people as many as 27 people, and the number of dependents 5-6 people as much as 1 person. The highest number of dependents of family respondents in this study had dependents of 1-2 people.

Land area. The results showed the total land area cultivated by SRG farmers was 37 ha with an average land area of 3.36 ha. While the total land area cultivated by Non SRG farmers is 86.5 ha with an average land area of 1.25 ha.

Warehouse Receipt System

Warehouse Receipt System is one way that farmers can get funding / financing for farming activities carried out by using receipts issued by the warehouse manager for commodities stored in the warehouse. In the implementation of SRG in Barito Kuala district, not all farmers use their receipts to be used as collateral / guarantees, but farmers use SRG to delay sales by looking at the prevailing market prices. If the selling price of grain increases or returns to normal, the farmer will remove the grain from the storage warehouse to offer or sell directly to the market.

In the implementation of the Warehouse Receipt System in Barito Kuala Regency in 2018 farmers who used warehouse receipts to be used as collateral to finance the South Kalimantan Bank were 13 farmers in the Handil Bakti branch unit with a total loan of IDR 717,000,000, - with an interest subsidy of IDR 8,368,288, - or 5.5%.

Table No 1: Components of grain storage costs at the Batola SRG.

Component cost	Cost (IDR)
Quality test fee	12
Loading/unloading cost	30
Fumigation/maintenance Fee	8
Insurance fee	12
Registration Center Fee	8
Amount	70
Additional fees	
Warehouse Management fee	98
Warehouse Retribution Fee	25
Amount	123
Total Cost	193

Source: Primary Data, 2019

The minimum amount of grain stored in the SRG implementation depends on the warehouse manager in each region. In implementing the Warehouse Receipt System in Barito Kuala Regency the warehouse manager sets a minimum amount of storage of 4 tons of dry milled grain (GKG).

Standard of Quality. The main quality standard that must be met is in the aspect of grain moisture content to be stored. Warehouse management conducts checks on the grain that will be stored in the warehouse through the institution's appropriations, which are tasked with assessing the grain quality standards that must be met by farmers, but in the aspect of grain moisture content to be stored. However, during the SRG implementation, especially in 2018 there were no farmers who stored their unhusked rice that did not meet the specified water content. This is because farmers already know the quality standards of grain to be stored so that farmers have to dry before storing in a warehouse. This is in line with the grain quality standard according to SNI 01-0224-1987, namely grain water content is the main component with a maximum content of 14%.

Table No 2: Quality standard of grain commodity.

No	Quality components (%Maximum)	Quality
1	Up air	14.00
2	Hollow Grain	2.00
3	Broken grain + Yellow grain	5.00
4	Items whitewashing + young grain	5.00
5	Red Grain	2.00
6	Foreign objects	0.50
7	Gabah Other varieties	5.00

Source :*Department of Industrial and Trade cooperatives, 2018*

SRG Commodity validity period. During 1 storage period, which is for 6 months of storage period. If during the 6 months the unhulled rice has not been removed from the warehouse, farmers will not be charged additional fees. However, grain will be moved to the drying warehouse for a maximum of 1 to 2 months and after that the grain must be removed from the existing warehouse or returned to the owner of the goods.

Warehouse receipts that have been issued by the warehouse manager can be used by farmers as collateral in lending funds to support their farming activities to financial institutions, in this case in Barito Kuala Regency, the Handil Bakti unit of Bank Kalsel, which is in accordance with the provisions that can be given to farmers / debtors of 70% of the receipt value or a maximum of IDR 75,000,000 / debtor or IDR 500,000,000 / group. The maximum borrowing time for grain commodities is 6 months with a credit maturity date of less than 15 days from the maturity date of the Warehouse Receipt.

Farmers who are members of the SRG release goods by submitting a report to the warehouse manager and submitting the receipt they have. The release of goods also depends on the farmer, there are those who release the grain from the warehouse directly from all the grain they own, but there are also those who release the grain gradually by looking at the prevailing market prices.

In the implementation of the SRG the warehouse manager does not provide information and market prices but the owner of the goods who follow market developments. In 2018 in the implementation of the SRG in Barito Kuala District, 20 warehouse receipts were issued.

Highest and lowest grain price in 2018

The harvest period in Barito Kuala Regency ranges from September to November with fluctuations in the price of dry milled grain (GKG), which ranges from an average price of IDR 6,000 / kg to IDR 7,000 / kg. During famine, it usually occurs in February - May with higher grain prices of IDR 7,000 - 8,000 / kg.

Cost of farming

The cost is the value of all economic sacrifices needed to produce a production of all expenses expressed in money to produce a product. The intended cost components are the cost of buildings, tools and tools, land, capital interest, labor costs, production facilities are seeds, food, medicines and others (Kusnadi, 2006).

Fertilizer Cost. Fertilizers used in rice farming in this study include Urea, Phonska, Organic, Lime and SP36 fertilizers. Fertilizers used in SRG rice farming are calculated from one planting season, which is for 9 months from before planting to the planting and maintenance of the respondent's rice farming. In the pre-planting activities, SRG and non-SRG farmers used Limestone because in Barito Kuala District the land that was used as rice farming had soil acid content, which was between 4 - 6 Ph soils. So that farmers reduce the acidity of the soil for their farming activities by first using lime before planting rice farming.

SRG farmers mostly use Urea fertilizer with an average of 563.63 kg / farming and the fertilizer that uses the least is organic fertilizer with an average of 45.45 kg / farming because SRG farmers usually only use organic fertilizer for nutrient addition purposes for rice farming. Whereas the fertilizer most used by non-SRG farmers is Lime which is used to reduce levels of acidic soil with an average use of 194.20 kg / farming, the least use of fertilizer in non-SRG farmers is Organic fertilizer with an average use of 8, 69 kg / farming is also due to additional nutrients for rice farming.

Drugs costs. The drugs used by farmers amounted to 13 types consisting of liquid and solid drugs. The drugs used have several roles, namely as an insecticide, as a fungicide and as a leaf stimulant and grass medicine. Medicines used in rice farming in this study include Spontane, Gramaxone, Roundup, Footrop, Completion, Bio up, Green medicine, Green tonic, Rice goom, Bee green, Tillo 500 sc, Leili 2000 sc, and Glido. The cost of medicines used in SRG rice farming is calculated from one planting season, which is during the 9-month period of SRG farmers' rice farming with an average cost of IDR 1,312,2773 / farm (IDR 390,135 / ha). The cost of medicines used in non-SRG Padipetani farming is calculated from one planting season, which is for a period of 9 months with an average cost of IDR 201,695 per farm (IDR 160,890 / ha). The use of drugs is

generally done as a step to prevent pests. Spraying aims to prevent disease. Spraying is usually done in the morning, because at that time pests and diseases attack rice plants. Spraying is carried out 3-5 times in one growing season or for 9 months.

Labor outside the family. The cost of labor outside the family is calculated on a daily basis, with a magnitude of IDR 75,000 / day for male workers and IDR 60,000 / day for female workers. The types of work carried out starting from land and seedling activities, planting, fertilizing, weeding, HPT control, harvesting and transportation. The total average cost of labor outside the family of SRG farmers is IDR 6,038,180 / farming (IDR 1,884,323 / ha). The most widely used labor costs by SRG farmers, namely on planting and maintenance activities an average of IDR 5,288,181 / farming (IDR 1,572,162 / ha), this is due to land-processing and harvesting activities of SRG farmers use more mechanical labor. The cost of using non-SRG farmers outside the family for an average of IDR 2,597,607 / farm (IDR 2,072,259 / ha). The most widely used labor costs by non-SRG farmers, namely on land processing activities an average of IDR 1,332,089 / farming (IDR 1,031,791 / ha)

Tool Depreciation Costs. Depreciation costs in this study were calculated during one planting season, which is during the 9-month period of rice farming. Agricultural machine tools used in this study include hoes, handsprayers, plows, machetes, sickles, hand tractors, carvings and other equipment such as tarps, sacks and mats. SRG farmers and non-SRG farmers have similarities in the use of equipment in rice farming. Cost of depreciation of equipment owned by farmer respondents who use SRG on average is IDR 1,183,380/farming (IDR 351,815 / ha). The cost of depreciating equipment and supplies in this study owned by non SRG farmer respondents averaged IDR 587,737 / farm (IDR 468,830 / ha).

Costs for renting agricultural machinery. Land management and harvesting activities for SRG and non-SRG farmers are carried out using agricultural machinery, namely hand tractors for soil processing activities and combine harvester for harvesting activities. The cost of renting a machine (hand tractor) includes fuel in the amount of IDR 100,000, - / day, while the cost of renting a combined harvester is IDR 900, - / kg of grain. The average cost of renting a farmer machine in a soil processing activity using a hand tractor and harvesting using a combined harvester is IDR 9,350,363 / farming (IDR 2,779,837 / ha) and the average fuel cost is IDR 14,453, - / farming (IDR 50,000 / ha). While the average cost of leasing non-SRG farmers' agricultural machinery in land processing activities using a hand tractor and harvesting using a combined harvester is IDR 1,997,811 / farming (IDR 1,593,630 / ha) and the average fuel cost is IDR 22,826, - / farming (IDR 18,208, - / ha).

Grain storage costs in the implementation of SRG in Barito Kuala Regency are only incurred by farmers who use SRG with the cost of managing agricultural produce in the form of grain commodities amounting to IDR 193 / kg. In this study, the average total unhulled rice stored in the implementation of the warehouse receipt system (SRG) was 14,814 kg / farm (4,404 kg / ha). So that the SRG farmers issued an average cost of saving grain of IDR 2,859,189 / farm (IDR 850,029 / ha).

Seed Costs. In this study farmers used seeds from previous harvests. The average number of rice seeds used by SRG farmers was 35.90 kg / farm (10.67 kg / ha) with an average seed cost of respondent farmers amounting to IDR 5.824 / kg / farming (IDR 5.825 - kg / ha) . While the average number of non-SRG farmers' rice seeds is 14.95 kg / farming (11.93 kg / ha) with an average cost of farmers using SRG seeds of IDR 6,031 - kg / farming (IDR 6,029, - kg / ha).

Labor in the family. The cost of labor in the family is calculated on a daily basis, with a magnitude of IDR 75,000 / day for male workers and IDR 60,000 / day for female workers. The types of work carried out starting from soil and seedling activities, planting, fertilizing, weeding, HPT control, harvesting and drying. The total average cost of labor in SRG farm families is IDR 4,064,998 / farm (IDR 1,208,791 / ha). The most widely used labor costs by SRG farmers, namely the drying and storing of grain activities, an average cost of IDR 1,827,272 / farm (IDR 543,243 / ha), this is due to the activities of drying up to storing grain farmers SRG uses more labor in the family. The cost of using labor in the family of non-SRG farmers is an average of IDR 2,238,475 / farm (IDR 1,782,606 / ha). The most widely used labor costs by non-SRG farmers are in planting and maintenance activities with an average cost of IDR 748,695 / farm (IDR 597,225 / ha).

Land Rental Costs. The costs of renting land for respondent farmers, namely SRG farmers and non-SRG farmers in this study are included in the implicit costs because the status of land ownership cultivated by farmers is their own. Although the cost of own land, the cost of renting one's own land is still calculated, with the cost of renting per hectare of IDR 1,000,000. This is because the total amount of implicit costs incurred is not the same. The land rental costs incurred by SRG respondent farmers are IDR 3,363,636 / farming (IDR 1,000,000 / ha) and non-SRG farmers IDR 1,253,623 / farming (IDR 1,000,000 / ha) .

Capital Interest. The capital interest used in this study is included in the implicit costs because the respondent farmers use their own capital in running the farm and are obtained from the total average explicit costs multiplied by the Bank interest of 12.5%. In this study the results of the calculation of the amount of capital interest paid by SRG respondent farmers an average of IDR 3,132,843 / farming (IDR 931,386 / ha). While non-SRG farmers averaged IDR 780,467, - / farming (IDR 622,569, - / ha).

Total Farm Costs. The total cost is the result of the addition of the explicit and implicit costs used in the SRG and Non SRG rice farming activities in Barito Kuala Regency. In this study the explicit costs used by farmers in carrying out rice farming include the cost of fertilizer (urea, lime, phonska, organic and SP36), medicines, outside family labor, the cost of tool depreciation (hoes, handsprayers, plows, machetes, machetes, sickles, rubble) and equipment (tarpaulins, sacks and mats), as well as agricultural machinery rental equipment (Hand Tractor and Combine Harvester). Whereas for farmers who use SRG there is an explicit increase in the cost of storing milled unhusked rice (GKG) on the implementation of a warehouse receipt system in Barito Kuala Regency. While the implicit costs used by farmers in carrying out rice farming include the cost of seeds, labor in the family, capital interest of 12.5% per year and land rent. SRG and Non SRG farmers have the same implicit costs used in rice farming activities.

Reception. In the results of this study, SRG farmers had an average production of 10,118 kg / farm (3,008 kg / ha) with an average selling price of IDR 7,500 / farm (IDR 2,229 - / ha). The average non-SRG farmer production is 2,915 kg / farm (2,325 kg / ha) with an average selling price of IDR 7,000 / farm (IDR 5,583 / ha). It shows that the income of farmers using SRG is higher than non-SRG farmers. This is because the amount of production and the selling price of grain is higher per hectare per planting season.

Table No3: Average cost of production, grain selling price, and acceptance of the SRG and Non SRG rice farmers.

No	Component cost	SRG Farmer		Non-SRG Farmer	
		Number/ Farming	Total/ha	Number/ Farming	Total/ha
1	Production (IDR)	10.118	3.008	2.915	2.325
2	Price (IDR)	7.500	2.229	7.000	5.583
Average admission (IDR)		75.886.363	22.560.810	19.402.173	15.476.878

Source: Primary Data, 2019

In the SRG farmers' rice farming in this study, revenue in each planting season is IDR 75,886,363 / farming (IDR 22,560,810 / ha). The total cost is IDR 35,833,323 / farming (IDR 10,653,150 / ha). Therefore net income is IDR 40,053,040 / farm (IDR 11,907,660 / ha). In non SRG farmers' rice farming in this study, revenue in each growing season is IDR. 19,402,173 / farming (IDR. 15,476,878 / ha). The total cost is IDR 10,060,479 / farm (IDR 8,460,660 / ha). Therefore net income is IDR 8,795,649, - / farming (IDR 7,016,218, - / ha). From the results of this study it is known that net income of SRG rice farmers is higher than non SRG rice farmers. Due to the higher selling price of unhulled rice due to postponing sales by not directly selling the unhulled grain, but first storing it in the SRG warehouse.

Table No 4: Average cost of admission, total cost and net income of rice farmers SRG and Non SRG.

No	Component cost	SRG Farmer		Non-SRG Farmer	
		Number/ Farming	Total/ha	RP/ Usahatani	Number/ Farming
1	Revenue	75.886.363	22.560.810	19.402.173	15.476.878
2	Total Cost	35.833.323	10.653.150	10.060.479	8.460.660
Net income		40.053.040	11.907.660	8.795.649	7.016.218

Source: Primary Data, 2019

The results of the analysis of income differences using the T test analysis tool showed that T arithmetic was greater than T table, then Ho was rejected, meaning that the average income of SRG farmers was significantly different from the average income of Non SRG farmers in Barito Kuala Regency. The results of comparison of net income of SRG and Non SRG rice farmers during one planting season, namely during the 9-month period of rice farming.

Problems in the SRG implementation

In the implementation of the warehouse receipt system in Barito Kuala Regency there are several factors or obstacles that often occur that can affect SRR and Non SRG farmers as well as the management of storage warehouses covering socialization of SRG implementation only once a year and not all areas in Barito Kuala Regency are being socialized.

Meanwhile, the location of the warehouse is far from the production center, so the transportation costs are high. The limitation of grain storage facilities in the implementation of warehouse receipt systems, namely warehouse storage, is only available in 1 location, namely in the District of Mandastana, Puntik Village, Barito Kuala Regency

Another thing that makes farmers consider a lot of storage for the implementation of the warehouse receipt system is the storage costs in 2018 which increased compared to previous years. The increase that occurred due to fulfilling warehouse management operations included warehouse management fees and charges, namely in 2017 amounting to IDR 70.00, - / kg GKG, there was a significant increase in costs incurred by farmers in 2018 to IDR 193.00, - / kg GKG.

There are problems that arise now, especially in grain storage warehouses in the implementation of warehouse receipt systems, namely the existence of some ventilation or air ducts that are damaged.

IV. Conclusion

Based on the results and discussion it can be concluded as follows (a). The net income of the SRG farmers was IDR 40,053,040 / farm (IDR 11,907,660 / ha). While the average non-SRG farmer's net income is IDR 8,795,649 / farm (IDR 7,016,218 / ha), (b). T test analysis results show that the income of SRG farmers is significantly different from the income of non-SRG farmers, (c). The management of milled dry grain (GKG) commodity aims to assist farmers in delaying the sale and management of agricultural products and facilitate the provision of financing for farmers in carrying out farming activities (AI). Suggestions (a). To increase and increase farmers' incomes, the implementation of the SRG must be further maximized in helping farmers carry out a post-sale system, manage the yield of grain commodities and help facilitate financing for farming activities. However, in its implementation, the warehouse receipt system in Barito Kuala Regency must also provide market information, especially grain prices for farmers in order to obtain optimal income, in addition to the socialization of the functions and benefits of SRG carried out by related parties must be further improved so that it can be known by the public especially farmers in Barito Kuala Regency. Of course, with even outreach to farmers it is expected that more farmers will participate in using the warehouse receipt system in Barito Kuala Regency, (b). In addition, it is necessary to improve and add to the existing infrastructure in the implementation of the warehouse receipt system, especially the storage warehouse which currently has only 1 grain storage warehouse location. And the cost of grain storage that has increased must be adjusted to the conditions of farmers in Barito Kuala Regency. Therefore, it is necessary to coordinate the implementation of SRG by the relevant parties or institutions as well as the support and role of the local government of Barito Kuala Regency.

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