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Analysis of Competitiveness and Government Policy on Rice, Corn and Soybean Farming in Central Java Province

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Abstract

Rice, corn and soybean is the strategic commodities and the government always maintains their availability. Indonesia still imports rice, corn and soybean and implements the policy of tariffs, taxes and subsidies on rice, corn, soybean imports and farming inputs. Central Java is the main producer of rice, corn and soybean with the contibution of Gross Regional Domestic Product of the food crop sub-sector to the highest Provincial GRDP in Indonesian. This research examines the competitiveness and the government policy towards rice, corn and soybean farming in Central Java Province. It uses secondary data of Farming Economic Analysis from the relevant agencies and scientific publications on the international price of rice, corn and soybean that is analyzed using the quantitative descriptive method with analysis tool of Policy Analysis Matrix (PAM). The PAM result shows that the rice farming in Cilacap Regency and the corn farming in Grobogan Regency have competitive and comparative advantage. The soybean farming in Grobogan only has a comparative advantage. Overall the government policies are protective towards the rice farming in Cilacap, but not protective towards the corn and soybean farming in Grobogan. The sensitivity analysis shows that the advantages and competitiveness of the rice farming in Cilacap and the corn and soybean farming in Grobogan are sensitive towards the international price changes of commodities and fertilizers, the labor cost changes, the exchange rate fluctuations of Rupiah towards USD, and the import tariff changes of commodities.

Keywords: Competitiveness, Government Policy, Farming, PAM.

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INTRODUCTION

Rice is a strategic food crops because it is the staple food for the Indonesian people in general. Corn is one crop that can be used as human food and also as animal feed. The Ministry of Agriculture of the Republic of Indonesia recorded that from 2008-2011 the proportions of corn use from the total requirement are 40% - 50% as the raw material for the animal feed, 30% as the raw material for the food industry and the rest as a direct consumption. The national corn requirement for the animal feed industry is estimated to reach 7 million tons/year. Soybean is a raw material in the manufacturing of food and beverages such as *tempe*, *tahu*, soy sauce, milk and so forth. Indeed, soybean is so needed in other sectors that its availability is continuously managed and maintained by the government.

The commodities of rice, corn and soybean into the food crops are included in the national food self-sufficiency target commodities, but Indonesia is still importing these commodities to meet the national needs. This phenomenon also occurs globally where many countries around the world begin to put food self-sufficiency as the main target (Kone, 2015).

Based on the base data of import export of the Ministry of Agriculture of the Republic of Indonesia, Indonesia still imports the commodities of rice, corn and soybean from 2011 to October 2015. The highest rice import in 2011 reached 65.8 million tons. In 2012 and 2013 the rice import decreased and in 2014 increased again. Up to October 2015 the imports only reached 0.23 million tons. This occured because of the increase in national rice production rate in 2011 - 2013. The corn imports during these years fluctuated every year. The high rate of the corn imports would occur in 2012 when having a number of high productions and in 2014 when the production is temporary. The national soybean production is always below the imported one during 2011 to October 2015. This indicates that the national soybean production is unable to meet the national soybean needs, therefore the soybean imports tend to increase. The condition urged the government efforts to maintain the availability of the national food commodities, the national food price stabilization, and the increase in food crop productivity.

The imports of rice, corn and soybean commodities to the domestic need attention from the government so that the demand increase of these commodities in the domestic market does not lead to a decline in commodity price that can be detrimental to the farmers (Theriault, 2013). The cheap price of the rice, corn and soybean world commodities will benefit the consumers, but on the contrary will be detrimental to the farmers in the country. Meanwhile, the government has tried to protect the domestic producers / farmers through the provision of import and import tariffs.

The government's policy on commodities in the form of import tariffs on rice, corn, and soybean commodities is in accordance with the Regulation of the Minister of Finance No. 132 / PMK.010 / 2015. Besides the commodity policy, the government policy is also applied to the input of international traded farming. The policies related to farming inputs in the form of import tariff, import tax and subsidy policies are in accordance with the Regulation of the Minister of Finance No. 224 / PMK.011 / 2014 and the Regulation of the Minister of Agriculture of the Republic of Indonesia No. 122 / Permentan / SR.130 / 11/2013.

The commodities of rice, corn, and soyabean both the imported and domestic ones in the same market make the commodities compete with each other in order to survive in the market and to be desirable by the consumers (Fidele, 2015). Meanwhile, the commodities of rice, corn, and soybean in the domestic market are affected by the government policies.

Competitiveness is the ability of the manufacturer to produce a commodity at so low cost that the production activities are profitable at the prices from the international market (Simanjuntak, 1992: 16). Competitiveness can be measured from the comparative and competitive advantages. According to David Ricardo in Salvatore (1997: 3), although a country is less efficient or not superior absolutely in producing a commodity, a mutual beneficial trade can still be conducted. A country will import less efficient commodities when producing their own and will specialize in the production to export the commodities having smaller losses.

Based on Michael Porter's theory of competitive advantage, not only the internal factors of the production activity that determine a commodity with competitive advantage in the international market, but also the external factors such as the level of world market demand and policies both domestic and international (Grant, 1997: 540). Each instrument of agricultural policy will lead to a transfer between the producers or farming, the consumers, and the government (Pearson, 2005: 8). This transfer will affect the profitability and competitiveness of the farming.

Central Java is one of the major producers of rice, corn, and soybean with the contribution from the food crop sub-sector of GRDP to the highest Provincial GRDP in Indonesia. On average, the donation of the food crop sub-sector of GRDP in Central Java during 2009 to 2013 is 12.54%. The structure of GRDP in Central Java province in 2013 was dominated by the industries of manufacturing, trade, and agriculture. The Central Bureau of Statistics in Central Java Province recorded that the agricultural sector has contributed the third largest one to the formation of the value of GDP in Central Java, but it has become the largest labor absorber, in which about 36% of the workforce are in the agricultural sector.

Cilacap is a regency with the highest rice production in Central Java. Meanwhile, Grobogan is a regency with the highest corn and soybean productions in Central Java.

Table 1 below shows the five regencies with the highest productions and five others with the lowest productions for the commodities of rice, corn, and soybean in Central Java Province. The regency with the highest production of rice is Cilacap, while the one with the highest production of corn and soybean is Grobogan.

Cilacap Regency has the largest harvest land in Central Java for the rice commodity. Grobogan Regency also has the largest harvest land in corn and soybean agricultural commodity.

Cilacap and Grobogan become the main contributors to the commodity productions of rice, corn, and soybean in the domestic market of Central Java Province. Under these conditions, Cilacap and Grobogan become the strategic areas of the agricultural commodity producers of rice, corn, and soybean in Central Java. It is very interesting to observe and asses the competitiveness and the government policy on farming (Olagunju, 2013).

Table 1. The Average of the Highest and Lowest Productions of Rice, Corn and Soybean in 5 Regencies / Cities in Central Java in 2011-2013 (in tons)

Regencies/Cities	Rice Production	Regencies/Cities	Corn Production	Regencies/Cities	Soybean Production
Cilacap	745.246	Grobogan	572.142	Grobogan	40.586
Grobogan	646.917	Wonogiri	305.048	Wonogiri	25.539
Demak	599.825	Blora	249.546	Demak	9.727
Brebes	577.133	Kendal	179.568	Blora	7.465
Pati	573.603	Rembang	199.091	Kebumen	6.468
Pekalongan	15.386	Salatiga	1.506	Magelang	0
Salatiga	7.586	Surakarta	38	Magelang	0
Tegal	5.707	Magelang	7	Semarang	0
Magelang	2.941	Pekalongan	0	Pekalongan	0
Surakarta	1.127	Tegal	0	Tegal	0

Source : The Central Bureau of Statistics of Central Java in Numeric (Processed)

This research would like to express the phenomenon of the agricultural economics and the government policy. The phenomenon is related to the competitiveness of farming and the government policies towards the farming of rice, corn, and soybean commodities especially in the province with the highest production in Central Java.

RESEARCH METHODS

In this research there are input and output variables in one unit of farming of rice, corn, and soybean commodities in Central Java Province. The input and output variables of farming in PAM analysis are divided into two types, the tradeable and non-tradeable (domestic) variables. The tradeable variable is a variable of commodities traded in the international market. In this research the tradeable variables are the commodities of rice, corn, and soybean, Urea, TSP, NPK and Superphos fertilizers, seeds, pesticides, herbicides etc. On the contrary, the non-tradeable variable is a variable that is not traded internationally such as labor, land and capital. This research uses the secondary data, the Analysis of Farming Economics of rice in Cilacap, and the Analysis of Farming Economics of corn, and soybean in Grobogan, each in the planting period of October 2014 - March 2015. The analytical data above is created by the Department of Agriculture of Food Crops and Horticulture in Central Java Province.

The analytical data provides the information on the quantity, price, and budget of the private input and output (actually incurred) of the farming in one regency on average, while the quantity, price, and budget of the social input and output (that should be incurred if there is no government policy or market distortion) are obtained based on the observation of the studied areas through the secondary source such as the Department of Agriculture of Food Crops and Horticulture in the Regency, the international publication of the price of tradeable input-output, the publication on distribution and marketing costs of agricultural tradeable inputs, the publication on national agricultural policies and agricultural policy.

This research uses an analytical tool of PAM (Policy Analysis Matrix). PAM is an analytical tool used to determine the economic efficiency and the amount of incentive or intervention in various farming activities as a whole and in a systematic way. In this research PAM compiles a matrix containing the informations of costs, revenues and profits of private and social of the farming of rice, corn, and soybean commodities in a regency with the highest production in Central Java. The informations of costs, revenues and profits of private and social of the farming provides the farming competitiveness indicators those are comparative and competitive advantages. Besides, the government policy on the rice, corn, and soybean farming in the regencies with the highest production in Central Java can be calculated through the information under the analysis of PAM. It can be used on the farming with different regions, types, and technology. Besides, it can also be used to determine whether a policy can improve the competitiveness of the farming of a commodity produced through the creation of business efficiency and revenue growth (Setiawan, 2011).

The table of PAM can show the indicator of profitability, competitiveness and the impact of government policy. In this research, the analyzed profitability indicator is the private and social profits. The analyzed farming competitiveness indicator is the comparative and competitive advantages. The indicator of government policy accepted by the farming can be analyzed through the indicators of input-output policy and the input and output policy can be calculated through the information under PAM.

Besides, this research simulates the profit sensitivity of competitiveness and government policies towards the changes in the international trade variables and the changes in prices of farming inputs such as the commodity international prices, the fertilizer input international prices, the labor wages, and the exchange rate of Rupiah towards US dollar. The indicators of competitiveness and the impact of government policy in the table of PAM are as follows: (1) The profitability of farming analyzed through private and and social profits. The competitiveness of farming is analyzed through the indicators of competitive and comparative advantages. (2) The analysis of government policies affecting the rice, corn, and soybean farming in Central Java Province consists of the input policy, the output policy and the input-output policy. (3) The Sensitivity Analysis, which indicates that the advantages and competitiveness of farming is sensitive to variables of international trade and changes in domestic input costs.

RESULTS AND DISCUSSION

Farming Competitiveness is the ability of the rice farming in Cilacap Regency, and the corn and soybean farming in Grobogan Regency to survive in the domestic market, especially the market of Central Java. The analysis of PAM of rice, corn, and soybean farming in Central Java Province produces the profitability indicators in the form of private and social profits and the competitive indicators in the form of competitive and comparative advantage.

The farming profitability indicators show that the rice farming in Cilacap has the profit of 4.85 million Rupiah even if there is no government policy and has the private profit of 24.49 million Rupiahs with the government policy. This implies that the rice farming in Cilacap is able to expand.

Table 2. Competitiveness Indicators of Commodity Farming of Rice, Corn, and Soybean in Central Java Province

Farming	Social Profits (millions)	DRC	Private Profits (millions)	PCR
Rice				
Cilacap	Rp 4.84	0.79	Rp 24.5	0.25
Corn				
Grobogan	Rp 3.70	0.84	Rp 9.9	0.43
Soybean				
Grobogan	Rp 3.70	1.18	Rp 9.9	0.43

Source : PAM Result, Processed

The farming competitiveness indicators are Domestic Resources Cost Ratio (DRCR) and Private Cost Ratio (PCR). The rice farming in Cilacap has a value of DRC <1 that is 0.79, which means that to obtain an additional value output of 1 million Rupiahs, the rice farming in Cilacap requires the additional domestic factor costs of 790 thousand Rupiahs. Based on the DRC value, the rice farming in Cilacap has been so efficient in using its domestic resources at the world prices that it has a comparative advantage. The rice farming in Cilacap has a value of PCR <1 that is 0.25, which means that to obtain the additional value output of 1 million Rupiahs, the rice farming in Cilacap requires the additional domestic factor costs of 250 thousand Rupiahs at the actual price. Based on the PCR value, the rice farming in Cilacap has been so efficient in using its domestic factors over the actual price that it has a competitive advantage.

The farming profitability indicators show that the corn farming in Grobogan has the profit of 3.7 million Rupiahs even if there is no government policy and has the private profit of 10.2 million Rupiahs with the government policy. This implies that the corn farming in Grobogan is able to expand.

The corn farming in Grobogan has a value of DRC <1 that is 0.84, which means that to obtain the additional value output of 1 million Rupiahs, the corn farming in Grobogan requires the additional domestic factor costs of 840 thousand Rupiahs. Based on the DRC value, the corn farming in Grobogan has been so efficient in using its domestic resources at world prices that it has a comparative advantage. The corn farming in Grobogan has a value of PCR <1 that is 0.38, which means that to obtain the additional value output of 1 million Rupiahs, the corn farming in Grobogan requires the additional domestic factor costs of 380 thousand Rupiahs at the actual price. Based on the PCR value, the corn farming in Grobogan has been so efficient in using its domestic factors over the actual price that it has a competitive advantage. The farming profitability indicators show that the soybean farming in Grobogan has suffered a loss of 3.7 million Rupiahs even if there is no government policy and has the private profit of 13.6 million Rupiahs with the government policy. This implies that the soybean farming in Grobogan is not be able to survive without the government policy. The farming competitiveness indicators are Domestic Resources Cost Ratio (DRCR) and Private Cost Ratio (PCR). The soybean farming in Grobogan has a value of DRC <1 that is 1.18, which means that to obtain the additional value output of 1 million Rupiahs, the soybean farming in Grobogan requires the additional domestic factor costs of 1.18 million Rupiahs. Based on the DRC value, the soybean farming in Grobogan is so inefficient in using its domestic resources at the world prices that it does not have a comparative advantage. The soybean farming in Grobogan has a value of PCR <1 that is 0.43, which means that to obtain the additional value

output of 1 million Rupiahs, the soybean farming in Grobogan requires the additional domestic factor costs of 430 thousand Rupiahs at the actual price. Based on the PCR value, the soybean farming in Grobogan has been so efficient in using its domestic factors over the actual price that it has a competitive advantage.

The government policies on the commodity farming of rice in Cilacap and of corn and soybean in Grobogan in competing with the comparable imported commodities can be assessed through the indicators of output policy, input policy, and input-output policy as follows:

Table 3. Government Policy on Commodity Farming of Rice, Corn, and Soybean in Central Java Province

Indicators	Rice Farming in Cilacap Regency	Corn Farming in Grobogan Regency	Soybean Farming in Grobogan Regency
OT	8.049.648	-9.150.305	-3.153.695
NPCO	1,30	0,67	0,86
IT	-1.285.936	-2.385.877	-340.121
NPCI	0,64	0,51	0,85
TF	-10.311.305	-13.270.073	-16.419.064
PC	5,05	2,76	-2,676
EPC	1,40	0,71	0,861
SRP	0,72	0,23	0,61
NT	19.646.889	6.505.645	13.605.490

Source: PAM Result, Processed

On the contrary, the tariff policy on the corn and soybean imports raise implicitly the subsidy to the consumers of corn and soybean so that the consumer surplus increases and the surplus of corn and soybean farming decreases by the value of the Output Transfer. This means that the government policies are protective to the consumers but not protective to the corn and soybean farming in Grobogan because the consumers have to pay low high for buying the corn and soybean.

The rice farming in Cilacap has NPCO value> 1 that is 1.30. The corn farming in Grobogan has NPCO value> 1 that is 0.67, while the soybean farming in Grobogan has NPCO value <1 that is 0.86. Such conditions indicate that the import tariff policy has made the total output value of the rice farming in Cilacap 30% higher than it should be if there is no import tariff policy. On the other hand, the government policy has made the total output of corn and soybean farming in Grobogan respectively 67% and 86% lower than it should be if there is no import tariff policy.

Furthermore, the input policy as the government policy to affect the agricultural production inputs such as subsidies or taxes imposed on the farming raw materials that can be assessed through an indicator that is the Input Transfer (IT).

Based on the IT value, it explains that the government policy towards the tradeable input has made a surplus in each farming as the the tradeable input consumer and the reduced surplus of the tradeable input producer by the negative IT value. The IT value of each farming is as follows: the rice farming in Cilacap is negative 1.286 million Rupiahs, the corn farming in Grobogan is negative 2.386 million Rupiahs and the soybean farming in Grobogan is negative 340 thousand Rupiahs. The IT value also indicates the amount of the government transfers to the farming through the tradeable input producers.

Furthermore the Nominal Protection Coeficient Input value (NPCI) indicates the different ratio between the tradeable input prices with the social price. The NPCI values of each farming is as follows: the rice farming

in Cilacap is 0.64, the corn farming in Grobogan is 0.51, the soybean farming in Grobogan is 0.85. The NPCI value also indicates the magnitude of the tradeable input load tradeable that is paid after there is government policy. The rice farming in Cilacap only pays the tradeable input cost of 64% of the supposed costs if there is no government policy. Similarly, the corn and soybean farming in Grobogan, each only pays 51% and 85% of the supposed tradeable input costs if there is no government policy.

The Transfer Factor Value in this research is due to the opportunity cost of the land use. On the rice farming in Cilacap, the opportunity cost of land use is the cost sacrificed because of using the land for the rice farming rather than the alternative commodity besides rice like corn. The corn has been selected because besides the rice commodity, the residents in Cilacap also grow corn. While in the corn and soybean farming in Grobogan, both crops are the mutual commodity alternative with the opportunity cost of land use.

The Transfer Factor Value of the rice farming in Cilacap is negative 10.311 million Rupiahs that reduces the surplus of the rice commodity farming implicitly. The Transfer Factor Value of the corn and soybean farming in Grobogan is each negative 13.27 million Rupiahs and negative 16.419 million Rupiahs. The value of the farming reduces implicitly the surplus on each commodity.

Then the input-output Policy can see the combined impact of the tradeable input policy and the commodity policy through an indicator that is the Net Transfer (NT).

The Net Transfer Value of the rice farming in Cilacap is Rp 19.647 million, so all transfers resulting from the government policies are Rp 19.647 million. The Net Transfer Value of the corn farming in Grobogan is Rp 6.506 million, so all transfers resulting from the government policies are Rp 6.506 million. The Net Transfer Value of the soybean farming in Grobogan is Rp 13.605 million, so all transfers resulting from the government policies are Rp 13.605 million.

The Profitability Coeficient Value of the rice farming in Cilacap and the corn and soybean farming in Grobogan respectively is 5.05; 2.75; 2,676. This means that the Net Transfer on the rice farming in Cilacap and the corn and soybean farming in Grobogan deliver private profits respectively 5,05; 2.75; 2,676 times larger than it should be if there is no policy transfer.

The Effectivity Policy Coeficient Value of the rice farming in Cilacap> 1 that is 1.40, then the government policy is effective to protect the rice farming in Cilacap. Different from the EPC value of the rice farming in Cilacap, the EPC value of the corn and soybean farming in Grobogan <1 respectively is 0.71 and 0.86, then the government policy is not effective in protecting the corn and soybean farming in Grobogan.

The Value of Subsidy Ratio for Producer of the rice farming in Cilacap is 0.72, which means that the Net Transfer will occur with the import tariff of 81% when no other divergences. The Value of Subsidy Ratio for Producer of the corn farming in Grobogan is 0.23, which means that the Net Transfer will occur with the import tariffs of 23% when no other divergences. The Value of Subsidy Ratio for Producer of the soybean farming in Grobogan is 0.61, which means that the Net Transfer will occur with the import tariffs of 61% when no other divergences.

Furthermore, the sensitivity analysis examines how competitiveness, profits and government policies are sensitive to the changes in the international trade variables and the changes in farming input prices. These changes have been selected based on the changes in economic phenomena that occur.

Based on the results of the sensitivity analysis of the rice farming in Cilacap and the corn and soybean farming in Grobogan, the increase in the international prices of rice, corn, and soybean respectively 12%, 16% and 11% lead to social profits and increased comparative advantage competitiveness. This condition occurs because the price increase makes the selling price of domestic commodities also increase, so the rice commodity (in the form of rice) in Central Java can compete at a high price. The increased labor costs make the social profits, private profits and competitive comparative advantages decline, while the depreciation of the exchange rate makes the social profits and the comparative advantage competitiveness decrease. This condition occurs because the rising labor costs and the increase in the exchange rate also led to a rise in input costs of tradeable farming. The increase in commodity prices due to the increased exchange rate does not really affect the farming like the increase in tradeable input costs.

The increase in input prices of fertilizers is as follows: Urea 9%, TSP 7%, Superphose 6%, and NPK 2%. This increase does not significantly affect the competitiveness and the rice farming in Cilacap, but make the social profits of comparative advantage competitiveness of the corn and soybean farming in Grobogan decline due to increased tradeable input costs. The international input price increase makes the government protection decline especially in the fertilizer input subsidy. The increase in the import tariff on rice of 650/ kg cannot protect the rice farming in Cilacap rather than when the import tariff on rice is only 450/kg but it can protect the soybean farming in Grobogan and increase the private profits and the competitive advantage.

CONCLUSION

From the results of research and discussion by using the competitiveness and the government policy on rice, corn, and soybean farming in Central Java Province, it can be concluded as follows:

The rice farming in Cilacap remains profitable in conditions there is or there is no government policy, and it has the comparative and competitive advantages. The corn farming in Grobogan remains profitable in conditions there is or there is no government policy, and it has the competitive and comparative advantages. The soybean farming in Grobogan remains profitable in conditions there is government policy, but it suffers a loss if there is no government policy. So the corn farming in Grobogan has a competitive advantage but has no comparative advantage. The government policy is effective to protect the rice farming in Cilacap, but it is not effective in protecting the corn and soybean farming in Grobogan.

The increase in commodity prices has an impact on the increased profits and competitiveness of the rice farming in Cilacap and the corn and soybean farming in Grobogan. The increase in international fertilizer prices and in labor costs results in a decline in profits and competitiveness of the rice farming Cilacap and the corn and soybean farming in Grobogan. The

depreciation of exchange rate of Rupiah against the US dollar led to a decrease in losses and an increase in competitiveness and a social losses of the soybean farming in Grobogan, but it makes the competitiveness in rice farming and corn farming decrease. The increase in import tariffs decrease the profits and competitiveness of the rice farming Cilacap, but increase the profits and competitiveness of the corn farming in Grobogan and decrease losses and increase the competitiveness of the soybean farming in Grobogan.

Based on the competitiveness of rice farming in Cilacap with its competitive and comparative advantages, then it would be better to produce the rice in Cilacap rather than importing it. Similarly, because the corn farming in Grobogan has the competitive and comparative advantages, it would be better to produce the corn in Grobogan rather than importing it. While for the soybean commodity that has a competitive advantage but does not have a comparative advantage, then it would be better to import the soybean rather than producing it in Grobogan. For the farming in each Regency especially the soybean farming in Grobogan, it is important to increase the efficiency of production input usage and also the agricultural production output in order to increase the competitive and comparative advantages.

The government needs to reassess its policies that do not protect the farming and affect the of farming surplus decrease and implement the policies that are protective to the farming. Especially for the corn and soybean farming in Grobogan that produce commodities of industrial raw materials, such farming should receive more additional values from the production of industrial commodities. As for the rice farming in Cilacap that produces commodities for the consumption of the majority of society, the government needs to assess and implement the policies that increase the consumers' surplus and maintain the stability of the domestic rice prices.

The government as the authority of deciding the commodity import of rice, corn, and soybean importantly needs to pay attention to the changes in the variables of international trade that give impact on the increase or decrease in the competitiveness of farming such as the changes in the international prices of commodities and inputs and also the changes in the exchange rate of Rupiah against US dollar, and also the changes in the input variables of farming that is the labor price wages.

Therefore, to anticipate it, the government must change the protection policies on the farming such as the changes in import tariffs by taking into account the condition of the domestic market.

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