EXAMINING OF PRODUCTION, CONSUMPTION, IMPORTS AND THE EFFECT ON SUGAR SELF-SUFFICIENCY

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ABSTRACT

One of the problems faced by Indonesia, which lies in the industrial sector of sugar, that sugar production in the country that cannot meet consumption needs, so do imports from several countries. There is a huge opportunity to improve the national sugar production. Increased production of sugar to meet domestic needs have been programmed by the government through sugar self-sufficiency program. At first, self-sufficiency is to be achieved in 2014, but a number of considerations, postponed until 2019. Self-sufficiency has several benefits, among others; (a) increase the income of sugar cane farmers; (b) to be independent from the State (importers); (c) to create new jobs, and; (d) save on the use of foreign exchange. Although self-sufficiency has strategic benefits, but there are some constraints, namely; (a) sugar factories generally are old; (b) the total area of sugarcane plants dwindling; (c) the price of sugar on the world market is relatively cheap, so employers tend to be happy import, and; (d) it is difficult to get adequate land as possible to increase the production of sugar cane, mainly in Java.

The data were analyzed using multiple linear regressions, that the sugar production is positively correlated with the total area of the sugar cane crop, but negatively correlated with the volume of imports. This finding reinforces the self-sufficient, that the national sugar production can be increased through increased production and reduced imports of sugar cane. Another fact, domestic sugar consumption was positively correlated with domestic production and imports. This means that imports of sugar can be omitted if the national production has been able to self-sufficiency. For the success of self-sufficiency program is deemed necessary to improve the governance of the national sugar. In this case there is a choice, continuing the pattern of the core estate and smallholder (PIR), which is already applied, or implementing contract farming or cooperative farming.

Keywords: self sufficiency, welfare of farmers, PIR, contract farming, cooperative farming.

INTRODUCTION:

Sugar is one of the important food commodities after rice in Indonesia. Sugar consumption is getting higher every year. The consumption increase is not proportionate to domestic production. Granulated sugar is a food source of calories which ranks fourth after cereals, animal food and oil and grease, with a market share of 6.7%. Sugar is also one of the main sweetening agents and has been used extensively, both for household consumption and as raw material for the food industry (Sugiyanto, 2007). Consumers are more and more sugar in line with population growth and industrial growth in the food and soft drinks.

The development of the industrial sector will stimulate economic growth in order to offset population growth. At the same time, the growth of the industry to create new jobs, boost gross domestic product and per capita income. On the other hand, the growth of the industry can reduce the volume of imports. National sugar requirement currently reaches 5.7 million tons. The sugar requirement consists of 2.8 million tons of white sugar (GKP) for direct public consumption and 2.9 million tons of refined sugar crystals (GKR) to meet the needs of the industry. The sugar demand will continue to increase as population growth, the development of food and beverage industry, hotels, restaurants and others (Ministry of Industry of the Republic of Indonesia, 2016). The level of sugar consumption in Indonesia exceeded the level of production, to meet the national sugar stock, then do import. The realization of the production, consumption and imports are presented in the following table providing information regarding opportunities to improve national sugar production as a substitute to sugar imports over the years.

Table 1: Production, Consumption and Imports (2001-2015)

Years	Sugar production	Consumption (Tons)	Import (Tons)
2001	1.725.467	3.250.000	1.284.469
2002	1.755.354	3.300.000	970.926
2003	1.631.918	3.350.000	997.204
2004	1.725.467	3.400.000	1.284.469
2005	2.241.742	3.420.000	1.980.487
2006	2.051.644	3.460.000	1.405.942
2007	2.517.374	3.750.067	2.972.788
2008	2.694.227	3.508.000	983.944
2009	2.517.374	4.850.109	1.373.564
2010	2.290.116	4.289.000	1.382.525
2011	2.267.887	4.670.770	2.371.249
2012	2.591.687	5.200.000	2.769.239
2013	2.551.026	5.516.470	3.344.304
2014	2.632.242	5.692.096*	3.450.775*
2015	2.726.393	5.895.693*	3.574.204*
Growth (%)	3,89	4,86	16,64
Average	2.261.328	4.236.814	2.009.739

*) Estimation
Source: Ministry of planning / National development planning agency (2016)

Growth of average consumption of the period 2001-2015 amounted to 4, 86% with an average consumption volume of 4,236,814 Tons. On the other hand, production actually only increased by 3.89% with a production rate of 2,261,328 Tons. This phenomenon resulted in increased imports to meet domestic consumption amounted to 16, 64% with the average volume of 2,009,739 Tons. The fact is clear that there is a deficit, or the difference between the needs of domestic consumption with production of sugar.

Over the span of the last eight years, consumption of sugar increased by 8.54% with an average volume of 4,952,767. On the other hand, does not follow the consumption of sugar production. That the only production growth of 0.42% with an average of 2,533,869 tons. The deficit amounted to 31.65% or 241,889,816 Tons. The results indicate the existence of a deficit of investment opportunities to increase production capacity of sugar factories. Deficit figure that exceeds the ability of domestic production led to increased imports of sugar in an attempt to meet the needs of domestic consumption. The sugar factory in Indonesia based distribution, 48

factories located on the island of Java and the remaining 15 are outside Java, especially in Sumatra.

Table 2. Production, Consumption and Deficit (2008-2015)

Years	Consumption (Tons)	Production (Tons)	Deficit	
			(Tons)	(%)
2008	3.508.000	2.694.227	81.377.300	4,21
2009	4.850.109	2.517.374	233.273.500	12,05
2010	4.289.000	2.290.116	199.888.400	10,33
2011	4.670.770	2.267.887	240.288.300	12,42
2012	5.200.000	2.591.687	260.831.300	13,48
2013	5.516.470	2.551.026	296.544.400	15,32
2014	5.692.096	2.632.242	305.985.366	15,81
2015	5.895.693	2.726.393	316.929.963	16,38
Growth (%)	8,54	0,42	31,65	31,65
Average	4.952.767	2.533.869	241.889.816	12,50

Source: Ministry of planning / National development planning agency (2016)

Most of the sugar factory is old, there's even older than 100 years. Thus, the national sugar factory productivity is very low, until 2016 only 63 pieces of the plant are still in operation. Problems faced at the national self-sufficiency is: (1) The sugar factory which there are mostly old and low productivity, (2) The area for the development of the sugar cane crop has been limited, primarily in Java; and (3) Provision of raw materials supplied mostly by sugar cane plantations sugarcane and sugarcane fields at times transformed to enable to plant more profitable crops (Indonesia Sugar Annual Report, 2016).

LITERATURE REVIEW:

The type of Sugar in the trade:
Based on the type, sugar traded are: (a) Plantation White Sugar (GKP); (b) raw sugar (GKM); and (c) of refined sugar (GKR) (Decree of the Minister of Industry and Trade No. 61/ MPP/Kep./2/2004). Plantation White Sugar is sugar that has been processed and can be directly consumed by households. GKP is a result of production of domestic sugar mills in general. Raw sugar is sugar intermediate, which are generally imported from abroad. GKM is the raw material to be processed into the RCC and also processed into GKP. While refined sugar (GKR) is produced from plant sugars refined sugar for industrial use food and beverages and drugs (pharmaceuticals). GKP in Europe and America are generally produced from sugar-beet crop, while in tropical countries generally made from sugar cane (sugarcane), such as Indonesia, Thailand, Vietnam, India, Pakistan, Brazil, and Cuba.

Sugar processed from sugarcane is generally preferred by consumers. Cane sugar is sweeter and more crystals are white and shiny. RCC is a type of sugar that is destined for the food and beverage industry and not for household consumption. Therefore, the food and beverage industry has been growing rapidly; the need for refined sugar is also increasing. For insufficiency of the government to import raw sugar.

Sugar self-sufficiency:
Self-sufficiency can be defined as the ability to meet all kinds of needs. Self-sufficiency is the ability to meet the needs of the sugar in the country with its own production without the need to bring in import (Ilham *et al.*, 2011). Sugar self-sufficiency is important, because if Indonesia was able to self-sufficiency, Indonesia no longer need to meet national consumption needs through imports. Foreign exchange funds previously used to import sugar can be used to import other products, including the purchase of capital goods for the development of the industrial sector. Self-sufficiency is the ability of domestic sugar production to meet the needs of society sugar consumption either directly or indirectly. Self-sufficiency do the following reasons: (a) to maintain national food security (national food security), (b) maximize utilization of the capacity of sugar factories, namely capacity sugar mill 197 thousand tons per day (TTH), (c) developing a sugar factory the domestic potential that should meet the needs of national sugar consumption, and (d) save foreign exchange to finance imports of sugar. So basically, self-sufficiency is very important, because in addition to self-sufficient national sugar requirement, also the activities of foreign exchange savings. Foreign exchange previously used to import sugar can be used to finance other activities are more strategic (Surono, 2006).

Self-sufficiency for public consumption (GKP) actually been achieved in 2008 on the production of 2.7 million

tons. But the self-sufficiency target until 2015 to meet the needs of the community (GKP) and industry (GKR) has not reached the target, so we need to increase production significantly. Therefore, it is expected there will be construction of 10-25 new sugar factory in order to increase production by about 3.1 million tons of sugar, either by the state-owned factories and private property (Bappenas, 2015). Sugars including food commodities were programmed to achieve self-sufficiency. This self-sufficiency can be achieved through increased production of national production.

The increase in production is in addition to meet domestic consumption, is also intended for the purpose of import substitution and increased incomes, sugarcane (Strategic Plan of the Ministry of Agriculture from 2015 to 2019). The Indonesian government continues to develop commodity sugar cane in the region centers sugarcane crop development through budget allocations and activities aimed to increase sugar production. Area used as centers of development of sugarcane, among others, Aceh, North Sumatra, West Sumatra, Jambi, South Sumatra, Lampung, West Java, Central Java, East Java, DI.Yogyakarta, South Sulawesi and Gorontalo. In other parts of the government is to make the province of Aceh, West Sumatra and Jambi as brown sugar producing region with regard to the potential of land, capabilities and needs of the center of the region is suitable and appropriate for the development of brown sugar as raw material for household scale industries.

Technical conditions of sugar cane Plant:

The plant can grow cane with fertile soils and climate. The sugar cane plant grows in tropical and sub-tropical until the boundary line between the 20^0 Celsius, namely isotherm $190^{LU} - 350^{LS}$. A good soil conditions for the sugar cane plant is not too dry and not too wet, and the sugar cane plant roots are very sensitive to lack of air in the soil so that irrigation and drainage should be noted. Good drainage with a depth of about 1 meter provides plant roots absorb water and the elements of the required elements deeper layer on growth of crops during the dry season are not disturbed. Good drainage and in can also to distributed the wet season so that the excess water does not occur puddles that can inhibit growth the plant due to depletion of oxygen in the soil (Indrawanto, 2010).

Judging from the type of soil, plant sugar cane can grow well in different types of soil such as alluvial soil, grumosol, latosol and regusol with an altitude between 0-1400 meters above sea level. But the most suitable land is less than 500 meters above sea level. Meanwhile, at an altitude > 1200 m above sea level is relatively slow plant growth. The slope should be less than 8%, although the slope of up to 10 % can also be used for localized areas. Best soil conditions for sugarcane is a long sloping, flat and sloping up to 2% if the soil is light and up to 5 % if the soil is heavier.

METHODS:

This study using by secondary data period 1990-2015. This secondary data obtained through research of documents, both on Indonesian, Central Bureau of Statistics (BPS) as well as at the Ministry of Agriculture and the related institutions. The data were analyzed by descriptive methods of correlation and regression analysis with SPSS. Regression equation used is:

$Y = b_o + b_1X_1 + b_2X_2 + e.$ (1)

$Y = b_o + b_1X_1 + b_2X_2 + e$ (2)

Equation (1):
- Y = sugar consumption (tonnes).
- X_1 = sugar production (tonnes).
- X_2 = import sugar (tonnes)
- b_o = intercept function
- $b_{1,2}$ = estimated.
- e_1 = the regression error

Equation (2):
- Y = sugar production (tonnes).
- X_1 = wide sugar cane crop area (ha).
- X_2 = import sugar (tonnes).

RESULTS:

Relationships of consumption, production and import:

Sugarcane is the raw material for making sugar. Processing of sugar cane to produce sugar, also gives some byproduct. The main by product molasses, alcohol and spirits. Molasses is the raw material of the product flavorings. This study focuses only on sugar products.

Table 3: Parameters Regression of consumption, production and Import

Variable	Coefficients	$t_{statistic}$	Sig.
Constant	1,599	1,296	0,208
sugar production	0,507	3,709	0,001
sugar import	0,575	4,210	0,000
ARS = 0,534	Sig = 0,000[b]		
	$F_{statistic}$ = 15,317		

a. Dependent Variable: consumption

*ARS = Adjusted R Square

Source: Parameter estimates SPSS output

Based on those results, then the regression equation obtained, that Consumption = 1,599 + 0,507 Production + 0,575 Import. A coefficient of b_1 have significance with p = 0.001 < 0.05 sugar production (domestic sugar) has a significantly affect on consumption. Likewise, the b_2 has a significance p = 0.000 < 0.05, so import have a significantly affect sugar consumption. Those imports of sugar have influence 57.50% against a national consumption of sugar, and sugar production (domestic) only has influence 50.70%. This means that domestic sugar consumption needs are met from imports.
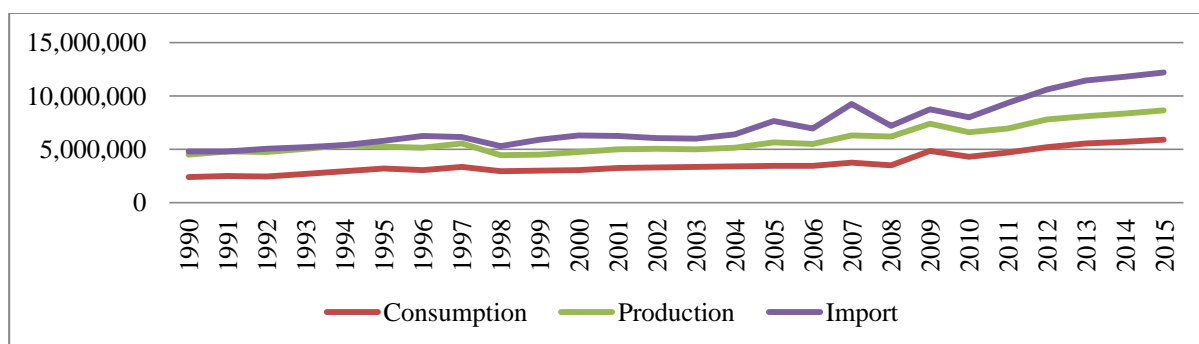

Figure 1: Consumption, production and import

Relationships of production, sugarcane area and Import:

The land area of sugar cane into trigger of production. Sugar production relies heavily on stocks of raw materials produced sugar cane plantations. In addition, the increase in domestic consumption, both for households and for the industrial sector, encourages increased domestic sugar production. Increased sugar production can be a vehicle for import substitution, while saving foreign exchange expenditure.

Table 4: Parameters regression of production, sugarcane area and import

Variable	Coefficients	$t_{statistic}$	Sig.
Constant	-1,184	-1.131	-0.196
sugarcane acreage	0.880	8.470	0.000
sugar import	-0.162	-1.556	0.133
ARS = 0.736	Sig = 0,000[b]		
	$F_{statistic}$ = 35.909		

a. Dependent Variable: sugar production

*ARS = Adjusted R Square

The results show that the equation of regression, sugar production = -1,184 + 0,880 sugarcane acreage – -0,162 Imports of sugar. The coefficient b_1 is significance P = 0.000 < 0.05, so the total area of sugarcane (ha) a significant influence on domestic sugar production. The coefficient b_2 P = 0, 133 > 0.05, so that the sugar imports are not significant influence on domestic sugar production. The coefficient b_2 has a negative insignificant. This means that the correlation between imports of sugar and sugar production in the country is negative. If the import is reduced, then the production will go up. But if imports increase, the domestic production will be reduced. Effect of sugarcane land area to the level of sugar production is quite large, which is 88%. Import of sugar has little effect, which is only 16, 20%. The results of this analysis show, if you want to

increase sugar production in the country, it must increase the sugarcane crop area. This becomes very important information for the implementation of self-sufficiency. To encourage increased domestic production of sugar, the sugar mills belonging to the State and the private property of need to expand sugarcane acreage.
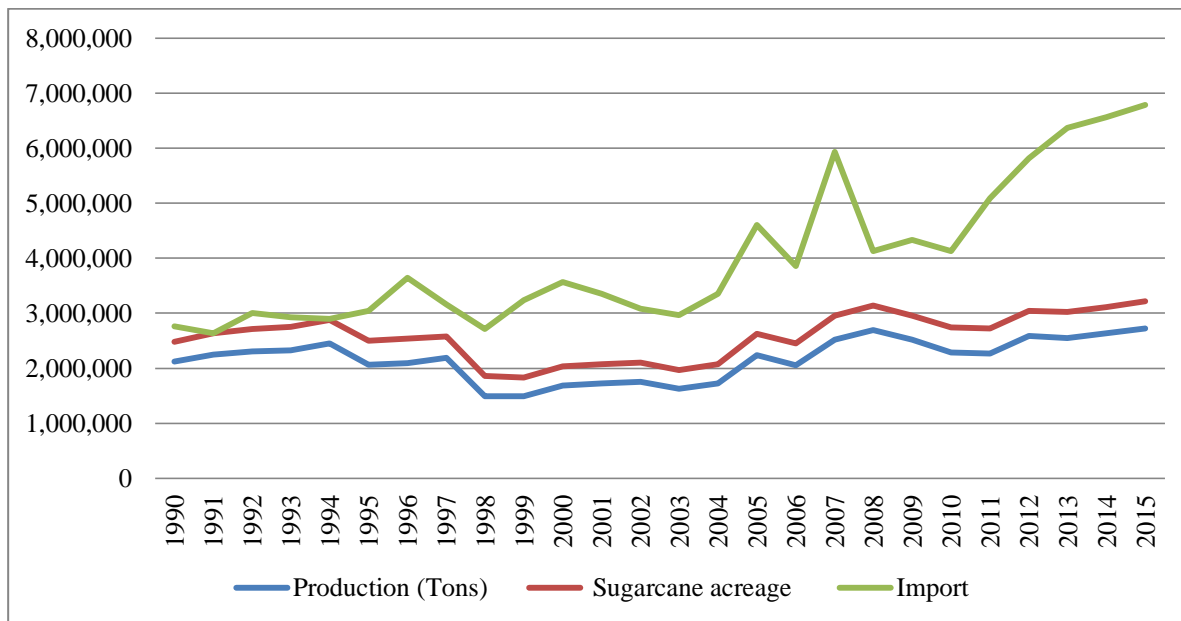

Figure 2: Production, sugar acreage and Import

Development of the sugar cane area and production:
Extensive sugar cane crop acreage data in total includes sugar cane people, belonging to state-owned companies (BUMN) and privately-owned (BUMS) as well as its production can be found in Appendix 1. Using the geometric mean, the growth of plantation area from 1967 until 2015 amounting to 3.27%. In 1967 the vast acreage 103.773 ha and 2015 reaches 487.095 ha. Moderate growth in sugar production in the same period only 2.50% per annum. The productivity of the land is only reaching about 5.631 tonnes per ha with maximum productivity is achieved in 1971 amounted to 8.296 tons/ha and in 1979 minimum of 3.453 tons per ha. In 1967 the productivity reached 8.035 tons per ha and year 2015 only 5.597 tons per ha. Therefore, in the same period the decline of productivity amounting to 0.75% per year.
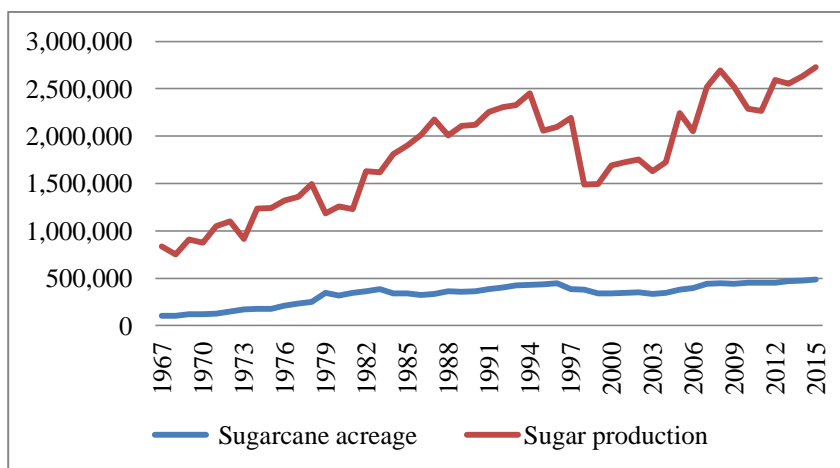

Figure 3: Production of sugar and sugarcane acreage

The graph shows clearly that the vast increase in sugar cane crops changed in line with the increase in production. In a vast acreage of sugar cane plants increases, then the sugar production also increased. But if the vast acreage of crops of sugar cane sugar production is reduced, then undertook to decrease. The relationships referred to in Figure 3 in line with the results of the regression analysis that there was significant influence between the production of sugar cane and vast land area of 50.8%. That to support self-sufficiency in sugar then it should be attempted expansion of sugarcane crop, the sugar cane crop acreage for concentrated in East Java,

Central Java, West Java and Yogyakarta so important to attempted expansion of land on the island of Sumatra and Sulawesi.

Figure 4: Productivity of sugarcane area

In terms of land productivity of sugarcane, Figure 4 shows that the highest productivity achieved in 1971 and then until 2015 production results fluctuate..

Constraints of Self-sufficiency in sugar:
One of the factors that become constraints implementation of self-sufficiency in sugar is age old sugar factory (Indonesia Sugar Annual Report, 2016). The government is targeting self-sufficiency in 2014 with a production of 5.7 million tons, 2.96 million tons for details household needs (GKP) and 2.74 million tons for the industry (GKR). But the achievement was pushed into 2015 - 2019 due to structural problems in the production system, namely: (a) The availability of land is limited; (b) The supply of seed cane excels less; and (c) Management cane farming cannot be resolved in the near future. To achieve sugar production of 5.7 million tons is required additional sugarcane plantations at least 350,000 ha, which is still difficult to achieve.
Ministry of Agriculture calculated that it needs more land and plant revitalization. From other relevant government institutions, namely the Ministry of Forestry promised to give the land of former forest concession (HPH) that have been revoked license management because their activities are not clear and could be converted into sugarcane plantations (RJPM Ministry of Agriculture from 2015-2019). However, land issues are not easy. Problems in land acquisition lies in the difficulty of finding suitable areas for planting sugar cane have requirements. The expansion of sugarcane area outside Java is quite difficult because: (1) The existence of a lawsuit the owners who do not want their land concession made sugarcane crop area; (2) The requirement for permit release of forest land must obtain approval from the local government; and (3) infrastructure for the new area. This problem causes difficulty potential investors to invest. Conversion into non-agriculture continue to occur, and competition with agricultural crops, such as rice, corn, and others, are also very high so the cane land there is also difficult to control so as not reduced. Therefore, the land on the island of Java is considered to be no longer suitable for the development of sugarcane area, but more suitable for property development (RJPM Ministry of Agriculture from 2015 - 2019).
Noting the above description, the self-sufficiency obstacles rooted in three fundamental issues, namely: (a) issues related to on-farm, (b) issues related to off-farm, and (c) non-farm-related issues. In the sector of on-farm, constraints mainly arise from the area of land for the development of the sugar cane crop is limited, especially in Java, superior seed cane is less available, their knowledge of the sugar cane crop is not enough to boost the productivity of land, and the management of sugar cane farming is not as agri-business integrated sustainable. In the field of off-farm or agro-industry sector of sugar and its marketing is inhibited by several factors, notably: sugar factories largely aging and less productive, increased production level of sugar cane farmers do not automatically improve farmers' welfare reasons related to spatial-commerce and farmers are not price maker, as well as low international sugar prices encourage businesses prefer to perform the import of sugar. Non-farm sector, sugarcane farmers see high demand for land for housing needs. Some landowners sell their land to obtain venture capital gives higher returns.

DISCUSSION:

The achievement of self-sufficiency is constrained by several factors. The main factor of off-farm sector which inhibit sugar factories are largely aging > 100 years. On-farm sector major factor holding back is the availability of land to expand the area under sugarcane crop is limited, the results of the high competition among sugar cane farming and the cultivation of other crops such as cacao, soybeans and corn. Many sugarcane farmers to divert land use functions other crops more profitable. In addition, the company is willing to buy housing development located cane land for conversion to a residential complex with an expensive price.

Cooperation through the pattern of the core company of the people (PIR) has not changed the situation. Sugar Factory as the core, while sugar cane farmers (people) as Plasma. In a way, the farmer found a state, that if the rich harvest, Sugar Factory sometimes wants to exploit the situation and buy sugarcane at a relatively cheap price. Such circumstances affect the attitude of farmers to continue to participate in the PIR. At the same time the influence of cash economy is getting stronger tempting farmers. Most farmers do not care for the land properly. Many sugarcane farmers are urban to the city to find another job that can provide direct income. Thus it can be said, the NES system is not optimal.

India and Pakistan try to apply methods of contract farming. Contract farming (CF) generally refers to a situation in which farmers produce or provide agricultural products through collaborating vertically with the company under a contract. A sovereign, when one of the following conditions are met, the business management farmer would lead to the emergence of contract farming, namely: (1) specialty crops that had high grades favorable; (2) the need to supply a consistent and reliable of the purchaser; (3) the market system input and output that cannot be met through purchases on the open market, and (4) the commodity using labor intensive with limited land can produce crops efficiently (Little & Watts, 1994; Singh & Dhillon, 2006). Cooperative farming is a system for the production and supply agricultural products by farmers as primary producers, where farmer's commitment to provide agricultural commodities to the type, quality, and quantity agreed at a certain time, at a certain price to the buyer is already known. In essence, cooperative farming in the sugar industry requires cane farmers and sugar mills collaborate vertically to their advantage in the long term (Singh, 2011).

Cooperative farming is empowerment of farmers through the group, with engineering the social, economic, technological and value-added. Social engineering can be done with the institutional strengthening farmer, education, and human resource development. Economic engineering is done with the development of access to capital for the procurement of farm inputs and access to market technology. Value added engineering done through the development of off-farm enterprises are organized vertically and horizontally (Nuryanti, 2005). Developing countries continue to point towards economic liberalization, people in the village is in need of benefits from trade opportunities and new marketing. Producers who have large tracts of land can obtain capital, market information and institutional support with ease. But on the other hand, farmers with limited land do not have the same ease that they are not competitive (Ian Patrick, 2004).

Contract farming model can provide improvement in the welfare of small farmers. Contract farming is a system of production and marketing of medium scale where there is a risk of burden sharing between the production and marketing of agribusiness and small farmers. This system can be seen as a breakthrough to reduce high transaction costs has consequence market failure and / or failure of governments to provide the means (input) required (eg, credit, insurance, information, infrastructure and production factors other) and marketing institutions. Small farmers through contract farming can switch from traditional farming systems to farms that generate high added value. Land of farmers positioned more than just plasma at PIR system. Small farmers (smallholders) that have been neglected era of economic progress need to be raised dignity through contract farming. The government, through the State Owned Enterprises (SOE's), especially those engaged in the industrial sector of sugar, was given the mandate to provide a mutually beneficial contract that contract farming is not just raise the welfare of small-scale sugarcane farmers, but also has implications for the realization of self-sufficiency. National sugar production can be increased and the import of sugar can be dispensed with, even Indonesia could be sugar exporter countries such as in colonial times.

CONCLUSION:

The analysis showed that in order to improve the national sugar production could be achieved through: (a) the sugar factory revitalization, (b) expansion of sugarcane plants, (c) reduces imports, (d) improved governance cane farming, and (e) the improvement of sugar trade. The end goal that will be realized is to reach self sufficiency, followed by the welfare of sugarcane farmers, especially small farmers. These noble objectives

should be pursued through government regulations, including the strengthening of the role and function of the SOE's sector sugar industries as partners in running the self-sufficiency of farmers nationwide.

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APPENDIX 1

Years	Sa	Si	Sp	consumption
1967	103.773	-	833.900	-
1968	106.463	-	752.100	-
1969	123.036	-	907.600	-
1970	121.715	-	872.446	-
1971	126.384	-	1.048.525	-
1972	148.710	6.123	1.100.577	-
1973	169.509	49.140	914.869	-
1974	176.775	112.919	1.234.726	-
1975	179.828	96.809	1.241.656	-

Years	Sa	Si	Sp	consumption
1976	208.902	207.828	1.318.374	-
1977	234.492	226.828	1.360.373	-
1978	248.101	112.919	1.496.968	-
1979	343.496	295.081	1.186.390	-
1980	316.063	400.920	1.259.950	-
1981	346.186	720.950	1.230.120	-
1982	363.320	687.151	1.626.802	-
1983	384.373	168.045	1.619.538	-
1984	342.008	2.848	1.810.373	-
1985	340.229	4.354	1.898.809	-
1986	325.703	79.879	2.014.574	-
1987	334.918	129.756	2.175.874	-
1988	365.529	130.260	2.004.051	-
1989	357.752	325.479	2.108.348	-
1990	363.968	280.978	2.119.585	2.382.863
1991	386.304	73.986	2.252.667	2.519.732
1992	404.062	296.226	2.306.484	2.435.166
1993	425.653	167.988	2.329.811	2.691.856
1994	428.736	15.207	2.453.881	2.929.123
1995	436.037	544.300	2.059.576	3.170.936
1996	446.533	1.099.306	2.094.195	3.067.483
1997	386.878	578.025	2.191.986	3.366.944
1998	377.089	844.852	1.488.269	2.964.133
1999	342.211	1.398.950	1.493.933	3.007.947
2000	340.680	1.538.519	1.690.004	3.060.604
2001	344.441	1.284.469	1.725.467	3.250.000
2002	350.722	970.926	1.755.354	3.300.000
2003	335.725	997.204	1.631.918	3.350.000
2004	344.441	1.284.469	1.725.467	3.400.000
2005	381.786	1.980.487	2.241.742	3.420.000
2006	396.441	1.405.942	2.051.644	3.460.000
2007	441.440	2.972.788	2.517.374	3.750.067
2008	448.745	983.944	2.694.227	3.508.000
2009	441.440	1.373.564	2.517.374	4.850.109
2010	454.111	1.382.525	2.290.116	4.289.000
2011	451.788	2.371.249	2.267.887	4.670.770
2012	451.255	2.769.239	2.591.687	5.200.000
2013	469.227	3.344.304	2.551.026	5.516.470
2014	477.881	2.769.239**	2.632.242	5.200.000**
2015	487.095	3.344.304**	2.726.393	5.516.470**

* Sugarcane acreage (Hectares) = Sa
* Sugar import (Tons) = Si
* Sugar production (Tons) = Sp
** Estimation