

Cover Page

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EFFECT OF IMPORT TARIFF IMPLEMENTATION POLICY ON REFINED SUGAR PRODUCT COMPETITIVENESS IN INDONESIA.

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ABSTRACT

This research is intent to determining: (a) the effect of welfare distribution with applied import tariff of the government revenue, consumer expenditures, producer revenues, and efficiency losses (in production, in consumption and net effect), and (b) the level of competitiveness of cane sugar in Indonesia by calculating the Domestic Resource Cost (DRC).

The research using libraries research method, that is collecting data from the related preceding researches and other references such as magazines, journals, bulletins and the like.

The research result showed that : (a) the government revenue, change of consumer surplus, producer surplus, economic net loss in production and consumption and exchange gain economization, are influenced by the import tariff and elasticity price toward supply and demand, so that the welfare distribution value will be bigger; (b) sugar product competitiveness in Indonesia by knowing cane field calculation in East Java both wet and dry field is higher than the same product from other countries as it is shown by the value of $DRC < 1$.

Key word: Sugar, Welfare Distribution, Domestic Resource Cost (DRC), and Import tariff

Introduction

A number efforts had been carried out to increase refined-sugar production started from approximately 1, 72 million tons in 1990 and lasted in 2,44 million tons in 2008. Within This 18 year period, it was calculated increasing up to 37 percent. In 2008, its per capita production reached 12,44 kilograms and its consumption gained higher 18,17 kilograms per capita. As a result, refined sugar import in 2008 reached 1,15 million tons and its exchange gained US\$ 195,2 millions. It was, then estimated that refined sugar import reach 1.443.000 tons; one kilogram of sugar import tariff was assumed to be US \$ 0,426 millions at average in 2008 FOB, therefore the need of refined sugar import in 2008 reached approximately US \$ 614 millions. It was a large amount of funds converted in to IDR (Indonesian currency) which is then equal to more then IDR 6,14 quintillions (\$ 1 = IDR 10,000).

The Indonesian government through the Ministry Letter of Commerce and Industry, number: 364/MPP/Kep/8/1999, has carried out import commerce policy, and the Letter of import duty of rice and sugar (respectively 25% and 30%), as well as the change of import commerce are defined through the letter of the Indonesia Finance Ministry number 588/KMK.01/1999 dated 31 December 1999 valid since 1 January 2000. This policy states that public Importers are allowed to import sugar. The main goal of import duty implementation is to reduce sugar import volume in order to protect domestic producers against to cheaper foreign sugar products. The admission charge of import applied is *ad valorem* meaning that the percentage of the import duty is fixed to all imported commodities.

The policy of sugar commerce, rise of competitiveness and efficiency of sugar production are noticeably prioritized to reduce import quota and economize its exchange. The implementation of its commerce is required to support Indonesian government's plans; to protect all of economy agents. It is expected to result

positively in every unit of economy agents' welfare, particularly of producers and consumers' welfares as well as the sugar product competitiveness in international commerce.

With reference to the background mentioned, it is formulated that the problems to discuss are follows: (a) how sugar commerce policy influence on the units of economy agents' welfares such as producers, consumers and government; and (b) how competitive the national sugar commodity is compared to international commerce in order to reduce import quota.

The goal of this research is to investigate the following issues : (a) the effect of welfare distribution referring to the import duty on government revenue, changes of consumer and producer surplus, and efficiency losses (in terms of production, consumption, and net effect) and (b) sugar product competitiveness in Indonesia by calculating the Domestic Resource Cost (DRC).

The results of this research are intensely expected to be significant for the Indonesian government to decide sugar production, valuable input for both government and sugar cane farmers about whatever factors influence on demand and supply, welfare distribution, and sugar product competitiveness in Indonesia.

The price change of sugar which occurred as government defined the policy is identified by evaluating the change and surplus of producers and consumers. If a balance cost of sugar defined is higher than global market's cost, producers are secured since sugar domestic market price is higher than import price. As a result, producers' surplus increases or producers' welfare rises up. On the other hand, domestic consumers pay higher for sugar import price which means consumer surplus decreases.

The impact of applying sugar import price and its protection is drawn in following diagram :

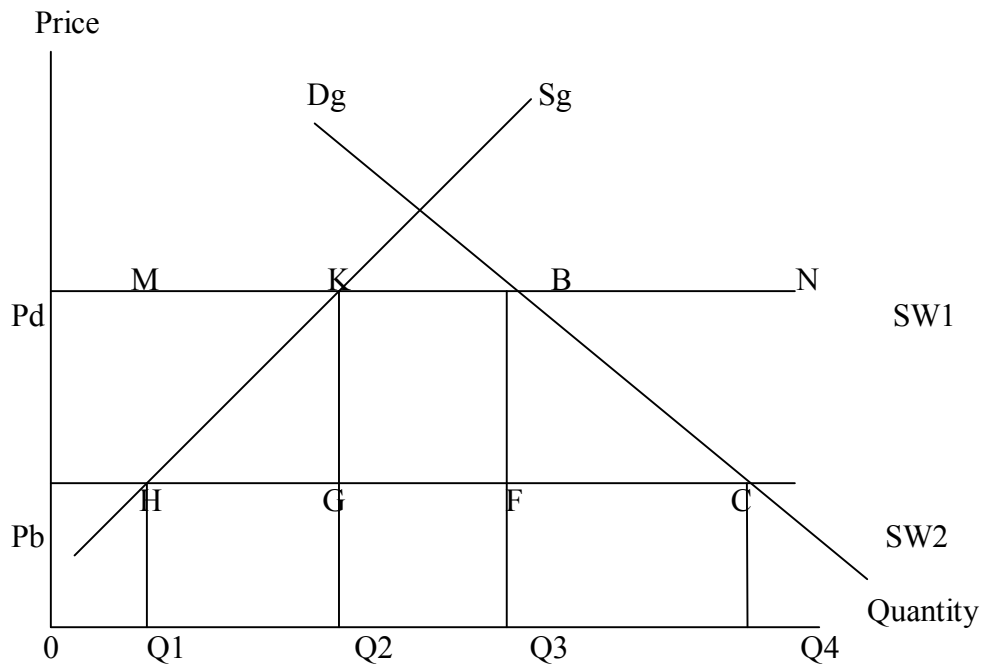


Diagram 1. The Welfare Distribution Of Economic agents

Importing countries import only a small number of sugar product commercialized in the global market. If import tariff or protection price is not enacted, domestic price will be equal to global market price called Pb, With Pb price, domestic consumer

spend amount of Q1. Policy protection price is drawn higher than its import price which constitutes a world price. Curves of domestic demand and domestic supply are called Sg. The supply curve of import is SW in the horizontal line because sugar consumption is OQ4 and producers only produce a number of OQ1. The lack of OQ4-OQ1 must be imported. If there is any import tariff or protection price stated for domestic policy amount to Pd which is higher than the world price called Pb, the curve of import supply will shift in parallel upward to Sw1. At the higher price of Pd, consumers tend to reduce their sugar consumption up to OQ3; however, domestic producer tend to increase sugar production at OQ2. As a consequence, the quota of sugar product required to be imported declines up to OQ3-OQ2 since the consumption turn down and the production is up.

With the statement of import tariff and protection price as much as Pd, the impact of this policy can be evaluated. The government revenue, as if the only importer, is equal to GKBF square. Efficiency rate of consumers and producer is shown in FBC and HKG triangles, whereas, FBC is *net economic loss* (NELc) of the consumers, which is also known as *loss in efficiency* because they consume sugar lower and in turn it influence the benefit and satisfaction gained. Moreover, a consumer are obliged to pay at higher price meaning that their welfare reduce consequently. HKG triangle which is *a net economic loss* occurred in production sector (NELp) is as the inefficiency of production because *resource* reallocation is forced to produce protected commodity taken from other commodities which have higher productivity; or producer spend higher cost of production when supply curve is upward (movement takes place along supply curve). Welfare is evaluated as follows : domestic consumers required to pay at higher price out of what is supposed will lose consumer surplus as much as PbPdBC area. On the other hand, the protected farmers or producer gain beneficial in a line with the higher producer surplus as much as PbPdKH area, which is actually derived from the loss of consumer surplus. It is then distributed in the following situations : PbPdKH area is achieved by producers; government revenue is derived from GKBF area as the only importer; FBC and HKG areas are *the economic efficiency losses* of consumers (Kiptiyah 2007).

Domestic Resource Cost (DRC) is the comparison between opportunity cost of domestic product toward its add value. It is calculated by summing up the total cost of area, workers, and capital. It is then applied directly or indirectly to the input. The component of DRC depend upon the calculation method of add value (Corden or Balassa method). Corden method concern with add value calculation in both direct and indirect calculation. If domestic resource is calculated through the input derived from the untraded, it is called indirect. Balassa method only deals with the total cost of primary resource straightforwardly employed. Corden method calculates add value higher than the Balassa does (Tsakok, 1990).

Domestic Resource Cost is assumed as a value range. It shows efficiency rate of domestic production or product competitiveness internationally. The exchange rate is highly based on its opportunity cost. $DRC < 1$ indicates that the government economizes the exchange rate and maintain local production considering the opportunity cost of domestic resource is lower than exchange paid for commodity import. $DRC < 1$ also illustrates efficiency and product competitiveness worldwide. On the other hand, if $DRC > 1$ takes place, the opportunity cost of domestic resource is higher if the government maintains local production. However, if $DRC = 1$, it indicates

that the economy condition is in good balance between devise gained or economized by maintaining local production (Tsakok, 1990).

Research Method

This Research is started with data collection. The researcher employ library research, a method of collecting data from the related preceding researches and other references such as magazines, journals, bulletins and the like. Data are also collected from the statistic bureau, Indonesian Sugar Statistic and Development Center (P3GI), Logistics Affair Agency (BULOG) and other institutions related to this research major.

To calculate the welfare distribution as the impact of commerce policy through import duty (started from 25% to 120%) on the government revenue, consumer and producer surplus, efficiency losses (production, consumption, and net effect), it is calculated by using the following formula proposed by Isabella Tsakok (1990) :

1. Nominal Protection Coefficient (NPC) is the level of domestic price protection toward foreign commodities:

$$\text{Gross NPC} = \frac{P_d}{P_b}$$

2. Change of government revenue (PGR):

$$\text{PGR(E)} = \frac{(\text{NPC}-1)(W'-V')}{(\text{NPC})}$$

3. Saving of exchange gain for import deficiency (PFE):

$$\text{PFE} = \frac{(\text{NPC} - 1) (\text{ies } V' - \text{ep } W')}{(\text{NPC})^2}$$

4. Net economic loss in consumption (NELc):

$$\text{NELc} = 0,5 \text{ep} \left\{ \frac{(\text{NPC}-1)^2}{(\text{NPC})^2} \right\} \times W'$$

5. Net Economic Loss in Production (NELp) :

$$\text{NELp} = 0,5 \text{es} \left\{ \frac{(\text{NPC}-1)^2}{(\text{NPC})^2} \right\} \times V'$$

6. Change of consumer surplus (PWGc):

$$\text{PWGc} = - \left\{ \frac{(\text{NPC}-1)}{(\text{NPC})} \times W' \right\} + \text{NELc}$$

7. Change of producer surplus (PWGp)

$$\text{PWGp} = \left\{ \frac{(\text{NPC}-1)}{(\text{NPC})} \times V' \right\} - \text{NELp}$$

8. Net effect of Price Protection Policy :

$$\begin{aligned} \text{Effect Netto (Net effect)} &= \text{WGp} + \text{WGc} + \text{PGR} \\ &= -(\text{NELp} + \text{NELc}) \end{aligned}$$

Means of Variable Notation :

V' = Domestic product on the domestic price or support price.

W' = Domestic consumption on the domestic price or support price.

es = Price elasticity of domestic supply.

ep = Price elasticity of domestic demand.

Pd = Domestic price of commodity.

Pb = World border price.

Qc = Total domestic consumption.

Qp = Total domestic production.

To evaluate the national sugar product competitiveness by applying the following Domestic Resource Cost (DRC) proposed by Tsakok (1990) :

$$DRC = \frac{\sum_{j=1}^n a_{ij} V_j}{P^f_i - \sum_{j=1}^k a_{ij} P^f_j}$$

Where :

$a_{ij}, j=1$ ke n = coefficient of domestic resource and non-tradable input.

$a_{ij}, j=1$ ke k = coefficient of tradable input.

V_j = The shadow price of domestic resource.

P^f_i = output on border price (FOB price).

P^f_j = input on border price (CIF price)

Discussion and Result

Refined sugar is one of primary need of Indonesian people. The need of refined sugar keeps rising continually along with the Indonesian population and income growth. For detailed information, the data of sugar industry in Indonesia are presented in the following table :

Table 1. The Production, Demand, Import and Area of Sugar, Labour Wage and The Rate of Sugar Cane productivity in Indonesia 1990 to 2008

Year	Production (ton)	Import (ton)	Land Harvest of Cane (Ha)	Wage Labour (Rp/day)	Cane Production (Ton/ha)
1990	1.725.179	0	277.615	2.175	75,70
1991	2.025.171	0	317.090	2.244	79,20
1992	2.117.710	179.000	334.000	2.428	77,20
1993	2.289.645	92.000	323.302	2.550	76,60
1994	2.435.881	150.207	428.736	2.750	78,90
1995	2.059.576	687.936	436.037	3.250	76,90
1996	2.094.195	975.830	446.533	3.887	72,93
1997	2.191.986	1.364.000	386.878	4.475	79,19
1998	1.488.269	1.730.473	377.089	5.040	78,60
1999	1.439.933	1.500.000	342.211	6.750	71,26
2000	1.690.004	1.500.000	340.660	7.800	71,47
2001	1.725.467	1.500.000	344.441	10.500	71,00
2002	1.755.354	1.500.000	350.722	10.450	72,30
2003	1.634.560	1.500.000	336.257	10.250	72,70
2004	2.051.000	1.348.349	344.000	10.765	72,50
2005	2.265.000	1.245.000	365.450	12.750	72,85
2006	2.375.000	1.150.000	380.000	13.500	73,00
2007	2.412.000	1.147.212	388.677	13.768	73,12
2008	2.443.000	1.443.000	396.000	13.876	74,58

Source : Indonesian Statistic Bureau (BPS), World Sugar Cane Statistic 2008/2009, P3GI Pasuruan and Logistics Affair Agency (BULOG)

Data in Table 1 show that within 18 years, the total of sugar production had increased but it was lower than increase of entire national sugar demand. The increasing number of the national sugar production did not meet the sugar demand in Indonesia since sugar supply and import were not considered adequately. However, this condition was not followed with the increasing productivity of sugar. The increase of sugar production was typically caused by the increasing area of sugar cane. Its productivity had remained falling within 18 years. In 1990, sugar productivity reached 75,70 tons per hectare at average, and it had declined up to 74,58 tons per hectare by 2008.

Observing the sugar development data, it is summarized that today cane farmers tend to be saturated; even the response to sugar production remains falling trend. It is indicated by the cane productivity produced by farmers repetitively decline.

In the present time, Sugar production in Indonesia is incredibly centralized in Java. This Island is inhabited by almost 67 percent of the total of Indonesian population and which possesses the largest consumer contributes almost 75 percent of the entire domestic sugar production. In the annual planting period (MTT) 2006/2007 the total of sugar cane production in Java recorded 27,9 million tons (74,9%) and outside Java recorded 9,6 million tons (25,1%). While in the 2007/2008 annual planting period, the total of sugar cane production decline up to 23,8 million tons (72,5%) and the outside Java fell in to 8,5 million tons (27,5%) (P3GI, 2008).

On the other side, with reference to the research conducted by the Indonesian Sugar Statistic and Development Center (P3GI), in 2006 sugar cane planting area, either dry or wet, in Indonesia shows that sugar cane planting still centralized in java. either dry or wet, in Indonesia shows that sugar cane planting is still centralized in java. It is approximately 285.026 ha or about 68,15 percent of the entire sugar cane planting area. Since 1999, the area of sugar cane filed has decline. In that year, 152.305 ha of sugar cane area had decrease into 118.188 ha or 22,44 percent by 2005/2006 annual planting period. On the contrary, dry field increase from 84.387 ha to 126.303 ha equal to 49,67 percent (Java) and 1.407 ha to 10.607 ha equal to 653, 87 percent (outside java) (P3GI 2008). Furthermore, P3GI release that the problem is the sugar cane plants in dry filed has 31,60% productivity lower than in wet fields. As a consequences, sugar cane crystal level (rendement) in dry fields is factually lower than in wet fields. Ratnawati (2006) stated that the rendement in dry and wet field are respectively 7,59% and 8,12%. Moreover, sugar cane in dry fields requires high farming cost with different technology and production cost per kilogram turns into more expensive since the sugar factory location in relatively distant. Nevertheless, in dry fields sugar cane provide much benefit and tends to be effortless.

The calculation result of applying import tariff toward the welfare of producer, consumer and government are presented in Table 2. By using the data in Table.1, the impact of import tariff implementation is simulated in 25%, 30%, 40%, 60%, 100% and 120% toward the welfares of producers, consumer, and government.

Table 2. The Calculation of Welfare Distribution With Import Tariff as 25%, 30%, 40%, 60%, 100% and 120% in billions rupiah (using ϵ_s 0,025 and ϵ_p -0,119)

Item	Tariff 25%	Tariff 30%	Tariff 40%	Tariff 60%	Tariff 100%	Tariff 120%
1. NELp	3,8193	5,0849	7,7945	13,427	23,871	28,408
2. NELc	37,1838	53,5446	95,1904	214,178	594,940	856,714
3. WGp	1905,842	2286,508	3047,663	4569,753	7614,773	9137,964
4. WGc	2536,932	3053,243	4094,788	6213,574	10593,933	12855,505
5. GR	590,087	708,105	944,140	1416,210	2360,349	2832,419
6. FE	1220,725	1226,894	1239,233	1263,909	1313,261	1337,937
8. Net Effect	41,008	58,629	102,984	227,605	618,811	885,122

Table 2 shows that the impact of applying import tariff 25%, 30%, 40%, 60%, 100% and 120% on the distribution of consumer's welfare, producer, and government. If the government's intervention in term of import tariff implementation is denoted with 25 percent, it result in reducing consumer's welfare measure with the decrease of consumer surplus estimated about 2536,932 billions. The loss consumer surplus is then distributed to the additional producer's surplus about IDR 1905, 842 billion (74,52%), runs the economy inefficiency from producer sector about IDR 37, 183 billion (1,46%), and contributes to the government revenue about IDR.590, 087 billions (23,26%). The import tariff policy is supposed to economized the exchange gain about IDR 1220,725 billions. This calculation is made with reference to the Nominal Protection Coefficient (NPC) estimation about 1,55, and price elasticity to the national supply and demand is respectively 0,025 and -0,119, with sugar import in 2008, it is estimated to 1.443.000 tons and the exchange rate is IDR 10.000/1 US \$.

The welfare distribution is illustrated in diagram 2 below :

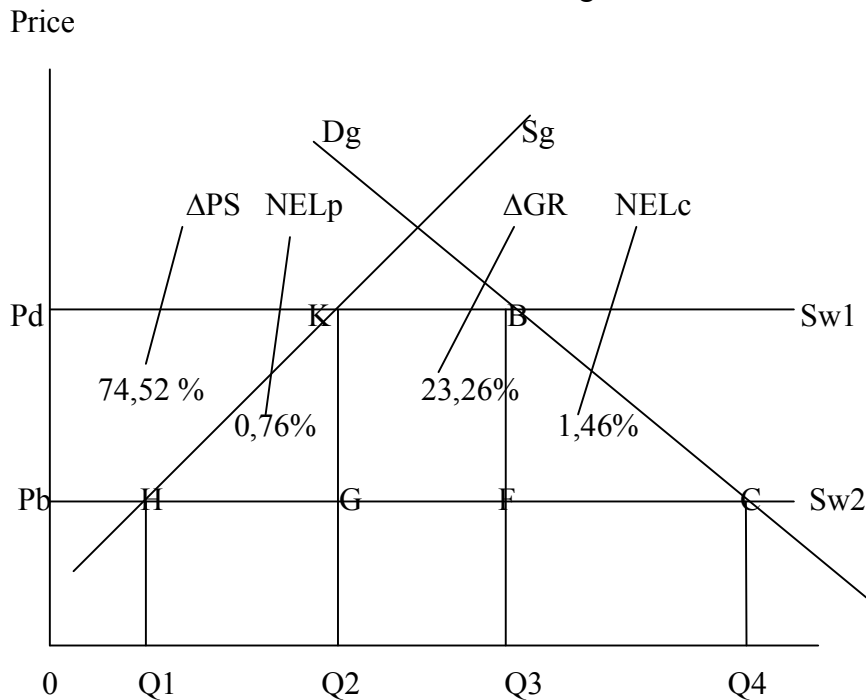


Diagram 2. The Percentage of Welfare Distribution of Economic Agents.

Table 2 shows that the higher import tariff, the higher efficiency losses. This is obviously indicated by net effect value which gradually rises from IDR 41,008

billions with 25% import tariff to IDR 885,122 billions with 120% (more than 2000 percents of increase).

The government effort to reduce this net effect of efficiency losses on producer sector is diverting some of government revenue (import tax) to increase production efficiency, particularly to the cost of technology development. It can be applied to farmer level, in which most workers are involved. The forms of the technology development are such as introducing a best seed, better technique of planting, production facilities (fertilizer, tools, and chemical products) adjusted with local condition.

The implementation of import tariff in consumer level particularly for underprivileged farmers can be solved by giving them subsidies. In this case, the government needs to apply two prices system (protection price for producer and subsidize price for poor consumers).

Import duty policy aimed at protecting domestic sugar producer in a short term period is reasonable. However, in a long-term period this policy will be inapplicable. Beside it inflicts not only in consumers financial loss (they must pay at higher price), but also in the domestic sugar industry which in turn remains inefficient for being repeatedly protected. Moreover, in free trading era this situation is inapplicable for long-term period. Import duty needs declining gradually. As a result, it enables domestic sugar producers to renew their production system with the intention that it turns out to be efficient and competitive compared with foreign sugar industry.

If the goal of import tariff implementation is to stabilize domestic price, it is not effective because foreign price change will directly be transmitted to domestic price. If scarcity of domestic sugar commodity happens, it will result in high price difference between domestic and foreign price, and if import tariff is higher it causes the smugglings.

This import tariff influencing sugar commodity price in Indonesia should be controlled by the government. Calculation on how high import tariff is applied should meet the elasticity price toward supply and demand.

Table 3 is as a comparison. The following evaluation presents welfare distribution with assumption that price elasticity toward supply is about 0,41 and toward demand is about -0,45.

Table 3. Calculating of Welfare Distribution With Import Tariff as 125%, 30%, 40%, 60%, 100% and 120% in billions rupiah (using es 0,41 dan ep -0,45)

Item	Tariff 25%	Tariff 30%	Tariff 40%	Tariff 60%	Tariff 100%	Tariff 120%
1. NELp	62,6368	83,3923	127,8304	220,207	391,480	465,894
2. NELc	140,6110	202,4800	359,9640	809,918	2249,773	3239,674
3. WGp	1847,024	2208,201	2927,627	4362,979	7247,163	8700,478
4. WGc	2640,359	-3202,178	4359,561	6809,314	12248,767	15238,465
5. GR	590,087	708,105	9445140	1416,210	2360,349	2832,419
6. FE	1695,742	1796,914	1999,258	2403,947	3213,326	3618,015
7. FE(US\$)	226,099\$	239,589\$	266,568\$	320,526\$	428,443	482,402
8. Net Effect	203,247	285,872	487,794	1030,126	2641,254	3705,568

Calculating on DRC value is done through calculating input and output value rates of cane sugar production in East java particularly in dry and wet fields in annual planting period 1990/2008. This Cane sugar production in East Java becomes the

basis of production cost considering that these fields are the biggest ones in Indonesia. As a result, calculating on DRC value for sugar cane planted in dry and wet fields adequately represent the national calculation.

Calculating on DRC value in this research, including national resource cost such as worker cost, rice field, seed cost, urea fertilizer, TSP, ZA, Cane production milled into sugar product is added with marketing cost. While the exchange gain economization can be shown by the rest between the output and input values imported. The imported input is the input calculated as a foreign price component including KCL fertilizer, chemical product, and 50% of maintenance cost.

The calculation result on DRC value shows that DRC value of sugar cane planting in wet and dry fields is less than 1 (DRC=0,860 in wet field, and DRC=0,700 in dry field) denoted that sugar product competitiveness in Indonesia is higher than related product from other countries. Therefore, the third hypothesis that sugar product competitiveness in Indonesia is lower than the same product from other countries cannot be accepted. This calculation result is the same as what had been conducted by Ratnawati (2006), who found that coefficient value of domestic resource cost (DRC), planted either in dry field or in wet field, is less than 1 (DRC<1). This case indicates that Cane sugar producer planting cane either in wet field or in dry field is economically efficient in using domestic resources. In other words, sugar cane producers get the advantage to produce sugar product in order to fulfill the import substitution. For Indonesia, It had better produce local sugar commodity in the season of devise saving than import sugar. But in a fact, the demand has not been fulfilled, hence, to support local sugar in Indonesia the government needs to import sugar.

Based on DRC value above, it cannot directly be interpreted. It must be noticed that there are lots of sugar factories in Indonesia (especially in East Java) have been aged and no longer efficient. The inefficient old small factories should be closed because they cause national sugar production not competitive (these factories need gradually to be subsidized by other sugar factories).

Besides that, it is necessary to consider how to relocate sugar factories outside Java for cane area since they are continually limited, and sugar product is to compete with other commodity (especially rice). In Java, cane planted in wet field cannot compete with other plants. This case occurs because the income from cane plants is relatively lower, and cane plants need higher cost and longer time. From counting on DRC value above, it appears that the efficiency and sugar production competitiveness in dry field is higher than in wet fields.

Conclusion

The result of evaluation on import tariff implementation to sugar product in Indonesia above contribute the following conclusion and suggestion:

1. From the calculation result on the effect of import tariff to welfare distribution, it is clear that the government revenue, change of consumer surplus, producer surplus, economic net loss in production and consumption and exchange gain economization, are influenced by the import tariff and elasticity price toward supply and demand, so that the welfare distribution value will be bigger.
2. Sugar product competitiveness in Indonesia by knowing cane field calculation in East Java both wet and dry field is higher than the same product from other countries as it is shown by the value of DRC<1.

3. The evaluation results above show that Indonesia has not been able to fulfill sugar demand from local production. To increase the sugar production, it is necessary to increase the purchase of government sugar (*provenue* cost) and to enhance planting areas and productivity through technology reparation in it he farming level.
4. It is suggested for the further research with wider scope of discussion to include accounting of sugar product competitiveness in East Java.

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