Optimization of sustainable sugar industry towards food security

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Abstract. World Trade Forum (WTO) that sugar commodity is one of the agricultural commodities. The operation of the sugar business unit must be continued to support the government program in the Sugar Self Sufficiency effort given the rapid development of sugar needs while increasing production is relatively unbalanced. Sugar self-sufficiency and increasing the income of sugar cane farmers is one of the objectives of the government of the United Indonesia Cabinet II. The type of research in this paper is normative juridical research. The nature of this research is analytical descriptive. The formulation of the problem in this study is how to optimize the sugar industry as food security and how alternative policies for achieving sugar self-sufficiency. Food security according to Law Number 18 of 2012 concerning Food is defined as a condition for the fulfillment of food for the state to individuals, which is reflected in the availability of adequate, evenly affordable food and does not conflict with religion, both in quantity and in safe quality, diverse, nutritious, trustworthy and community culture to be able to live healthy, active and productive in a sustainable manner.

1. Introduction

Food security, industrial materials, as well as new and renewable energy are some important components supporting the survival of a nation. A large nation is a nation that can meet the food security of its citizens, is able to process its resources into high-value industrial material, and is able to find and utilize new and renewable energy. World Trade Forum (WTO) that sugar commodity is one of the agricultural commodities. To strengthen food security and quality of life in rural areas for consideration, Indonesia has set a target of self-sufficiency in sugar, which is currently not being achieved, and is trying to increase domestic production [1]. Currently PT. Perkebunan Nusantara II (PTPN 2) has 2 (two) units of sugar mills in North Sumatra which operate namely Sei Semayang Sugar Factory and Kwala Madu Sugar Factory in reasonably good condition with a planting area of 8,500 Ha in Deli Serdang and Langkat District, North Sumatra.

One of the goals of the Government of United Indonesia Cabinet II is to increase sugar self-sufficiency and income of sugarcane farmers. Several agencies and ministries are involved in making this happen, both self-sufficiency in white sugar and refined sugar. Various policies were designed to influence the decisions of sugarcane farmers, sugar cane processing industry, refined sugar industry, food and beverage industry, pharmaceutical industry, consumers and trade players to achieve these national goals. The potential for conflict to achieve the goal will be high if the policies of each agency and ministry are not well coordinated. To achieve these goals: (a) analyse the conflict between the goal of self-sufficiency in white sugar and other objectives, (b) develop refined sugar agro-industry...
and sector development agriculture, in order to achieve the sugar industry completely independent of imported raw materials and (c) to analyse the structure of the domestic sugar market [2].

The operation of the sugar business unit must continue to support the government's program in the Sugar Self-Sufficiency effort given the rapid development of sugar needs while increasing production is relatively unbalanced (national sugar demand is 5.5 million tons while national production is only 2.5 million tons) [3]. The formulation of the problem in this research is how to optimize the sugar industry as food security and how alternative policies for achieving sugar self-sufficiency.

2. Methods
The type of research in this paper is normative juridical research [4]. The nature of this research is descriptive analytical research that is focused on examining the application of positive legal norms or norms and this study Law Number 18 of 2012 concerning Food and Laws Number 41 of 2009 concerning Protection of Sustainable Agricultural Food Land for Farming Enterprises.

3. Results and discussion

3.1. Optimization of the sugar industry as food security
PT. Perkebunan Nusantara II (PTPN 2) in carrying out business activities must synergize with the applicable mechanism for each state enterprise. As a public dimension company, a state plantation is one of the companies managed directly by the state. As the state constitution implies that the state has the right to control Indonesia's natural wealth to be used for the greatest prosperity of the people. For this reason, management is at the country's name. PT.Perkebunan Nusantara II (PTPN 2) has 2 (two) units of sugar mills in North Sumatra which operate namely Sei Semayang Sugar Factory and Kwala Madu Sugar Factory in reasonably good equipment condition. Indonesia has a sugar factory which is managed by PTPN 2, namely Kwala Honey Sugar Factory and Sei Semayang Sugar Factory which produces sugar cane or sugar from sugar cane. PT. Perkebunan Nusantara II (PTPN 2) has its own plantations, and then the sugar cane is processed and produced at the factory and produces sugar.

According to the Indonesian Sugar Council self-sufficiency for a country's product will be achieved if the net amount of domestic products reaches at least 90% of the total domestic consumption, like to meet household consumption, industry and national trade. Thus the interpretation of sugar self-sufficiency is the production of sugar-based domestic sugar cane which has reached 90% of national needs [5]. Based on the opinion of the Indonesian Sugar Council to achieve the goal of sugar self-sufficiency, it is divided into 3 (three) stages, namely (a) to meet the urgent needs of self-sufficient households in consumptive sugar, (b) to meet the needs of households, industry and at the same time to achieve self-sufficiency in the national sugar trade balance, consumption of sugar directly, (c) competitive self-sufficiency [6]. Food is a basic requirement for mankind that must be fulfilled at all times. The right to obtain food is one of the human rights as stated in article 27 of the 1945 Constitution [7].

Food security according to Law Number 18 of 2012 concerning Food is defined as a condition for the fulfilment of food for the state to individuals, which is reflected in the availability of sufficient food, both in quantity and quality that is safe, diverse, nutritious, trustworthy, and the culture of the community to be able to live healthy, evenly affordable and not against religion, active and productive in a sustainable manner. The policies needed to achieve these goals are both external and global, based on the internal conditions of the sugarcane farmers and traders [8].

Optimizing the function of farmer groups and cooperatives also needs to be done to balance the policies of the government. The government can at the same time utilize data availability and conduct validity tests, so that it can be utilized maximally to carry out food distribution throughout Indonesia. Another important solution to be carried out is the supervision of food prices starting from the level of producers (farmers) to the hands of consumers so that food production continues to run optimally.
3.2. Alternative policies for achieving sugar self-sufficiency

PTPN 2 plays a strategic role in advancing the national sugar industry. The sugar production process at PTPN 2 includes the provision of sugarcane seeds, then the process of planting sugar cane, the process of cutting sugarcane by farmers, the sugar cane milling process carried out by the sugar factory, innovating in improving sugar factory equipment to the sugar wrapping process to improve the production management system. The results showed that internal factors (strengths) that influenced the development of PTPN 2 sugar marketing were human resources (HR), sufficient capital, company experience in terms of sugarcane cultivation, land potential and the presence of sugar production technology. Whereas other internal factors (weaknesses) are low productivity and yield, inadequate management, inefficiencies at the farm level, inefficiencies at the factory level and low product quality.

Based on the SWOT analysis, a strategic direction for PTPN 2 sugar marketing development can be generated. The elements of strength and opportunity in developing PTPN II sugar marketing development need to get priority. The handling of these variables is expected to reduce the existing weaknesses and threats. Strategies that need to be applied in an effort to improve PTPN 2 sugar marketing are: (a) Expanding the marketing network, (b) Increasing productivity and yield by applying technology, (c) Develop and analyse a marketing system in order to create a wider market, (d) Application of cultivation techniques and management of sugarcane in accordance with Standard Operating Procedures (SOP), (e) Improving the quality of human resources, (f) Improving cultivation technology and sugar technology, (g) Improving the quality of product quality.

Carrying out the optimization of the sugar business unit at PTPN 2 through cooperation in planting sugar cane (on Farm) with partners who have experience in sugarcane cultivation and have sufficient financial strength. All costs of On farm (from sugarcane planting, maintenance, cutting and transport) are the responsibility of partners and partnership mechanisms are as follows: (a) For planting sugarcane land (on farm) there is a rental fee from partners to PTPN 2; (b) As for sugar processing in the Sugar Factory (on farm) the production sharing cooperation with the composition is for GKP is 65% (Partners) and 35% (PTPN 2), for Drops (Molasses) are 50% (Partners) and 50% (PTPN 2).

PTPN 2 is optimization of sugar operations management unit for on-farm operations. In addition to benefiting from profit income from operational cooperation on farm, benefits the others are as follows: (a) PTPN 2 is not burdened with substantial cash flow because the operations of sugarcane cultivation, sugar cane and sugar mill processing require large cash flows because they are concurrent; (b) Optimizing asset management and preventing loss of assets (state losses). If not utilized it will be taken over permanently by the community/third parties for personal/group interests; (c) The operation of the Sei Semayang Sugar Factory (PGSS) and the Kwala Madu Sugar Factory (PGKM) can reduce the company's burden, in addition it can accommodate PTPN 2 employees and contribute positively to the surrounding community.

To increase the revitalization of the sugar industry, the concept of revitalization aims (a) expanding the sugarcane planting area by increasing productivity by increasing sugar production, (b) innovating sugar factories, (c) developing research, and (d) increasing human resources by conducting training programs to improve Human Resources.

Sugarcane factory revitalization as a solution to meet the integrity of sugar. This step is efficient to expand the sugarcane area. Centre for Agriculture Economics and Policy Research at the Ministry of Agriculture Agus Pakpahan. Sugar factory revitalization (PG) is considered a sure-fire solution to address the country's sugar needs. This step is considered efficient in addition to the government's plan to expand the sugarcane area outside of Java.

Researcher at the Centre for Agricultural Socio-Economic and Policy Studies at the Agricultural Research and Development Agency of the Ministry of Agriculture, Agus Pakpahan, is of the opinion that factory revitalization, if produced properly, will produce productive and efficient results as well as show progress. Farmers need factories to process sugar cane and factories need farmers to produce sugar cane to be processed. Almost all sugar industries (large-scale factories require large quantities of raw materials are guarantees of the overall sugar industry sustainability.
Table 1. Area PT. Perkebunan Nusantara II (PTPN 2).

| DESCRIPTION                  | 2015     | 2016     | 2017     | 2018     | 2019     |
|------------------------------|----------|----------|----------|----------|----------|
| Area                         |          |          |          |          |          |
| PTPN II Plantation TRI (Ha)  | 6,298.07 | 5,329.16 | 2,900.45 | 4,911.08 | 5,605.00 |
| Total Ha                     | 1,459.63 | 856.79   | 1,607.76 | 1,394.32 | 1,212.57 |
| Sugar cane production        |          |          |          |          |          |
| PTPN II Plantation TRI (Kg)  | 406,602.70 | 254,732.55 | 97,256.38 | 237,510 | 234,068.68 |
| Total                         | 94,267.60 | 43,551.27 | 93,581.78 | 74,890 | 64,481.09 |
| Sugar cane production        |          |          |          |          |          |
| PTPN II Plantation TRI (Ton/Ha) | 64.56   | 47.80   | 33.53    | 48.36    | 41.76    |
| Rendemen Hablur (%)          | 5.92     | 5.99     | 5.18     | 5.30     | 5.28     |
| Source: Sugar Factory Sei Semayang PTPN 2

4. Conclusions

Alternatives to Sugar Self-Sufficiency Achievement. Food Security according to Law Number 18 Year 2012 Food is the guarantor of life, while the environment guarantees the sustainability of development as a requirement for the fulfilment of food for the state to individuals. Suggestions in this paper are for PTPN 2 to increase natural resources and the quality of sugar cane so that the achievement of food security, especially in the sugar sector is achieved. Recommendation increase human resources and natural resources in order to maintain food security.

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**Acknowledgements**
This research has supported by our advisor and the students of doctoral program of law in Universitas Sumatera Utara.