

CHAPTER I

INTRODUCTION

This chapter presents the research background, problem formulation, research objectives, limitations, and the report's writing systematics.

1.1 Background

Crude palm oil is a reddish-persone vegetable oil extracted from the mesocarp, the flesh of the palm fruit of the *Elais guineensis* plant. It primarily consists of glycerides, which are composed of a series of fatty acids. The main component of palm oil is triglycerides, with smaller amounts of diglycerides and monoglycerides. At room temperature, crude palm oil is semi-solid. The reddish-persone color of palm oil is attributed to minor components of CPO in the form of β -carotene pigments. (Chew, 2021). Various products can be produced from palm oil derivative industries, such as biodiesel, soap, cooking oil, and margarine (Hambali, 2020). Crude Palm Oil (CPO) is a crucial commodity in international trade because it serves as an alternative resource to replace several non-renewable products, including extractive products from animals or plants that are becoming scarce and harmful to the environment. (Rosela, 2017).

CPO (Crude Palm Oil) is an exclusive commodity, as it is only produced by countries in specific regions, mainly tropical and partly sub-tropical areas, with a growing demand in the international market (Rosela, 2017). This increasing demand aligns with the global population growth and has led to a rise in the consumption of palm oil products, such as food items and others. The promising prospects of palm oil commodities in world trade have motivated the Indonesian government to promote the development of oil palm plantation areas. This development in Indonesia is closely connected to the government's policies that offer various incentives, particularly in licensing convenience and investment subsidy assistance for smallholder plantation development and the opening of new areas for large private plantations (Rosela, 2017).

Indonesia is the largest producer of CPO, alongside countries like Malaysia, Thailand, and Colombia (Cnbc Indonesia, 2022). CPO-producing regions can be found in almost all provinces of Indonesia. The amount of CPO produced is proportional to the overall palm oil production. According to BPS (2022), Riau and Central Kalimantan provinces have the highest number of palm oil producers in Indonesia, accounting for 19% and 13%, respectively. The distribution of palm oil production in Indonesia is illustrated in **Figure 1.1**.

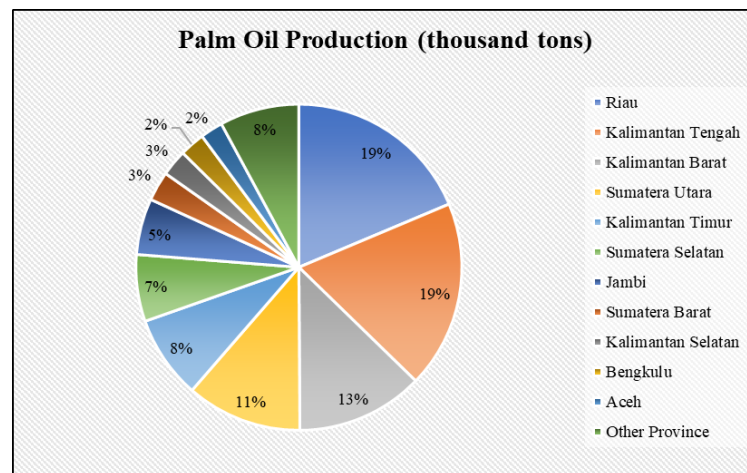


Figure 1.1 Palm Oil Producing Regions in Indonesia in 2021
(Source: BPS Indonesia, 2022)

The quantity of oil palm production is closely linked to the land area allocated for oil palm cultivation in the Republic of Indonesia. The land area dedicated to oil palm cultivation undergoes constant changes over time in correlation with the demand for oil palm. The strong desire of individuals to own oil palm plantations contributes to the projected continuous increase in oil palm plantation areas in the future. One of the factors influencing this preference for oil palm cultivation over other crops is the relative ease of planting oil palm. As the acreage expands, there will be a corresponding increase in FFB (Fresh Fruit Bunches) production. **Figure 1.2** illustrates the area of Indonesian palm oil for the period 2012 to 2021.

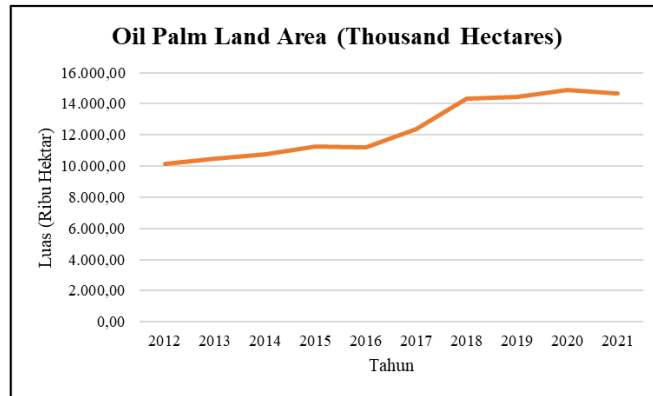


Figure 1.2 Palm Oil Area in Indonesia for 2012-2021
(Source: BPS Indonesia, 2022)

The growth of Indonesia's CPO (Crude Palm Oil) production in recent years has been consistently increasing and directly correlated to the expansion of oil palm plantations. Indonesia is an active participant in international trade and is renowned for being a major exporter of agricultural industry products, particularly in the plantation subsector. CPO is prominent as Indonesia's leading export commodity due to its highest production level globally (Maygirtasari et al., 2015). The quantity of Indonesian exports has steadily risen yearly, as depicted in **Figure 1.3**.



Figure 1.3 Number of Indonesian CPO Exports from 2012 to 2021
(Source: BPS Indonesia, 2022)

As a significant palm oil-producing country globally, Indonesia has recently encountered issues with palm oil-derived products, particularly cooking oil. There has been a scarcity reported from PSPD UGM (2022), which started in early October 2021, leading to a significant increase in the price of cooking oil in

Indonesia. According to data from the National Strategic Food Price Information Center, on October 7, 2021, the price of cooking oil was only IDR 15,550/Kilogram. However, by early January 2022, the price had risen to IDR 18,550/Kilogram. Branded packaged cooking oil reached an even higher price of IDR 21,150/Kilogram. Despite the government's efforts to address the issue through policy interventions, such as raising the cooking oil export tax, relaxing the 30% biodiesel policy, and conducting market operations, the scarcity of cooking oil persisted until March 2022 (Indonesia Corruption Watch, 2022).

The scarcity of cooking oil is attributed to the production's inability to meet domestic demand, and various theories have emerged to explain the scarcity. Among these theories, one perspective suggests that the causes of scarcity are linked to the increase in the price of CPO as a raw material for cooking oil, the presence of palm oil expeditions, and the chaotic distribution system (Kompas, 2022). Another viewpoint attributes the scarcity of cooking oil to the rise in global vegetable oil prices and the implementation the B30 policy. The B30 policy mandates fuel oil companies in Indonesia to blend 70% diesel fuel with 30% biodiesel (PSPD UGM, 2022). According to Kontan.co.id (2022), the scarcity of cooking oil is influenced by trade problems, especially in the face of increased CPO prices in the international market, the policymakers' inability to control CPO supply to meet domestic needs, and the lack of accurate data on cooking oil production and consumption. This oil scarcity poses a significant problem for people as cooking oil is a daily necessity, leading to losses for individuals, panic buying, and hindrances for small and medium-sized enterprises (UMKM). Thus, the government must address this issue promptly.

Given the complexity of various problems, it becomes essential to research to understand the dynamics of processed CPO products, particularly cooking oil. These dynamics can be analyzed using the system dynamics approach. System dynamics is a methodology that can describe processes, behaviors, and complexities within a system (Sa'adah et al., 2017). It is used to understand how factors change over time. For instance, changes in the population can lead to an

increased demand for cooking oil and other CPO-derived products, subsequently affecting the available CPO stocks in the market. Apart from the population, other element also influence the CPO stocks in the market and the demand for cooking oil. The system dynamic approach is used because the cooking oil sufficiency system operates on closed feedback. Higher demand for cooking oil compared to its adequacy results in a scarcity of cooking oil, necessitating an increase in cooking oil production. System dynamics are used to create models that simulate the behavior of the CPO supply chain system and forecast the future supply conditions of the CPO chain. These models focus on production, operating revenue, and business costs (Lembito in Pasha, 2017). Additionally, the system dynamics approach can be applied to simulate the condition of the CPO supply chain in the next ten years. The outcomes of this study are expected to provide valuable policy recommendations for the government to address the scarcity of cooking oil, ensuring that domestic needs are adequately met.

1.2 Problem Formulation

The problem formulation in this study is how to modelling the scarcity of cooking oil, so cooking oil supply can fulfillment market needs. Policies will be formulated concerning various element related to the cooking oil supply chain. These policies are designed based on current phenomena to ensure the fulfillment of the market.

1.3 Research Objectives

The research aims to achieve three main objectives:

1. Identify the element influence cooking oil scarcity within the supply chain.
2. Develop a model to simulate and understand the dynamics of cooking oil scarcity.
3. Planning policies based on several scenario conducted earlier to overcome cooking oil scarcity.

1.4 Research Limitations

The limitation of this research is that the system only covers from oil palm plantations to domestic consumers.

1.5 Systematics

The systematics of writing the report used in this study consists of several chapters, namely:

CHAPTER I - INTRODUCTION

It contains the background of the research, problem formulation, research objectives, research limitation, and systematics of writing reports used in the research.

CHAPTER II – LITERATURE REVIEW

Contains a collection of terminology and concepts used as a basis for conducting research and various previous studies.

CHAPTER III - RESEARCH METHODOLOGY

Contains the stages carried out in the implementation of research.

CHAPTER IV – SYSTEM MODELLING DESIGN

Contains the stage to make model simulations and validations of system

CHAPTER V – SYTEM MODEL ANALYSIS

Contains creating of scenario design, policy implication scenarios, and scenario selection.

CHAPTER VI – CONCLUSION

Contains conclusion and recommendations of research.

