Biofuel Policy and Politics in Indonesia:

How Large Agro Industries Gained Favour from Government Biofuel Policy

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I certify that all material in this thesis which is not my own work has been identified and that no material has previously been submitted and approved for the award of a degree by this or any other University.

Signature: …………………………………………………………..

Abstract

The overall aim of this research is to conduct an in-depth study of the political construction of biofuels in Indonesia and explain the implications for understanding the development of the contemporary biofuel industrial complex. The research focuses on building understanding of the role of politics and the materiality of crops in the development of agro-fuel alliances. The overall argument is that the alliance between biofuel and large agro industries did not happen as a form of capitalization on biofuel policy by private stakeholders, but instead involves interactions between complex political process within government and both the biofuel and agricultural feedstock industries. The research combines concepts from political ecology and agrarian political economy to create a conceptual basis for understanding the political processes underlying the biofuel nexus in Indonesia. The study involved an abductive analysis conducted as a means of interpreting the complex data used in this research, which included policy documents, interviews and field observations.

The research concludes that though the Indonesian government created policy initially intended to use biofuels as means to solve problems of energy security, environment and rural poverty, ultimately policy (both directly and indirectly) resulted in outcomes that favoured the emergence of alliances between biofuel companies and large agro industries. Such alliances did not result in the resolution of the problems that the government initially set out to address. The research shows how the bonding between biodiesel and palm oil agro industries were, in part, created through both historical and contemporary policy processes. However, ultimately the analysis reveals the significance of inertia and insufficient political will in the implementation of biofuel policy for the emergence of agro-fuel alliances and failures to address the core policy problems of energy security, environment and rural poverty.

Keywords: Biofuels, Political Ecology, Agrarian Political Economy, Indonesia, Energy Politics

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List of Acronyms

APE = Agrarian Political Economy

BPS = *Badan Pusat Statistik*

BPDPKS= *Badan Pengelola Dana Perkebunan Kelapa Sawit*

CPO = Crude Palm Oil

DEN = *Dewan Energi Nasional*

EBTKE = Energi Baru Terbarukan dan Konversi Energi

EU = European Union

FAME = Fatty Acid Methyl Esther

FE = Fuel Ethanol

GAIN = Global Agricultural Information Network

IE = Industrial Ethanol

IZ = Industrial Zone

MEMR = Ministry of Energy and Mineral Resources

MoF = Ministry of Finance

PE = Political Ecology

PFAD = Palm Fatty Acid Distilate

PTPN = Perseroan Terbatas Perkebunan Nusantara

RDBPO = Rinsed, Deodorized, Bleached Palm Olein

SOE = State Owned Enterprise

Declaration

I, Arie Yanwar Kapriadi, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

Signed,

Acknowledgement

Praise be to Allah; The Cherisher and Sustainer of the Worlds; Most Gracious, Most Merciful. He is the only one who has given me the ability to do this work.

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Chapter One

Introduction

The overall aim of this research is to conduct an in-depth study of the political construction of biofuels in Indonesia and explain the implications for understanding the development of the contemporary biofuel industrial complex. The Indonesian context is one where policies that were intended to solve the country's energy security problem, while also reducing rural poverty, have become manifest as policies that largely align with the interests of large palm oil industries. This thesis argues that this is not an inevitable outcome of industry manipulation but was made possible through a confluence of political, social and material actions over time. The research shows how the underlying politics and materiality of the crops used to produce biofuels (i.e. sugarcane for bioethanol and palm oil for biodiesel), as well as the market structure within which they are produced, combined with wider inertia within the political system to shape and reshape contemporary biofuel policy. The overall argument is that the alliance between biofuel and large agro industries did not happen as a form of capitalization of biofuel policy by private stakeholders, but instead involved interactions between complex political processes within the government and both the biofuel and agricultural feedstock industries.

The thesis builds from existing work on the politics of biofuels in Indonesia that has addressed questions primarily from either a political ecology or political economy perspective. I argue that though research grounded in each of these traditions is important for understanding the processes and implications of biofuel policy, combining them offers greater conceptual insights into questions concerning the construction of the current biofuel complex.

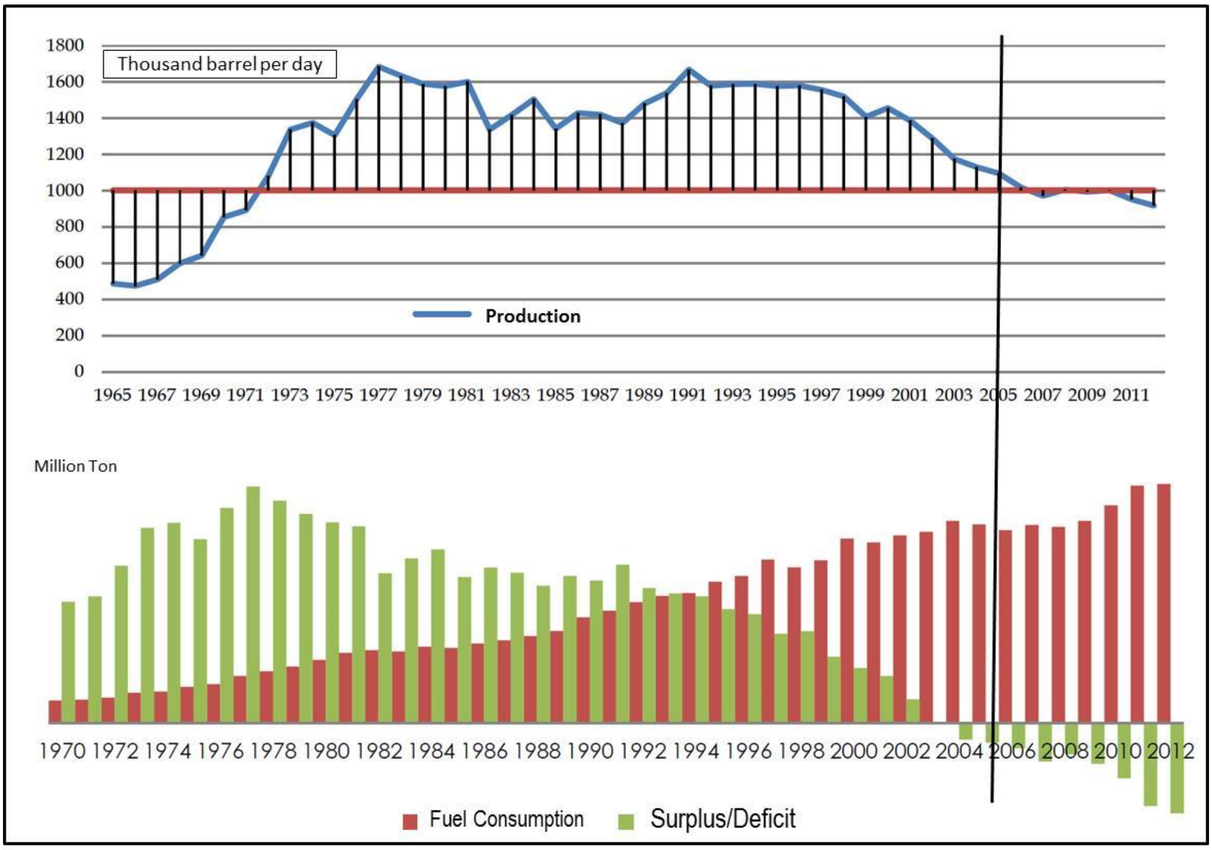
This introductory chapter is comprised of four sections. The first section discusses the research background, characterising the key issues that have shaped Indonesia's biofuel policy, focusing on the importance of narratives about energy security crises, environmental degradation and rural poverty. The second section introduces the research questions that the thesis aims to address. The third section explains the Indonesian case study and provides details on the research context. Finally, the structure of the thesis is explained in the last section.

1.1. Indonesia's Energy Crisis: Searching for a Fossil Fuel Alternative

Indonesia relies heavily on energy from natural resources such as oil, coal and timber to support its economic development. According to Indonesia's budget statistics (Ministry of Finance, 2004), the oil and gas sector from 1970 to 2000 had contributed on average 38.0 percent to government revenue and 19.8 percent to the country's GDP. This makes oil and gas the most influential sector of Indonesia's economy. From 1971 to 1999, Indonesia produced more than 1.5 million barrels of oil per day and was a member of the Organization of Petroleum Exporting Countries (OPEC) (Nasir, 2014). However, oil production has been steadily decreasing since 2000, and with an average depletion rate of 10-12 percent per year and the failure to find a new oil reserve, Indonesia's oil production has, since 2005, shrunk to below one million barrels per day (Bappenas, 2014; Nasir, 2014). In line with the decrease in oil production, its impact on government revenue and contribution to GDP has decreased to approximately 23 percent and 8.7 percent respectively over the last decade (Ministry of Finance, 2015).

In this context, instead of refining its crude oil production to fulfil domestic consumption and exporting its excess abroad, Indonesia's government has developed a policy to export most of its crude oil production and import fuel, such as gasoline, diesel and kerosene for domestic consumption (Nasir, 2014). Although there is no clear explanation why Indonesia has implemented this policy, it is implied that the government only exported the excess of oil production and used the revenue to import fuel. Moreover, the government also subsidized domestic fuel prices with the intention of stabilizing the domestic price and protecting those people on low incomes (MoF, 2004, 2008, 2009).

Figure 1.1
Indonesia's Oil Production and Revenue Balance



Source: BP Statistical Review 2013 in Nasir, 2014 (reproduced)

The policy of exporting oil, while importing and subsidizing fuel has been implemented since the 1970s when Indonesia produced more than 1 million barrels of oil per day and domestic fuel consumption was still below 400 thousand barrels per day (Ministry of Finance, 2004; Rakhmanto, 2006; Nasir, 2014). Thus, the government still received profit from exporting oil despite having to import and subsidise fuel for domestic consumption **(Figure 1.1)**. However, the government did not increase its oil refining capacity to meet domestic fuel consumption although it was continuously increasing - with a growth rate of 6.1 percent annually from 1970 to 2012 (Dartanto, 2012; Nasir, 2014). There is currently very little understanding as to why the government was reluctant to build more oil refineries at that time to meet domestic fuel demand (Rakhmanto, 2006, 2012).

Although the fuel subsidy policy was initially designed to support people on low incomes, it had major weaknesses. Firstly, as the country's economy grew, so did fuel consumption, putting pressure on the government's budget allocation for other public spending (Ministry of Finance, 2015). Secondly, the fuel subsidy did not reach its main target, low income people, because these people did not own private transportation. Conversely, fuel subsidies were primarily enjoyed by middle and upper income groups because they were the ones that usually owned private transportation (Dartanto, 2012). Thus, the benefit of the fuel subsidy did not directly reach its target population.

Nonetheless, there would be negative consequences for those on low incomes if the fuel subsidy was reduced. This is because reducing the subsidy would result in high inflation because overall transportation costs would increase, which would, in turn, cause an increase in the price of goods and services, such as food prices and commuting costs. This would detrimentally impact low income groups. As a result, any government policy to reduce the fuel subsidy has become a sensitive political and social issue. Thus, the government's efforts to reduce the burden of the fuel subsidy on the public purse became subject to intractable problems amid deep concerns that, were it to drastically reduce the fuel subsidy, it could cause political and social upheaval within the country.

Furthermore, Indonesia's macro-economic policies were heavily influenced by geopolitical issues internationally, such as the American war with Iraq in 2003 and the global financial crisis of 2008. These major global events would affect the oil price and subsequently the amount of fuel subsidy. Although the volatility of oil prices influenced government revenue from oil production, the primary issues concerned dwindling oil production, which caused any revenue received to become much smaller than government expenditure on the domestic fuel subsidy. This meant, however, that it was even more difficult for Indonesia to overcome the impact of global economic events and policies that affected the international price of oil and currency volatility (Ministry of Finance, 2008, 2012, 2013).

Despite the volatility of both the currency and the international oil price, the government managed to reform the fuel subsidy policy several times between 2005 and 2015. Nevertheless, only the last fuel subsidy reform implemented in 2015 had significant impact, as the amount of the fuel subsidy decreased substantially from approximately 13 percent of government spending in 2014 to just above 3 percent in the 2015 budget (Ministry of Finance, 2015). This significant reform was successfully implemented partly because of the favourable impact of a sudden drop in the oil price at the end of 2014 and despite the fact that government revenue from the oil sector was also decreasing.

Before 2015, however, subsidy policy reforms were merely implemented as a means to ease the budget pressure due to the volatility of international oil prices and the consequences of importing and subsidizing fuel. Such policy had also become a political commodity where the voice of those in favour of continuing the fuel subsidy gained favour from the people, especially during a national election. This would be the case particularly between 2005 and 2010 as the combination of a skyrocketing oil price, failure to find new oil reserves and invest in refineries, as well as failure to completely remove the fuel subsidy, resulted in significant pressure on both the government budget for subsidising fuel and on the trade balance for importing it (Dartanto, 2012; Nasir, 2014; Rakhmanto, 2012). Thus, the scene was set for the government to become focused on seeking to establish an alternative fuel source to reduce this burden with minimum consequences.

Biofuel was initially adopted as part of the country's renewable energy policy, arguably, because it was the only renewable energy resource suitable for combustion engines in vehicles such as cars, buses and trucks without these vehicles requiring further modification (Foidl et al, 1996; Mol, 2007; Lubad & Widiastuti, 2010). This means biofuel can utilize the current infrastructure used by the fossil fuel market and allow fossil fuel consumers to switch to biofuel with minimal to zero cost. Thus, the emergence of biofuel has created a new opportunity for the Indonesian government due to its potentiality to reduce the country's dependency on fossil fuel.

The implementation of the biofuel policy was constructed as bringing a double economic benefit arising from a reduction of subsidies on the one hand and an improvement in the trade balance (by reducing fuel imports) on the other. Moreover, it was highlighted for its role in reducing the country's carbon emissions and increasing rural farmers' incomes (Mol, 2007; Ministry of Finance, 2013). Thus, biofuel development was ultimately cast not only as a renewable energy policy that could solve the Indonesian energy security problem relating to transport, but also as a way to bring balance between meeting energy demands, environmental preservation and increasing people's welfare.

However, biofuel policy went through drastic changes within a decade after being implemented. These changes saw large agro industries gain significant advantage and the government fail to achieve any of the purported policy targets besides the reduction of the fossil fuel subsidy due to the reasons stated above. Initially, the government promoted non-edible feedstock to develop the biofuel industry - sugarcane for bioethanol and jatropha for biodiesel. Yet, the government eventually came to rely on the palm oil industry to support its biofuel policy. Moreover, despite the government's attempt to develop both the bioethanol and biodiesel industries, only the latter prevailed as it was supported by the palm oil industry. Interestingly, despite Indonesia's status as the world's major palm oil producer, it did not necessarily mean that the government achieved its policy target of solving energy security problems. The problem of a trade deficit from fuel imports still exists.

Thus, the hegemony of the palm oil industry over Indonesia's biofuel policy suggests that there is a political dynamic within the biofuel complex that creates such a condition. However, existing knowledge evident within the literature, which will be discussed in Chapter 2, is insufficient to explain the dynamic of Indonesia's biofuel policy. This research attempts to fill this gap in the literature. The next section discusses the focus of the research along with the questions that will be answered in the thesis.

1.2. Research Focus, Questions and Objectives

In many countries around the world, biofuel policy has purportedly been designed with the purpose of addressing issues of both energy security, needed to retain related economic growth, and carbon emission reductions (Mol, 2007). In the context of Indonesia, however, instead of reaching this goal, biofuel policy has become deeply aligned with the interests of the palm oil industry. The Indonesian government is still unable to meet its mandatory biofuel blending policy - intended to address energy security problems - despite the abundance of palm oil available for biofuel feedstock, and the development of biofuels has, in practice, caused increases in carbon emissions through forest fires and land use change. Much of the existing research on biofuels in Indonesia has focused on these consequences of biofuel development and associated problems of environment and social justice. Where the focus has been on politics and policy related to biofuels (rather than its outcomes), the emphasis has been on showing industry co-option of biofuel policy to align with its own interests. By contrast, this research explores the tensions and interactions between different actors involved in biofuel development revealing how these relations have shaped and reshaped contemporary biofuel policy in ways that cannot be attributed wholly to industry manipulation. Thus, this research aims to conduct an in-depth study on the politics of biofuel policy, examining the key factors that shape the contemporary trajectory of Indonesia's biofuel policy. In order to reach this goal, this research has four interrelated objectives.

1. To examine the history of relevant transformations and policies in Indonesia in order to build insight into the implications of longer-term political trajectories for modern day biofuel policy and production.

2. To understand how the material development of different types of biofuel (i.e. bioethanol and biodiesel) plays a role in government policy and associated outcomes related to the biofuel industrial complex.

3. To understand the underlying politics shaping the biofuel energy nexus and the way it has influenced the trajectory of biofuel policy.

4. To examine the interconnections between industry and government and how these relations (re)shaped biofuel policy to favour particular actors and materials.

Based on the objectives of this research, the discussion focuses on the politics engulfing biofuel policy from the initiation of relevant policies to the recent situation, where outcomes are very much aligned with particular industries' interests. The research has one overarching question, which is also embedded in the research title "How have large agro industries gained favour within the Indonesian government's biofuel policy?". In an attempt to fully answer this question, there are three sub-questions around which the analysis is structured.

1. How has the longer-term history of agrarian development and policy in Indonesia shaped modern day biofuel production?
2. How has the biofuel industry and its market structure reshaped contemporary Indonesia's biofuel policies?
3. How are politics and political processes enacted by actors involved in the biofuel energy nexus in ways that have shaped biofuel policy and practice in particular ways?

The analyses in this thesis will contribute to the existing literature in three primary ways. Firstly, it contributes to the body of literature in political ecology and agrarian political economy through building insights into the underlying politics of biofuel policies. The research discusses factors, such as the importance of the market and historical agrarian policy, that have often been neglected by researchers working from political ecology and economy perspectives. Through the thesis I argue that both of these factors have been highly influential in shaping and reshaping the trajectory of biofuel policy.

Secondly, this research also produces insights that will be beneficial for policy makers in helping them to understand the factors that influence the success and failure of biofuel policy. It also provides understanding of the different facets of the biofuel industry, which could help policy makers to formulate policy in accordance with different industry needs.

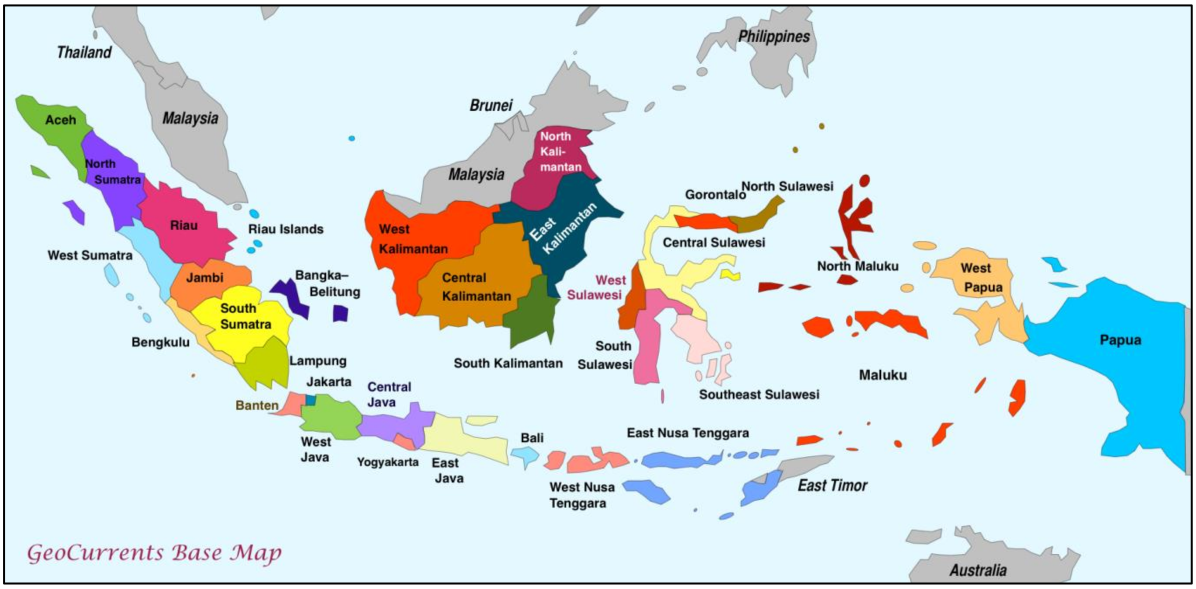
Finally, this research is using Indonesia as a case study, where the contemporary politics of biofuels has been overlooked somewhat within existing research, despite its global importance to the industry. The current biofuel case studies on Indonesia have often focused on industrial development alone (e.g. Nurdyastuti, 2005; Wardhani and Pertiwi, 2013) and/or environment and social justice issues arising as a result of biofuel development (e.g. Silitonga et al., 2011; Obidzinsky et al., 2012). With a few notable exceptions (e.g. Amir et al., 2008; Afiff, 2014), there is a clear gap in the literature concerning the contemporary politics of biofuels in Indonesia.

1.3. Introducing Indonesia as the Biofuel Case Study

This section introduces Indonesia as the case study location for examination of biofuel policy in this thesis. Indonesia is an archipelagic country in South East Asia and the largest archipelagic country in the world which consists of 17,508 islands with an area of 1,904,569 square kilometres where 95% of it is a land area

(Frederick and Worden, 2011). There are five main islands in the country namely Sumatra, Java, Kalimantan, Sulawesi and Papua where all monoculture plantations are located. With a population of more than 245 million people, Indonesia has the fourth largest population in the world (United Nations Data Booklet, 2017). The country is divided into 34 provinces where each province has its own legislature and an elected governor (The Jakarta Globe, 2012). Provinces are then subdivided into regencies (*kabupaten*) and municipalities (*kota*). Each of these subdivisions has its own legislature and elected head of regency (*bupati*) and mayor (*walikota*) for the regency and municipalities respectively. Both provincial divisions and the further subdivisions are called regional government.

Picture 1.1
Provinces of Indonesia



Source: http://www.geocurrents.info (downloaded in 2019)

The subdivision of provinces is further divided into districts (*kecamatan*) and each of these is divided again into villages. As the lowest level of government administration, villages are unique in their governance arrangements. There are two types of villages that share the same government administrative level under the district but are different politically, socially and economically. These types of village are called *desa* (rural) and *kelurahan* (sub-district). Thus, the term 'rural' in this research refers to *desa* not only to differentiate the geographic scale, but also the local political entity.

What makes *desa* distinct is the agrarian culture of its economy, with *desa* being heavily reliant on small scale plantations for their local economic and social wellbeing. Such plantations are either dominated by food crops, such as rice and vegetables, or revenue crops, such as sugarcane and palm oil. In general, farmers reliant on the agro based economy have considerably lower welfare than those living in urban areas. These agrarian communities, in particular, came to play an important part in biofuel policy and politics, as will be discussed in Chapter 4.

Figure 1.2
Political System Timeline in Indonesia

Cultivating system during colonial period	Japannese occupation and war of independence	Soekarno's regime	Soeharto's regime	Democratiz ation era
1830-1942	1942-1948	!949-1967	1968-1997	1998-now

Source: Author's produced

To investigate the geography of crops used for biofuel, it is important to also understand the different political periods in Indonesia (**Figure 1.2**), which will be further elaborated in Chapter four. The thesis will highlight how the legacy of the previus policies has a profound effect on the current spread of the crops used for biofuel feedstcok on the major islands in Indonesia. These crops would be palm oil as biodiesel feedstcok and sugarcane as bioethanol feedstcok.

Palm oil plantations are located in 23 out of 34 provinces in Indonesia across the five major islands Jawa, Sumatra, Kalimantan, Sulawesi and Papua. These plantations were developed at different times within the different islands. Those established on

Sumatra Island particularly in the North Sumatra Provinces are considered to be the first palm plantations created in Indonesia (Fauzi et al., 2012). Meanwhile, palm plantations created on Papua Island are considered to be the most recently established (Obidzinsky et al., 2012). This has had implications for the impact of the plantations within the different regions. Whilst in regions where palm oil plantations have been established for a long period, they have been mutually beneficial both socially and environmentally, in other regions especially where the plantations are newly established, the effects have been the opposite (ibid). This makes conducting research on Indonesian biofuel development both interesting and challenging due to the many palm oil plantations that have been established over many years. Chapter 3 will include detailed discussion of these distinctive challenges for researching biofuels.

Whereas palm plantations are established on all major islands, sugarcane plantations are found predominantly on Java Island, particularly the East Java Province (Ministry of Agriculture, 2014). This is related to the historical development of farming in Java and the long history of sugar cane plantations on the island, dating back to the 17th century when sugar cane was introduced by European and Chinese traders (Knight, 2018). At that time, the rural farmers produced sugarcane-based sugar as a revenue crop, while they used palm-based sugar for daily consumption. Thus, farmers planted sugarcane as a side crop alongside their primary crop of rice; this was a practice that continued for two centuries. Thus, having planted sugarcane for generations the farmers were already highly adept at growing this crop. This history had implications for the shape of agrarian policy, which will be discussed in-depth in Chapter 4.

The Indonesian case study of biofuel policy offers unique insights due to the dynamic politics of biofuel in the country and relative wealth of biofuel crops. Indonesia has well established sugarcane and palm oil plantations and has implemented policies designed to stimulate growth of other biofuel feedstocks, such as Jathropa. This wealth in biofuel feedstocks has seen the country emerge as the largest palm oil producer in the world. However, Indonesia is still unable to meet its domestic biofuel targets. I will argue that this is, in part, reflective of political tensions related to the relationship between biofuels and their feedstock. This will be examined in depth within this thesis

1.4. Thesis Structure

This thesis is composed of eight chapters beginning with this introductory chapter. **Chapter 2** reviews the relevant literature setting the context for biofuel research and for this study in particular. It begins with discussion of biofuel, particularly regarding its promise versus the reality of the implementation of the policy. It then reviews the literature within political ecology and its current discussion about biofuel policy and politics where large agro corporations have managed to profit from the policy. It also reviews the literature in agrarian political economy since it gives greater understanding about the interrelation between the government, farmers and large agro-industry. These strands from the literature in both political ecology and agrarian political economy create the research opportunity that becomes the core analysis in this research.

Chapter 3 discusses the methodology used in this research, which involves a qualitative ‘abductive’ approach (Dubois and Gadde, 2002; Timmermans and

Tavory, 2012). This chapter explains the case study location of the research and provides justification for its selection. It then explains the research design and strategy for conducting the research and details the methods, including interviews, field observations and document analysis. It ends with discussion of the data analysis and writing process.

The first of four empirical chapters, **Chapter 4** discusses the influence of historical agrarian policy on contemporary biofuel policy in Indonesia. The analysis begins with a focus on colonial rule and practices that saw sugarcane crops emerge in the country and farmers with small holdings ultimately become the backbone for a large industry that was the hallmark for Indonesia's subsequent agrarian policy in the 1970s to 1980s. The analysis discusses the different crops used in contemporary biofuel policy (i.e. sugarcane and palm oil) and reveals how the agrarian policy in the 1970s and 1980s shaped their performance and reshaped the implementation of biofuel policy. This chapter argues that past agrarian policy is an important factor in shaping the performance of the biofuel industry and in ultimately leading to the particular outcomes that are seen in contemporary biofuel policy - namely support for palm oil, despite the initial intentions.

In **Chapter 5** the focus is on the interconnections between historical agrarian policy and politics and the contemporary performance of the biofuel industry as it relates to the structure of the market for feedstock crops. This chapter highlights the importance of an integrated and cohesive agro-industry as an essential condition to support the biofuel industry. Besides analysing the market structure for the two primary biofuel crops in Indonesia (i.e. palm oil and sugarcane), it also analyses the different production processes of the forms of biofuel associated with each crop (i.e. bioethanol and biodiesel), showing how this is another factor that has shaped the implementation of biofuel policy. This chapter also addresses the politics of knowledge, showing the importance of understanding the technical aspects of the production processes within government for policy implications to be better anticipated and intentions realised in practice.

The remaining two empirical chapters focus on the contemporary context and the politics of biofuels. **Chapter 6** addresses issues of policy conflict and fragmentation showing how this had major implications for the shape of contemporary biofuel policy. This chapter also explores the political dynamics of biofuel policy and, in particular, looks at the role of political elites in contributing to the development of contemporary biofuel policy. In this regard, the chapter draws conclusions related to challenges of political will within political elite groups as core to key failures and (unintended) policy outcomes.

Building on the previous chapter, **Chapter 7** explores government politics as they relate specifically to the palm oil industry and highlights how the political dynamics provided openings for the agro palm industry to opportunistically take advantage of government biofuel policy. This chapter discusses the crucial role that policy played (however unintentionally) in shaping the biodiesel industry and eventually providing the foundations for an agro-fuel alliance between the palm and biodiesel industries. The chapter ultimately provides further support for the core arguments relating to contemporary governance and problems of political will amongst elites.

Finally, **Chapter 8** synthesizes the research findings and core arguments. It highlights the findings from each empirical chapter and narrates the connections between the different insights produced. This chapter reflects on the challenges and limitations of the research and suggests some future research that could potentially be conducted using this research as its foundation. Finally, a set of recommendations are made that could potentially improve the current condition for Indonesia's biofuel policy.

Chapter Two

Conceptualizing Agro-Fuel Alliances:

The Politics of Biofuel

The purpose of this chapter is to review the literature on the politics of biofuel, focusing on the importance of both agricultural and biofuel production industries. As an innovation, biofuel is often sold as the panacea to problems of governments in both developed and developing countries eager to acquire the anticipated benefits. However, review of the current literature discussing biofuels shows how politics that cut across the interests of state actors and large corporations have led to the rise of agro-fuel alliances that could possibly be the cause for such an innovation being unable to deliver on its promise. Much of the existing literature is grounded in political ecology and agrarian political economy, as such, this review draws together two strands of literature in order to build a basis for analysing agro-fuel alliances.

The chapter is divided into five sections. The first section discusses literature that highlights the way biofuel policies and practices have shifted away from their ‘green’ trajectory and exacerbated the problems that they are supposed to solve. The second and third sections examine the literature on political ecology and agrarian political economy and discuss key themes relevant to understanding agro-fuel alliances, which are a central focus for these biofuel policy studies. The fourth section discusses the two key aspects of agro-fuel alliances identifiable within the literature; firstly, the power of large capital and secondly the government relationship with large industries. Finally, the chapter closes by introducing the identified knowledge gap within the existing body of literature that the current research aims to address.

2.1. The Promise and the Critiques of Biofuel Policy

Multiple countries around the world have implemented biofuel policies due to their promise to be a panacea for tackling environmental (e.g. climate change) and economic development problems, but research has shown how often such policies have merely exacerbated these existing problems. In this context, biofuels have become a hotly contested tool of sustainable development (Searchinger et al., 2008; Cherubini et al., 2009; Fargione et al., 2008; Fernandes et al., 2010; Ariza-Montobbio et al., 2010; Obidzinsky et al., 2012). This section will discuss existing analyses of biofuel policies and the arguments that have been put forward to suggest they have been ineffective in resolving key issues relating to the environment and economy. This will set the context for the thesis and for the analysis of the biofuel energy system in Indonesia.

Studies in the field of chemical engineering, biology and economic and environmental sociology argue that biofuels are an ecological innovation for solving problems relating to the economy and environment (Foidl et al., 1996; Huber, 2008; Janicke, 2008; Silitonga et al., 2011). Environmental sociologists and ecological modernization theorists such as Arthur Mol (2007) and Joseph Huber (2008) claim that countries such as USA, EU and Brazil are implementing biofuel policies to reduce fossil fuel dependency, reduce carbon emissions and increase rural farmers' incomes. Biofuel is also positioned as a cheaper substitute for fossil fuels. In this context, biofuel is perceived as a ‘silver bullet’ for solving problems of energy security, rural poverty and climate change (Fatimah, 2015).

Added to this, it has been suggested that governments anticipate that the growing interest in biofuels will eventually create new biofuel industries, establish new markets and stimulate domestic economic growth (Ernsting, 2007). This makes pursuing biofuel policies favourable for both developed and developing countries, where developed countries would use biofuels as a way of reducing fossil fuel consumption and developing countries would use biofuel as a way to increase economic growth by either producing biofuel or its feedstock (Oliviera et al., 2017). Based on this, it is possible to conclude that a set of high expectations has been placed on biofuels. Thus, countries that want to develop biofuel industries utilize a variety of policy instruments to create growth within the sector (Amir et al., 2008; Ariza-Montobbio et al., 2010; Mol, 2007; Holt-Gimenez and Shattuck, 2009).

Most of the countries that develop biofuel industries such as Brazil, the USA and EU states use a national policy approach, such as mandatory blending of biofuel with fossil fuels, subsidies to the biofuel industry and export taxes for biofuel products (Oliviera et al., 2017). Implementation of such polices has successfully positioned those countries as major players in the global biofuel energy system as both producers and consumers (Mol, 2007). However, some biofuel policy studies in developing countries such as India and Indonesia showed that instead of creating national policies, the central government used a direct approach to farmers and smallholders to plant certain crops to be used as biofuel feedstock (Amir et al., 2008; Ariza-Montobbio et al., 2010; Fatimah, 2015). Thus, instead of creating policies to incentivize the biofuel industry to grow, the governments in both countries are actively advertising biofuel as a profitable endeavour for rural farmers. These different policy approaches show the governments' clear intentions towards developing their respective biofuel industries.

However, Castan-Broto (2015) asserts that implementing a low carbon transition policy could create an inconsistent result between the policy expectation and the outcome emerging from the policy implementation - and biofuel policy is one example. Whilst biofuel is able to deliver its promise of reducing fossil fuel dependency by increasing the use of renewable fuels as proposed by its proponents (e.g. Mol, 2007; Huber, 2008; Ernsting, 2007), analyses using the lenses of political ecology and agrarian political economy have shown that government support for biofuel policies has, in many instances, created an alliance between biofuel industries and large agro-companies (White and Dasgupta, 2011; Ariza-Montobbio et al., 2010; Holt-Gimenez and Shattuck, 2009; Obidzinsky et al., 2012; Oliviera et al., 2017). Holt-Gimenez and Shattuck (2009) have examined multi-case studies on biofuel policies in countries such as Columbia, Brazil and USA, and argue that biofuel policy has become a lucrative business opportunity for capital-rich private stakeholders. This is because biofuel industries are benefiting from government subsidies and mandatory blending mandates, which lowers their business risk while ensuring profit for these companies (Oliviera et al., 2017). Holander's (2011) study on biofuel policy in Brazil has also shown how policies that were implemented have created an alliance between agro companies and biofuel industries. The alliance was able to successfully capitalize on biofuel policy implementation in foreign markets (such as in the USA) as overseas demand for biofuel was high while local biofuel industries were unable to fill the demand. This suggests biofuel policies have frequently generated lucrative business opportunities for large agro-companies. Thus, an unexpected consequence emerged as biofuel policy became a policy that was capitalized upon by the alliance between biofuel industries and large agro industries.

Political ecologists and agrarian political economists have also criticised government biofuel policies that sought to empower rural farmers (Amir et al., 2008; Ariza-Montobbio et al., 2010; Fatimah, 2015). Studies conducted by Amir et al. (2008) and Fatimah (2015) on Indonesia's biofuel policy have shown that the government's attempt to use farmers to plant jatropha, a crop designated to be a biofuel feedstock, culminated in total failure since the domestic biofuel industries did not want to buy the crop from farmers. Instead, the industries preferred to buy crude palm oil (CPO) from the local palm oil industry since it is much cheaper and more abundant. Both Amir et al.'s (2008) and Fatimah's (2015) studies have shown that the biofuel industry would prefer to be supplied by large agro-industry rather than small scale farmers, as the former can provide a more reliable and cheaper feedstock material for the biofuel industry than the latter. Another similar study highlighting the failure of using farmers as biofuel industry suppliers was conducted by Ariza-Montobbio et al. (2010) in India. Their study found that the biofuel industry prefers to be supplied by farmers with large capital rather than small farmers despite them all planting the same crop, jatropha. These studies have shown that using rural farmers to support the biofuel industry has often not been viable, since they could not produce the feedstock materials abundantly or cheaply enough for the industry. Conversely, large plantations do not have any difficulties in filling the industry's demands due to their ability to scale-up production and be more efficient compared to rural farmers (Ariza-Montobbio et al., 2010; Castelanos-Navarette and Jansen, 2015). The biofuel case studies on jatropha in India and Indonesia have shown that biofuel industries would rather ally with large agro industries than small holding rural farmers despite governmental efforts to promote rural farmers as biofuel industry feedstock suppliers.

The promise of biofuels as a route to address climate change has also created a contradiction. Analyses of the life cycle of biofuels show that biofuel production could only result in zero carbon emissions if its feedstock is planted on land without replacing any existing vegetation (Searchinger et al., 2008; Cherubini et al., 2009; Fargione et al., 2008). However, research shows how the implementation of biofuel policies has caused increasing demand for feedstock crops, such as sugarcane, palm oil, rapeseed and soy. This demand has been met by increasing production through expanding plantation sizes, often in areas of important existing value in terms of carbon absorption such as rain forests (Fernandes et al., 2010). For example, studies in emerging market countries such as Brazil (Lima et al., 2011) and Indonesia (Varkkey, 2012) have highlighted the actions of agro-companies expanding plantations in place of adjacent pristine forest. Even if biofuel production does not replace pristine forest in favour of feedstock plantations, Pineiro et al.'s (2009) biofuel study in USA found that land use changes for biofuel feedstock expansion can still cause net carbon emission release. Their study used time series data of farm plots used to plant diverse types of crops and compared them with those used exclusively for a single crop to produce biofuel. They found that the former had a better result in terms of sequestering carbon than the latter. Thus, biofuel production that is expected to reduce carbon emissions by using a renewable energy source, has unexpectedly released more carbon into the atmosphere due to the negative impact on land conversion and monoculture farming techniques.

Political ecology scholars have also pointed out social justice problems, such as land grabbing and conflict with large agro companies, as consequences of political support for biofuels. Fernandes et al. (2010) highlight how the expansion of sugarcane plantations in Brazil, encouraged through the government's ambition to increase biofuel production, has led to agro-companies renting farmers' land for sugarcane cultivation. This has ultimately resulted in overuse and deterioration of the land due to plantation activity and has locked landowners into a dependency relationship with plantation companies (ibid.).

Similarly, Obidzinsky et al. (2012) claim that government-driven palm oil plantation expansion in Indonesia has prevented indigenous forest communities from utilizing the forest and threatened their livelihoods. Although in both case studies the farmers and indigenous forest communities remain on their respective land, they have essentially lost the benefits they previously gained from it, as they cannot plant other types of food crop or use it for hunting and gathering activities owing to the destruction caused by plantation activity. Thus, land grabbing for biofuel purposes does not have to mean banishing certain groups of people from their land entirely, but can simply prevent people from using the land to their benefit, with the same effect of disfranchising these communities.

Research also points to a rise in conflict between neighbouring communities and plantation companies. Neville undertook fieldwork in Kenya (2015) and Tanzania (Neville and Daugverne, 2012) utilising interviews and ethnography and found that biofuels policy was generating conflicts between communities and plantation companies as the latter was damaging the environment and failed to provide fair compensation for the former. In other studies, conflict has also been revealed between agro companies and the locals who work as their labourers triggered by harsh working conditions, low wages and the use of under-age workers (Wilkinson and Herrera, 2011; Hunsberger et al., 2017). Thus, instead of increasing rural people's welfare, biofuel policy implementation has become the source of conflict between locals and biofuel companies, impoverishing their livelihoods and making the idea of biofuel policy development for rural people's benefit highly contestable.

Conflict around biofuels has been shown to not only occur between agro companies and locals directly involved in or displaced by plantations, but also between communities around plantation areas due to the uneven distribution of benefits and costs as a consequence of a plantation's existence. Obidzinsky et al.'s (2012) ethnographic research in Indonesia has found that agro companies prefer to pay more for skilled labourers and less for those who are unskilled. The skilled labourers are essentially migrant workers who moved to the area with previous experience of working in large plantations. Meanwhile, the plantation activity has damaged the indigenous people's environment and deprived them of their existing livelihood. They have lost their means to fulfil rudimentary needs which has forced them to live either as underpaid workers on the plantation or become marginalized in the community amongst the well-off migrants (ibid.). The disproportionate distribution of benefits between these two communities on agro companies' plantations has also, in some cases, escalated into physical conflict with human casualties (Peluzo, 2008). Such an occurrence is not unique to a case study in one country, as Daugverne and Neville (2010) have reported similar patterns elsewhere in other developing countries that are promoting biofuel industries. This evidence leads to a further disintegration of the claim that biofuel development benefits rural people and can address issues of rural poverty.

Although multiple governments have implemented biofuel policies as a panacea to problems relating to environment and economic development, studies of policy implementation have shown that there are several unwanted consequences. While the research discussed thus far has addressed the implications of biofuels policy in terms of plantation expansion and the consequences for local communities, other studies have been concerned with the nature of the industry that has produced these outcomes. In particular, the emergence of an industrial alliance between biofuel industries and large agro companies has formed a focus for analysis. Some argue that it is this industrial alliance that has caused biofuel policy not only to fail to meet its expectations, but actually escalate the problems that it is intending to solve.

There is ample literature discussing the impact of biofuel policy on environmental and social justice issues (as shown above). I will focus the discussion now on this alliance between agro companies and biofuel industries, commonly known as the agro-fuel alliance drawing primarily on studies grounded in agrarian political economy and political ecology (e.g. Fernanders et al., 2010; White and Dasgupta, 2011). This alliance has been examined for its potential in explaining the political construction of the biofuel energy system and the power relations between stakeholders involved in this system. In the next section, I will discuss the relevant concepts arising from political ecology to enhance understanding of this alliance, before moving to address agrarian political economy. These two areas of theory and research provide a grounding for my research and subsequent analysis.

2.2. Political Ecology: The Politics of Market Creation and the Corporate Interest in Capitalizing on Government Policy

Political ecology offers a critical lens of analysis for examining the interplay of politics and power in the changing social and physical environment (Blaikie, 1985; Blaikie and Brookfield, 1987). Research working with this perspective examines the power relations between actors concerning politics, economy and environment with respect to the social structure and culture of the people in the respective region (Blaikie and Brookfield 1987b:17 as found in Bryant, 1992; Bryant and Bailey, 1997; Rocheleau, 2008). Political ecologists such as Bryant and Bailey (1997) and Robbins (2012) argue that the central idea of political ecology is the changing of environment either negatively or positively as a result of political processes, where the costs and benefits of this change are shared unequally among the actors involved. Thus, political ecologists study the power interplay of politics that leaves ecological impacts, as well as affecting those who depend on it for their livelihoods and wellbeing.

This body of literature has been widely used in many disciplinary areas examining human-environment relationships since it was first developed in the 1970s (Robbins, 2012), as well as being applied to a wide range of global issues, such as the geopolitics of food (Wainwright and Mercer, 2010), food production sustainability (Emel and Neo, 2010; Guthman, 2010), the politics of eco-certification (Eden, 2010), land management politics (Boras Jr et al., 2010) and the politics of agricultural practices (Ariza-Montobbio et al., 2010). This makes political ecology a highly relevant lens of analysis to examine the politics of the biofuel energy system. It offers a set of concepts and ideas that are particularly relevant for the analysis in this thesis.

Firstly, political ecology studies have provided insights relevant to understanding the way market creation from new policy implementation has given power to certain actors to influence and capitalize on the newly created market. For instance, Heidi Bachram's (2004) study of carbon offset projects such as the Clean Development Mechanism (CDM) shows the way policy implementation creates a new market that certain actors can capitalize on and to an extent control, while others cannot. The CDM is designed to facilitate carbon offsetting in developed countries by undertaking activities to assist clean development in developing countries (e.g. planting trees or investing in clean energy projects). This creates a business opportunity for certain private stakeholders to sell carbon credits for clean development activities undertaken in developing countries. This gives power to private stakeholders to decide, for example, what kind of activity they develop and how they implement it. Such decisions are, in turn, dependent on the market demand for carbon credits (Bachram, 2004; Gerber, 2011). This idea concerning how certain actors can capitalize on new market creation arising from policy implementation is highly relevant in analysing the agro-fuel alliance within the biofuel energy system. This is due to the reality that biofuel policy implementation has created a new market exclusively for biofuels (as explained in the above section).

A key argument developed by some political ecologists, such as Bryant and Bailey (1997), is that that government policies often tend to be favourable to certain actors, such as large corporations, as they have access to influence the decision makers. An example of this can be found in Stonich and Vandergeest's (2001) research on the Honduras government's policy to develop aqua culture farming - the main economic activity for people living in the country's coastal regions. They revealed that the policy has created a lucrative business opportunity for large investors with the Honduran government eventually acting more like a corporate partner by providing support such as cultivated area availability and security measures. Other studies examining how government policy favours large corporations include analysis of the Laos energy transition policy (Baird and Quastel; 2015; Smits, 2015), the water privatization policy in England (Bakker, 2000), the Tanzania eco-tourism policy (2001) and the jungle nationalization policy in South East Asia (Peluso and Vandergeest, 2010).

While these studies offer multiple case examples of how large corporations gain favour from government policies, they do not provide sufficient justification for a wider generalisation regarding how the policies operate. Sovacool (2010) argues that there are many examples where governments are genuinely attempting to implement policy to increase people's welfare through the utilization of natural resources. Although his study only uses macroeconomic indicators from the respective countries as the data source, he shows that the government may have a more complex role than merely operating in favour on large corporations.

The second key line of conceptual development within political ecology that is relevant to this thesis is the analysis of politics and power relations within resource markets. A key example of this can be found in Eden's (2011) study of eco-certification. She found that labelling a product with a 'green' label increased the market share of the respective product as consumers have grown aware of the importance of environmental preservation. This makes 'green' labelling a resource product created from consumer power by demanding goods that do not harm the environment in their production. This new resource product (i.e. green labelling) is, in turn, translated into a new market opportunity for certain actors by establishing an institution to issue such labels. Van dam et al. (2008) highlights how the goods producers along with some NGOs and international organizations have representatives in the institution that issue such 'green' labels. This creates a power dynamic between companies that produce the goods and the institutions that issue labels to influence consumers in their choice to buy the respective goods.

The concept of power relations does not only exist within the resource market but also between private stakeholders and state actors. This is vividly seen in Baird and Quastel's (2015) research as they examine the growing demand for electricity in Thailand as a market opportunity to be capitalized on by the neighbouring country of Laos. For a landlocked country with a lack of natural resources such as Laos, a proposal by large corporations to build a huge hydro-energy dam was viewed as an important development solution. The importance of the dam for Laos created an imbalance in the power relations between corporate and state actors as there was pressure for the Laos government to ensure the dam was built in their territory. This imbalance made the government fully cooperative with the investors' requests, including relocating entire communities as well as using coercive techniques to ensure the respective communities consented to their land being flooded by the new dam reservoir (Lawrence, 2009). This concept of power dynamics and uneven power relations is relevant and important to understanding the politics of biofuels. Political ecology, in this respect, offers a suite of concepts for thinking about the creation of markets, as well as vested interests between large industries and governments.

Although these case studies (e.g. Stonich and Vandergeest, 2001; Neuman; 2001; Baird and Quastel, 2015) are generally more focused on social justice and environmental impacts linked to government policy implementation, they also provide insight into the politics of market creation and how such processes can be capitalized on by particular actors creating power imbalances between the stakeholders involved. These key concepts from political ecology will be utilised in the thesis to inform the analysis and provide a way in to understanding how private actors perceive biofuel policy and capitalize on it. However, I argue that insights and concepts from political ecology are insufficient to understand the dynamic metabolism of the biofuel complex, particularly the involvement of large agro companies within this energy system. In the next section, I introduce the lens of agrarian political economy and assert that the insights and concepts from this theoretical lens are needed to be able to fully explain the processes of biofuel development in Indonesia.

2.3. Agrarian Political Economy: The Politics between Government, Farmers and Agro-Industry

Agrarian political economy (APE) is argued by its advocates, such as Henry Bernstein (2010), to be the study of "the social relations and dynamics of production and reproduction, property and power in agrarian formations and their processes of change, both historical and contemporary" (p.1). He later refined his characterisation of APE defining it as studies focused on the agrarian transition to capitalism especially in developed countries and the way colonialism in the late 19th and the beginning of the 20th century has influenced developing countries' agrarian policy (Bernstein, 2016). Thus, studies of APE have a historical focus on agrarian policy transformations relating to the change in the sector from one which was controlled by rural farmers to one that through processes of industrialization came to be controlled by large capital and foreign investment. The relevance and importance of APE as a lens of analysis for biofuel policy studies is because agrarian political economists have studied agro-fuel alliances by examining the power relations between large agro industries and stakeholders involved in the implementation of biofuel policies (e.g. Fernandes et al., 2010; White and Dasgupta; 2011; Daugverne and Neville, 2010; Hollander, 2011; Pye, 2011; Gillon, 2010). Moreover, their focus on this alliance is not only because biofuel industries are using agricultural products as their raw materials, but also because government politics in the agricultural sector may influence biofuel policy. The intention for this thesis is not to use the lens of APE to simply analyse the agrarian politics of biofuels. Instead, it will be used in a similar way to political ecology to identify key concepts within the literature that are useful in analysing the agro-fuel alliance within the biofuel energy system.

One of the common approaches that agrarian political economists have taken in analysing agrarian politics is to examine historical events that have had influence on different countries' agricultural sectors, in order to assess current government policy (e.g. Krueger, 1996; Rozelle and Swinnen, 2009; Mehl, 2009; Rao, 2009; Pechlaner, 2010). Bernstein (2010) argues that the historical facet of a country's agrarian policy is important to analyse as it enhances understanding of the problems that the government wants to overcome and how these problems have created winners and losers between different actors involved in the sector prior to the policy implementation. For example, Rozelle and Swinnen (2009) study agrarian reform policy in China and the Soviet Union in the late 1970s, when farmers in both countries received equal benefit from the government regardless of their yield performance. They highlight how this caused problems of low agricultural output in both countries but with very different outcomes in the two cases. Where China's policy successfully led the country to overcome rural poverty, the Soviet Union's policy ultimately failed and led to the dissolution of the country. Although low agricultural output had been a problem for both governments, farmers in the two countries perceived this in different ways. Farmers in China considered the government problem as their problem due to the famine that struck them prior to the reforms, whereas the Soviet Union farmers had lived contently with the pre-reform system and were against the reform. In this way, the lens of agrarian political economy is able to examine the way the antecedents to policy reform create different actor perceptions and conditions that help to explain the success or failure of a policy.

Although historical analysis is important to understand the past agrarian policies for countries that implement biofuel policies, there are also the concepts of ‘appropriation’ and ‘substitution’ developed by agrarian political economists such as Goodman et al. (1987) which are highly relevant in examining biofuel policy. They developed these concepts as part of an analytical framework for interpreting agricultural industrialization implemented in developed countries, such as the US and the UK. According to Goodman et al. (1987), ‘appropriation’ means that farmers who are independent and able to produce any crops they choose become part of agro-industrialization and their output becomes an industrial input, which inevitably makes them dependent on the large agro-industry. Meanwhile, ‘substitution’ refers to the repurposing of agricultural outputs, which used to be directly consumed as food, to become industrial input where the food is processed into goods with different value than just food - such as biofuel. Based on these concepts, agrarian political economists such as Friedmann (1995) and Gillon (2016) argue that agricultural products have been revalued not merely as food to feed the people but also as derivative products with higher added value such as biofuel.

Besides the concepts that have been discussed thus far, APE also offers a basis for understanding the power relations between farmers, industries and state actors in the agricultural sector. Agricultural economists such as Johan Swinnen (2010) argue that rapid economic development is actually incentivising politicization in the agricultural sector. This is happening as the relations between farmers and politicians have created a political symbiosis whereby the farmers and politicians need each other but with different motivations. The latter supports the former in order to gain political power while the former expects the latter to pass favourable economic policies for them when they hold office. Thus, Swinnen (2010) claims that farmers are the subjects of politicization as they comprise large groups in society, making them significant voters for politicians during election campaigns.

As the agricultural sector is industrialized, government political interests shift from farmers as part of agricultural labour force to the whole agricultural sector as part of the country's economy (Goodman et al., 1987). This shift of interest happened due to farmers increasing wealth, suggesting that industrialization of the agricultural sector may actually benefit them as they are no longer positioned merely as political commodities by certain government elites. However, Swinnen (2010) asserts that in the industrialized agricultural countries, farmers still seek government support especially when the economic situation is unfavourable towards them such as when there is a decrease in agricultural market price. Similarly, governments are likely to focus on the agricultural sector if it loses its competitive advantage which could harm farmers' welfare. This suggests that politicization in the agricultural sector, where farmers are the political commodity, is still happening despite being wealthy from industrialization.

Despite receiving benefits from the processes of agricultural industrialization, Goodman et al. (1987) suggest that farmers' economic share at national scale in developed countries (i.e. in terms of economic output such as gross domestic product - GDP) is actually decreasing due to the decrease in employment within the sector. They highlighted the effect of automatization and mechanization which caused employment in the agricultural sector to shift towards other economic sectors and reduce the number of rural farmers. This could also mean that agro industrialization is benefiting farmers who are land owners as a reduction in agricultural employment means that landless farmers have shifted into other sectors. Thus, agricultural industrialization has increased the production of land-owner farmers and made them wealthier despite the overall economic share of the agricultural sector in that respective country being reduced (Bernstein, 2010).

Nonetheless, Swinnen's (2010) study suggests that agricultural industrialization has ultimately benefited large agro industries as they include farmers' outputs as part of their wider industrial chain. This gives them more economic benefit and eventually increases their economic share at national level. This increase in economic share also increases large agro-industries influence on national macro-economic performance and creates vested interests within the government to support large agro companies, rather than individual farmers in the agricultural sector. Thus, in the industrialized agricultural countries, large agro industries tend to have stronger political bargaining power than farmers as they have a bigger economic share at national level.

These key concepts and insights from agrarian political economy are combined with those from political ecology in order to develop the analysis in this thesis. In the next section, I put forward a framework for my analysis using the concepts I have introduced thus far before going on to discuss the relevant literature specifically examining biofuels and agro-fuel alliances.

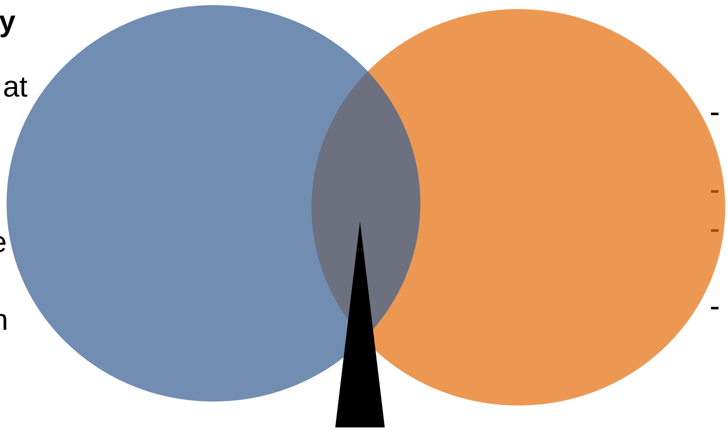
2.4. Reframing Agro-Fuel Alliances within Political Ecology and Agrarian Political Economy

Based on the review of the political ecology and agrarian political economy literature, political ecology tends to focus on the power relations between actors across different scales and the way they influence government politics. By contrast, APE focuses on the dynamics of agricultural outputs and the power relations within and arising from agrarian transformations. Both lines of scholarship share the common concepts of power relations and the interplay of politics and markets, which are useful in analysing the agro-fuel alliance within the biofuel energy system. Picture 2.1 summarizes the key concepts of interest here as well as showing the intersections across both bodies of literature that are relevant to the current study on biofuels and agro-fuel alliances. There are two main themes relating to the politics of biofuels that will be discussed in this section; these are the power of large industries and the relationship between such industries and state actors. This section will examine these particular themes as a focus for analysis of the agro-fuel alliance within the biofuel energy system

Picture 2.1
The Intersect between Political Ecology and Agrarian Political Economy in Dissecting the Agro-Fuel Alliance

Political Ecology

- Impact of policy at micro level
- Multi-level governance
- Disproportionate benefit
- Conflict between actors



Agrarian Political Economy

- Agrarian transformation
- Colonialism impact
- Agricultural production
- Farmers as political commodities

Politics in Biofuel

- **History of agrarian reform**
- **Market politics**
- **Power of large capital**
- **State - large industry relation**

Source: Author Produced

2.4.1. Power of Large Agro Industries in the Biofuels Energy System

Multiple studies using different lenses of political ecology and agrarian political economy have shown the way large agro companies have successfully capitalized on biofuel policy (e.g. Hollander, 2011; Lima et al., 2011; Wilkinson and Herrera, 2011; Pye, 2011; Varkkey, 2012; Pichler, 2015). For example, Wilkinson and Herrera's (2011) study found that sugar industries in Brazil were consolidating their business at a time when demand for bioethanol as a substitute for gasoline was increasing rapidly in the early 2000s. Similarly, Pye (2011) found that palm oil companies in Indonesia increased their production markedly to fulfil demand from biodiesel industries in overseas markets, particularly the EU and US markets. Gillon's (2010) study has also uncovered a similar situation in Brazil, with US corn agro industries consolidating to fill domestic demand for biofuel. These studies all suggest that agro industries were active in ensuring they took advantage of the increasing demand for biofuel either domestically or overseas. These actions contributed to ensuring a close mutual relationship between large agro industries and the biofuel sector.

This creates questions concerning precisely how agro-fuel alliances formed and the implications for power relations between stakeholders within the biofuel energy system. Oliviera et al. (2017) argue that fulfilling market demand for biofuel is seen as a profitable endeavour for agro industries. Moreover, Holt-Gimenez and Shattuck (2009) also assert that biofuel policy implementation is attracting private agro industries to expand in the sector. Studies on biofuel policy implementation conducted in Brazil (Wilkinson and Hererra, 2011) and the US (Gillon, 2010, 2016) confirmed that biofuel policy implementation in both countries has caused the well-established sugarcane and corn industries (in the respective countries) to profit from the policy by either being the biofuel industries main supplier or directly investing in the industry. Their research has shown the way an agro-fuel alliance formed at the onset of the implementation of the biofuel policy in the respective countries. Moreover, they have also shown that biofuel policy implementation in both Brazil and the US has intuitively created a market expansion opportunity for well-established agro-industries, such as sugar (in Brazil) and corn (in the US). These studies suggest the tendency for agro-fuel alliances to be formed as a mutually profitable relationship between large agro industries and biofuel industries.

Such alliances have not been without critique, with analysts such as Mol (2010) asserting that biofuel production should not only benefit large agro industries, but also small scale agro industries, which include economically poor communities involved in the production of biofuels such as subsistence farmers and rural small-scale plantations and refineries. Other proponents of biofuels (e.g. Kuemmel et al., 1998; Huber, 2008; Silitonga et al., 2011) have asserted the benefits of planting biofuel feedstock crops for rural farmers as long as they are not supplanting edible crops and/or are planted as side crops so as not to create issues of food security.

Such research implies that agro-fuel alliances have a potential to share the economic profit from biofuel policies with small rural scale agro industries. As such, some agricultural political economists and political ecologists (e.g. Ariza-Montobbio et al., 2010; Kumar et al., 2015; Afiff, 2014; Fatimah, 2015) highlight how developing countries such as India and Indonesia are trying to develop their biofuel industries by relying on small scale rural agro industries to feed the biofuel industries with the intention of sharing the benefit of this innovation and resolving issues of rural poverty. Furthermore, they also argue that these developing countries are encouraging their rural communities to establish plantations by utilizing non-edible crops such as jatropha and castor where these crops are planted with the sole purpose of being feedstock for biofuel industries.

Studies on biofuel policy in some developing countries such as India and Tanzania have suggested that small scale agro industries that plant biofuel feedstock crops could profit from biofuel policy implementation. Kumar et al.'s (2015) research on India's biofuel policy provides evidence that rural small scale agro industries can be successfully developed with the sole purpose of feeding the biofuel industry. Moreover, Eijck and Romijn's (2006) study of Tanzania's biofuel policy suggests that implementation of the policy can become a profit opportunity for rural scale agro industries.

However, Amir et al.'s (2008) and Fatimah's (2014) research on Indonesia's biofuel policy shows evidence that domestic biofuel companies refuse to buy jatropha produced by rural small scale agro industries for their biofuel input material despite government support for utilizing such crops. Varkkey's (2012) study provides further support for this finding as she found that Indonesia's biofuel manufacturers preferred to be supplied by well-established palm oil companies. Demand for crude palm oil (CPO) kept increasing even after the implementation of the biofuel policy suggesting a continuing reliance on CPO to meet demand from biofuel industries, both domestically and overseas. Although Eijk and Romijin's (2006) study suggested that biofuel policy could create a profit opportunity for small scale agro industries, the jatropha case in Indonesia has shown that agro-fuel alliances do not necessarily arise for small scale rural agro industries that produce biofuel feedstock crops. Thus, there are likely other factors at play in driving agro-fuel alliances still to be determined.

Biofuel studies that examine the use of non-edible crops as biofuel feedstock have suggested that not all agro industries can supply biofuel companies despite the crops being planted specifically for them (e.g. Ariza-Montobbio et al., 2010; Afiff, 2014). Previous studies on Indonesian biofuel policies show that biofuel companies are reluctant to use jatropha as their feedstock because it is too expensive as an input material (Amir et al., 2008; Fatimah, 2015). In contrast, Afiff (2014) argues that crude palm oil (CPO) is potentially a cheaper input material for the biofuel industry due to its low price.

According to Hamilton-Hart’s (2015) study, palm oil industries in the South East Asian region are large companies with plantation bases in Indonesia and Malaysia, marking the region as a global supplier of palm oil. In contrast, jatropha plantations were just newly establish on a small scale in Indonesia (Afiff, 2014). Similarly, Wilkinson and Herrera’s (2011) study has reported that large soybean agro industries in Brazil are starting to control the domestic biodiesel market, despite the government’s attempts in directing biodiesel companies to use castor oil planted by small scale farmers. Based on the studies of biofuel feedstock crops in Indonesia and Brazil, it may be said that that well-established large scale agro companies tend to have a competitive advantage over rural scale plantations dedicated to supplying biofuel companies.

The Indian biofuel policy provides evidence that *only* large capital plantations *can* feed the biofuel industries. Kumar et al. (2015) assert that large agro industries, such as corn in the US and sugarcane in Brazil, did not exist on the same scale prior to biofuel policy implementation in the respective country. This suggests that any agro industries producing biofuel feedstock crops should have the same opportunity in terms of benefitting from biofuel companies. Nevertheless, Ariza-Montobbio et al.’s

(2010) research has shown a similar pattern with Indonesia where large capital plantations have advantages over small-scale rural plantations. Their research found that biofuel companies only wanted to be supplied by jatropha plantations with strong capital since only these plantations could supply the industries with the amounts they needed at affordable prices. Thus, Ariza-Montobbio et al.'s (2010) study confirmed that a well-established agro-industry is not the primary factor that makes agro-industry able to capitalize on government biofuel policy. Instead, it is the amount of capital that agro plantations have that becomes the primary factor encouraging the biofuel industry to bond with agro plantations. To be more precise, it is large capital agro-industry that can capitalize and benefit from biofuel policy implementation, not small scale industry.

These previous research studies suggest that large agro industries are likely to have advantages within the market that enable them to more easily profit from biofuel policy implementation, even where attempts are made to support small-scale suppliers. The studies from Indonesia and Brazil have shown that an agro-fuel alliance is only emerging with well-established agro industries that have significant capital. Moreover, analysis of the Indian government's biofuel policy shows that even in the absence of *well-established* agro industries prior to policy implementation, the agro-fuel alliance only forms between biofuel industries and *large* agro-industries. This is suggestive of the power of large capital within the biofuel energy system and the limits of government policy in this market.

Most of the studies on biofuels discussing the power of large capital in the biofuel energy system are focused on large agro industries and their advantages within the biofuel policy/industry complex. Within these studies, the large agro companies seem to possess all the power and the role of the biofuel companies is neglected, with agro-fuel alliances appearing as seemingly inevitable. Nevertheless, as confirmed through biofuel studies in developing countries such as India and Indonesia, biofuel industries appear to be established independently from large agro companies. This suggests that the agro-fuel alliances that form are not happening inevitably but through political processes, involving multiple actors, including government, biofuel industries and the agricultural sector. Thus, it is important to discuss all of these entities and their roles within the biofuel energy system to provide an understanding of the politics of biofuels.

2.4.2. The Role of Governmental Interests in Constituting the Agro-Fuel Alliance

The previous subsection has discussed the power of the large capital agro industries and the research that highlights their role in creating an agro-fuel alliance in biofuel markets. However, the studies on biofuel politics that have been discussed previously (e.g. Amir et al., 2008; Ariza-Montobbio et al., 2010; Mol, 2007; Oliviera et al., 2017) also suggest that there is a tendency for state actors, notably the central government authority in a country, to support large industries, giving these actors a notable role in creating agro-fuel alliances. This subsection will discuss research that attempts to explain how and why governments have an interest in supporting large industries in ways which contribute to the emergence of agro-fuel alliances in biofuel markets.

Based on the discussion earlier in the chapter, several large industries involving edible crops are associated with the biofuel energy system, with a few non-edible crops, such as jatropha and castor, also involved. However, this thesis will only focus its analysis on agro industries associated with edible crops rather than non-edible crops, since research on biofuel policy case studies using non-edible crops (e.g.

Amir et al., 2008; Wilkinson and Herrera, 2011; Afiff, 2014; Fatimah, 2015) has suggested that their dynamic as biofuel feedstock is limited by the existence of well-established edible crop agro industries. Thus, examining agro-fuel relations within edible crop industries is likely to be more productive as well as relevant within this research because biofuel industries in many countries, including Indonesia as the subject of this research, are mainly using such crops as their feedstock.

There are two key aspects relating to governmental policies in the agricultural sector that biofuel industries need to thrive. The first, and the most important, aspect that biofuel companies need is the specific material products required to feed their particular biofuel industry. Mol (2010) explains that there are two types of biofuel widely for sale within the biofuel market - biodiesel and bioethanol. These types of biofuel are made from different crops; biodiesel is made from oilseed crops (such as palm oil, soy bean, jatropha and rapeseed), while bioethanol is made from sugar content crops such as sugarcane and corn (Kumar et al., 2015). Mol (2010) further highlights how biofuel production has a tendency to follow the types of fuel mostly used in any given country. For instance, as gasoline is widely used in both the US and Brazil, their biofuel industries focus on production of bioethanol, while EU countries, such as France and Germany, tend to focus on biodiesel production since gasoline is less commonly used than diesel. This suggests that biofuel industries in the respective countries would need particular feedstocks supplied by agro industries in accordance with their specific fuel market demands.

This leads to the second aspect that biofuel industries require, which is the *availability* and *reliability* of the appropriate feedstock material. Biofuel industries rely on raw materials from crops such as sugarcane, corn, soybean, palm oil and rapeseed but these crops are also used for a number of other purposes including for human food products and animal feed (Bailis and Baka, 2011). Mol (2007) argues that the use of food crops for biofuel industry purposes is, partly, due to these crops already being available and abundantly produced before the growing interest in biofuels emerged. Mol's later (2010) research confirmed that biofuel industries in multiple countries tend to rely mainly on one type of food crop for their feedstock. For example, in the US corn is dominant and in Brazil sugarcane is the primary feedstock to produce bioethanol, while in Germany and Malaysia rapeseed and palm oil respectively are relied on to produce biodiesel (ibid.).

Agrarian political economists and political ecologists such as Daugverne and Neville (2010) highlight how large agro industries producing crops that can be used to feed biofuel industries, had already established their presence a long time before the governments in the respective countries implemented their biofuel policies. Such research confirms Mol's arguments regarding the tendencies for biofuel industries to focus on crops that are already well established and widely available for their feedstocks, rather than using feedstocks specifically grown for biofuels. This is suggestive of the advantages that these large agro industries possessed when biofuel policies were introduced and of the connections to historical agrarian policies.

Agrarian political economists (e.g. Goodman et al., 1987; Krueger, 1995; Swinnen, 2010; Bernstein; 2010) have shown that agrarian reform, particularly in developed countries, has made the agricultural sector in general become heavily industrialized. Moreover, the industrialization of this sector not only happened in developed countries but also in developing countries, such as within the palm oil industries in Malaysia and Indonesia (Hamilton-Hart, 2015) and the sugarcane industries in Brazil (Wilkinson and Hererra, 2011).

Krueger (1995) argues that agricultural industrialization is often perceived as necessary by governments to increase a country's economic growth creating political interests in supporting such transformations. Her argument is supported by Swinnen's (2010) study which focuses on the ways governments have initiated policies designed to support agricultural industrialisation, for example, by providing subsidies. Government policy encouraging industrialization in the agricultural sector has in some cases led to increased economic growth for the country and beneficial outcomes for the respective government.

However, industrialization of the agricultural sector in both developed and developing countries has also seen negative impacts related to the rise of agro corporatism, particularly at the second half of the 20th century. For example, Friedman (1993) highlights some of the negative implications of the US government's policies on global food production in the post-World War II period. The US government attempted to strengthen its hegemony over other countries through the export of affordable food, creating opportunities for US agro companies to expand and profit. Friedmann (1993) argues that this policy saw US farmers become appropriated and subsumed within the structure of large agro industries in order to support increasingly high demand for food. This is what Goodman et al. (1987) argue can be seen as appropriation and substitution, where farmers are co-opted into positions that require them to buy machinery and fertilizers from large agro companies and sell their output to the companies, which the companies then process and sell overseas. As a result, agro industrialization in the US has caused food production to increase rapidly and cheaply, benefitting the government and consolidating the US's position as a global food supplier but with negative consequences for others involved in agricultural production.

For example, Friedmann (1993) argues that these processes of agricultural development have created dependencies in some developing countries on food or agricultural supplies from the US. Krueger (1995) further highlights how increases in the supply of food have caused these commodities to become very cheap in the commodity market reducing farmers' incomes in both developed and developing countries. Farmers in developing countries are unable to compete against cheap imported food that floods their domestic markets, while farmers in developed countries suffer a decrease in their income since they cannot increase the price of the food commodity they produce due to their appropriation by large agro companies and subsequent loss of control over setting prices for their outputs (Goodman et al., 1987).

Another negative consequence for agro industrialization, particularly in developing contries, would be a social justice problem on the marginalization of native farmers. For example, the Indonesian government policy to reclassify 90% of the country's forested area as state forest since late 1960's has deprived the indigineous farmers livelihoods, since the government forbid them to conduct their traditional slash and burn agriculture as it is considered as environmentally destructive (Nomura, 2009). The forest reclassification policy means that the government has an authority to convert forest to developed logging and agriculture industry, whilst alienating the natives from their ancestral land in this process. However, the economic benefit from the forest conversion was largely received by migrant citizens, Indonesian people whom participated in the government resettlement program, which made them wealthy, particularly those working in the plantation or receiving the government land to estabilished smallholding (Nomura, 2009; Obidzinsky et al. 2012). This condition has further disfrenchased native farmers, which often becomes the catalyst of horizontal conflict between the two communities (Peluzo, 2008). The negative impact of agro industrialization has not only occurred in Indonesia, but also in other developing countries such as India (Arizo-Montobbio et al. 2010) and Brazil (Fernandez et al. 2010), where large plantation existence has further marginalized poor native farmers living in the plantation areas.

Despite these problems created, in part, through government support for agricultural industrialization and the development of large agro industries, Swinnen's (2010) research suggests that farmers continue to have a significant political position that cannot being ignored by governments. Thus, there remains a need for governments around the world to attempt to address problems created in this sector. The rise in demand for biofuels was for many governments viewed, then, as having potential to revive farming sectors and address rising rural poverty.

However, ultimately, as discussed above, the development of biofuels has in reality tended to benefit large existing agro industries (Oliviera et al., 2017). Precisely because of agricultural industrialisation and the appropriation of farming sectors by large agro companies, farmers have little direct bargaining power with biofuel industries. Instead, they sell their outputs to large agro companies, which hold the power to negotiate prices and generate profit (Goodman et al., 1987). Even though studies show that farmers do gain some benefits from biofuel production and related policies (e.g. Gilon, 2010, 2016; Wilkinson and Herrera, 2011; Castellanos-Navarrete and Jansen, 2015; Holt-Gimenez and Shattuck, 2009; Varkkey, 2012), the vast majority of benefits continue to be retained by the large agro companies. The history of global agricultural industrialization and the role of governments in promoting this is important, then, in understanding the power dynamics within the contemporary biofuel complex and the challenges of more recent policies designed to address rural poverty and benefit farmers directly.

2.5. Concluding Thought

Based on the discussion in this literature review chapter, it can be concluded that there is a strong connection between the large agro and biofuel industries. Large agro companies have the advantage of producing large amounts of the feedstock material needed by the biofuel industries, which has enabled them to capitalize on biofuel policy. Furthermore, the literature also suggests that historical alliances between government policy and large agro industries has been influential in the development of biofuel markets and production processes.

Although previous studies (e.g. Wilkinson and Herrera, 2011; Oliviera et al., 2017; Gillon, 2010, 2016) have discussed the role of the government in causing the creation of agro-fuel alliances, most of these studies have set their focus on the way *agro companies* have been able to take advantage of biofuel policies and identified this as the key factor in the creation of agro-fuel alliances. Conversely, there is insufficient debate on the politics behind the *biofuel industries* and their role in the establishment of the agro-fuel alliance. This is because most of the studies focusing on this area consider biofuel industries either as part of large agro companies or as dependents of these companies (i.e. feedstock suppliers), undermining the possibility of there being politics behind biofuel industrialization. A key contribution of this thesis is to address this gap in the literature and examine the other side of the agro-fuel alliance by looking at biofuel industries and their relationship with agro industries.

Although there are two types of biofuel sold in the market (Mol, 2010), the discussion of biofuel policy via country case studies has mostly focused on one type of biofuel either bioethanol or biodiesel (e.g. Fernandes et al., 2010; Holander, 2011; Pye, 2011; Gillon, 2016), with a few exceptions such as Wilkinson and Herrera (2011) and Kumar et al (2015). Even within these exceptions, Kumar et al.'s (2015) study of India's biofuel policy focused on the social justice impacts for rural people and particularly rural food security issues. Meanwhile, Wilkinson and Herrera's (2011) study provided a comprehensive discussion on the power of large agro industries within Brazil's bioethanol policy, with some insight on the politics of crops for its biodiesel policy. Yet, this study is still focused on the power of large agro industries over biofuel policies and the impacts on the livelihoods of the small farmers, while the political dynamics of biofuel companies in Brazil are insufficiently addressed.

The existence of biodiesel and bioethanol in the biofuel market and the requirements for two different types of crops to produce them indicates a different method and industrial characteristic between them that could potentially be politicized by certain actors involved in the biofuel complex. However, little attention has been given to study of the politics of crops used for producing these different forms of biofuel (i.e. bioethanol and biodiesel) other than revealing the profound effects on the livelihoods of certain communities affected by the existence of plantations. Indeed, Oliviera et al. (2017) highlight the need for further biofuel policy studies that focus on the political economy of crops in relation to biofuel production. This is a further important gap in the current literature that will be addressed through this thesis.

With these two key knowledge gaps identified, I argue that the Indonesian biofuel case study provides an opportunity to generate insights that can address them. Research on Indonesia, in particular, has this far focused predominantly on the impact of biofuel policies on rural or indigenous peoples' livelihoods (e.g. Obidzinsky et al., 2012; Fatimah, 2015; Amir et al., 2008; Pichler, 2015). The small amount of research that there is addressing questions relevant to understanding the politics of crops that could be used to produce bioethanol and biodiesel is focused on jatropha (e.g. Afiff, 2014; Fatimah, 2015), and does not address processes of biofuel industrialization or underlying politics. The research and analysis in this thesis will bring an alternative focus on the politics of crops more broadly beyond jatropha, particularly looking at the importance of palm oil and sugar cane in the Indonesian context - and the politics of the biofuel industries as a neglected element of the agro-fuel alliance.

Chapter Three

Methods and Methodology:

Designing the Research for the Indonesian Biofuel Case Study

This chapter explains the methodology, data, and analytic approach used in completing the research. The research aims to conduct an in-depth study of the political construction of biofuel policy in Indonesia, examining how underlying politics shaped and reshaped its trajectory. It uses a qualitative approach as a means to better understand the way that the policy has been enacted, contested, and reconfigured in practice. The following methods were applied: document analysis; semi-structured interviews with stakeholders, including government officials in different tiers (central, provincial and municipal/district), industry representatives and NGOs/academics; and a field study drawing on the researcher's first-hand experiences working within Indonesia's policy environment.

This chapter is comprised of six sections followed by a conclusion. The first section discusses the research location to provide a geographical perspective of the area visited for conducting interviews with the respondents as well as for field study observations. The second section focuses on the design and selection of the methodology for the research. The third section discusses the research strategy, including the processes for data collection and also includes discussion about selecting the data sources. The fourth section discusses the interview process as it is the most complicated part in conducting this research; it discusses the problems in gaining access and undertaking interviews as well as the strategies used to overcome this. The fifth section discusses the field study where field observations were conducted to gain more insight into biofuel policy implementation on the ground. The last section discusses the data analysis and the writing stage of the thesis.

3.1. Research Location

In this field research, I went to five different cities in Indonesia namely, Jakarta, Pekan Baru, Dumai, Medan and Yogyakarta (**Picture 3.1**). These cities were selected due to the necessity to reach relevant respondents as well as in an attempt to visit biodiesel factories. The different places chosen posed their own challenges due to the relatively short period for the field research (3 months). However, many of the respondents lived and worked in Jakarta or its surrounding areas, meaning that I spent most of the research period in Jakarta with one week to visit the other four cities to undertake interviews and visit sites for field observations.

Picture 3.1
Map of Indonesia's Provinces

Source: Adopted from www.wikimedia.org which has been personally modified

All the offices of the government ministries are located in Jakarta which was advantageous as more than half of the respondents were central government officials. Besides government officials, many non-government respondents including those identified as R1, R8, R15, R19 and R20 also reside in Jakarta. These respondents represented NGOs and palm oil, biodiesel and fossil fuel companies, and, in total, along with central government officials, composed two thirds of the total respondents in this research.

Key challenges related familiarity with the research setting were less of an issue for this project as Jakarta is my home town, which means that I know the area very well and this reduced the need for a local guide. I was also aware of particular difficulties in navigating the city such as traffic jams, which are notorious in Jakarta, and was able to use such knowledge to inform decisions about research design, including the decision to spend at least two months in the city to complete this aspect of the research. I live in the suburbs while most of the respondents' offices are located in the centre of Jakarta. Moreover, their offices are not located in the same area nor within walking distance of one another. This made conducting more than one interview in one day unfeasible, as I did not know how much time was needed to travel between respondents. Thus, I decided to do one interview per day since it also provided adequate time for me to reflect on the finished interview on the same day that it took place.

3.2. Methodology and Research Design

3.2.1. Selection of Methodology

Researchers have applied both quantitative and qualitative methods when researching the politics of biofuels. Quantitative analyses have been used particularly when the biofuel study is focusing on greenhouse gas emissions being sequestered (Cherubini et al., 2009; Fargione et al., 2008), the effectiveness of a particular crop as biofuel feedstock (Foidl et al., 1996; Achten et al., 2010), and the effectiveness of using a particular crop as biofuel feedstock in relation to storing greenhouse gases (Silitonga et al., 2011). Qualitative analysis has also been used extensively by researchers, particularly to examine the impact of biofuel industrialization on problems concerning the environment and social justice (e.g. Fernandes et al., 2010; Daugverne and Neville, 2010; Arizo-Montobbio et al., 2010). Of most relevance for present purposes, qualitative methods have also been favoured for studies focusing on biofuel policy and politics (e.g. Oliviera et al., 2017; Wilkinson and Herrera, 2011; Holander, 2011).

In the context of Indonesia, both methodological approaches have been used to investigate the biofuel policy issue. However, most of this research is concentrated around the issue of socio-environmental impacts relating to the increase in demand for biofuel feedstocks, such as land use changes, forest fires, endangered wildlife (Tata et al., 2013; Masimin, 2013; Nair, 2015) and major disruption for those living in feedstock areas (Obidzinsky et al., 2012). There are also some Indonesian researchers who have used qualitative methods to evaluate biofuel policy and politics (e.g. Amir et al., 2008; Afiff, 2014; Fatimah, 2015). Thus, although both quantitative and qualitative methods can be applied to questions about biofuel development, a qualitative approach has generally been favoured when focusing on aspects of policy and politics.

The application of qualitative methods to investigate policy and underlying politics is particularly appropriate because the approach offers flexibility to explore emergent themes and areas of interest for the research (Charmaz, 2006). For example, qualitative interview methods enable researchers to ask open questions to extract more detailed information about the situation, instead of just testing a predetermined hypothesis (Carter and Little, 2007). Interview methods are thus particularly useful for exploring the construction of biofuel policy, and giving insight into different actors' understandings, motivations and perspectives (Marquardt, 2017). Thus, it enables the researcher to understand the problem thoroughly and holistically as required for a case study concerning Indonesia's biofuel policy (Farber, 2006).

3.2.2. Research Design

This research was designed as a case study, using Indonesia's biofuel policy as the research subject. Battacherjee (2012) asserts that a case study is useful in contexts where the focus is on the intensive study of certain events. Case studies tend to employ multiple methods and forms of data, ranging from interviews and policy documents, to observations. Using a case study design was useful for this research as it gave flexibility for the researcher to refine the research focus throughout the research period, being attentive to emergent issues and important lines of enquiry relevant to the broader research questions (ibid). This proved particularly important for this research as my focus shifted from to trying to understand the outcome of the policy to looking at the political and policy process that produced the outcomes, whilst applying ideas and insights from political economy.

I began my analysis by looking at the historical context for agricultural policy in Indonesia to understand the extent to which this shaped contemporary biofuel policy. This method is commonly utilised by agrarian political economists whose studies have shown that current agrarian practices are deeply affected by past agrarian policy (Krueger, 1996; Rozelle and Swinnen, 2009; Mehl, 2009; Rao, 2009; Pechlaner, 2010). For this part of the research, I used policy documents related to the agrarian policies for the main crops used in developing Indonesia's biofuel industry, namely sugarcane and palm oil. I combined these secondary sources with other documentary data from media interviews with key stakeholders in biofuel development, government reports and previous research[1] on biofuel policies.

The analysis in the thesis progressed from an examination of the history of agrarian policy onto its effect on the contemporary biofuel industry and market. To investigate the contemporary context, I again used a combination of primary and secondary data, including interviews and policy reports. For this aspect of the research, I also utilised my personal experiences as a government official in Indonesia, which gave me understanding of the inner workings and structure of the Indonesian government and its policy culture. Before conducting this research, I was working in the Ministry of Finance for more than 10 years where my unit was in charge of formulating the central government budget policy. Thus, I have been directly involved in policy making, as well as the political process of creating the government budget. This experience has proven useful to the interpretive work and sharpened the analysis of the political process of biofuel policy making.

Table 3.1
Overview of PhD Research Design

Research questions	Data needs	Data collection method	Data analysis
1. How has the longer-term history of agrarian development and policy in Indonesia shaped modern day biofuel production?	Data on the Indonesian policy related to the development of palm oil and sugar cane. This would comprise policy documents, government reports, media and research interviews, books and previous Indonesian research on palm oil and sugarcane	- Interviews with biofuel and palm oil industry representatives - Internet data search - Literature searches	Abductive analysis

[1] This research mostly consists of articles published in national journals and thus written in the Indonesian language.

	policies.		
2. How has the biofuel industry and its market structure reshaped contemporary Indonesia's biofuel policies?	Data on the production process and methods for creating biofuels. This also segregated the different types of biofuel - bioethanol and biodiesel. Data comprised of policy documents, government reports, media and research interviews, books and previous Indonesian research on palm oil and sugarcane policies.	- In depth interviews with government officials, private companies/plantations and academics/NGOs - Internet data search - Literature searches	Abductive analysis
3. How are politics and political processes enacted by those involved in the biofuel energy nexus in ways that have shaped biofuel policy and practice in particular ways?	Evidence relating to the development of policy and regulations that may or may not be specific to biofuels but have an effect on biofuel policy implementation. This would include existing policy documents, government reports, and media and research interviews.	- In depth interviews with government officials, private companies/plantations and academics/NGO's - Internet data search - Personal experience and operational knowledge - Field observations	Abductive analysis

Source: Author produced

3.3. Research Strategy and Data Collection Method

This section discusses the strategy for conducting the thesis research particularly during the field research stage. An effective strategy was particularly important since I only had three months for the field research because of restrictions relating to the time period allowed by the scholarship sponsor to retrieve data outside the UK. In this section I provide more detail on the different data collection processes for each of the methods utilised. This section focuses especially on two data collection methods – 1) reflection from my personal experience and 2) collection of secondary data sources in the form of government policy documents, reports, media interviews, as well as previous research studies about Indonesia’s agricultural and biofuel policy. The interviews, which form the bulk of the research data, will be discussed in section 3.4 of this chapter.

3.3.1. The Advantage of Personal Experience

In conducting this research, I found that my personal experience offered many advantages, while also presenting challenges relating to my positionality. The utilization of personal experience as part of the research data resonates with Polanyi’s (1962) concept of tacit knowledge where he argues that some forms of knowledge can only be derived from direct experience and practice. Both the tacit and explicit knowledge that I have acquired from immersion in the Indonesian governmental system proved in many senses beneficial, not only during the field research but also through the analysis and writing phases. In my previous occupation, my government unit was in charge of formulating the budget policy for central government. I was in charge of overseeing government revenue policy, which included tax and non-tax revenue. Thus, my position meant I was directly involved in government policy making and as such I am familiar with the political process of policy creation.

Another advantage from my personal experience is the skill to understand policy language. Indonesia’s policy language often includes sentences with implicit meaning - and this is particularly evident in government policy that relates to the disbursement of government funds, such as in subsidy policies. For instance, the word “subsidy” is usually referred to as “incentive” in policy documents. Thus, detailed understanding of what the policy entails is necessary to avoid misinterpretation of the policy language. This poses a significant challenge particularly when translating the policy into English, as I needed to carefully rephrase some words in the policy document to ensure accurate meanings.

The utilization of personal experience also proved helpful in terms of knowing where and how to find relevant policy documents. This is because there are many documents with different functions and issues produced by different government bodies at different levels. Moreover, I was aware that policy documents always have identification numbers; my familiarity with this system made it easier for me to find relevant documents. Thus, with my background knowledge I was able to both identify and find the most important and relevant documents for this research.

However, I found that the greatest advantage of having personal experience as a government official was gaining access to respondents. This is because most of the respondents in this research are government officials. In this context, I was able to use my existing networks to reach the right person to interview. Moreover, in the cases where I did not have anyone to contact, I was able to find the relevant government office address and phone number on their website. I would then phone the number and the phone was usually answered by a secretary of the head of the respective office. I would then start from that point, as will be discussed further in a later section of this chapter.

Although my personal experience was a key strength in conducting this research, I recognised that there could also be an issue of positionality since I am a government employee like most of the respondents. Sultana (2007) asserted that being a native researcher in the field study area could potentially lead to unethical conduct when collecting data, where different power relations with the respondent could cause the researcher to be too forceful or intimidating when collecting information. In Sultana's (2007) case, she conducted interviews in rural areas of Bangladesh where her respondents could regard her as being superior towards them. However, in this research, I interviewed people who hold power and authority such as middle ranking government officials and directors of companies. Thus, despite being a native researcher, it is the respondent that could be intimidating to me if, for example, my interview question is of a critical nature and the respondent does not really want to answer. In this context, the respondent could actually consider me as a nuisance, rather than someone acting in a superior manner. Hence, the respondents in this research could be categorized as elites and thus, I followed Mikecz's (2012) suggestions about conducting interviews with elites, as will be discussed in section 3.4.

However, being a government official working closely with the way policy was formulated for more than a decade meant that it was difficult to detach my own positionality from this research (Cook et al., 2005). This was due to the fact that I knew and personally witnessed the way politics played a role in the formulation of state budget policy. Fortunately, I did not have experience of being directly involved with the politics behind biofuel policy formulation which enable me to use personal experience with reflexivity instead of using it as the basis for analysis (ibid). While this does not remove issues of positionality, it reduces the potential for power differentials to have a negative effect on the research, for example respondents giving answers that they think I want to hear.

3.3.2. Utilization of the Internet for Collecting Secondary Data

This research utilizes policy documents within the analysis. The collection of policy documents could pose difficulties as some documents are more than three decades old. Then, I reflected on my personal experience of previously finding old policy documents on the internet. I know that there is a unit in every government body that has the specific task of uploading policy documents. Moreover, these documents are usually freely available to access on the internet. Thus, I realised that I could use the internet to find relevant policy documents without having to contact specific government bodies.

However, without knowing the kind of policy documents that are relevant, one could easily come to the conclusion that the documents are not available online as they cannot be found. Again, my personal experience has aided me to successfully retrieve data from the internet. I know that every policy document has a respective name which is specific and usually has a lengthy title such as *"Keputusan Menteri Energi Dan Sumber Daya Mineral Nomor : 0219 K/12/Mem/2010 Tentang Harga Indeks Pasar Bahan Bakar Minyak Dan Harga Indeks Pasar Bahan Bakar Nabati (Biofuel) Yang Dicampurkan Kedalam Jenls Bahan Bakar Minyak Tertentu"* which can be translated as "*Decree of the Minister of Energy and Mineral Resources Number: 0219 K / 12 / Mem / 2010 Concerning the Price of the Fossil Fuel Market Index and the Price of the Biofuel Market Index Mixed With Certain Fossil Fuel*". Retrieving this document through the internet requires the intuition of the researcher, as some policy documents particularly the newer ones may not need to be written in full to find them. However, an older document may require that the title is written in full to facilitate access. This suggests that searching for policy documents requires intuition along with knowledge about the types of documents related to the specific subject.

Table 3.2
Timeline of Indonesia's Biofuel Programme and Its Associated Policy

Year	Event or name of the policy implemented	Area being regulated by the policy
1971	Presidential Decree Number 43	Regulating domestic sugar market starting the sugar protection policy
1972	Law Number 3	Start of transmigration policy, providing land to farmers for planting revenue crops such as palm oil, starting the core estate policy
1975	Presidential Instruction Number 9	Directing farmers to plant sugarcane crops, strenghtening the protection policy
1977-onwards	Fossil Fuel Subsidy	Government disburses subsidy for fossil fuel for the first time
1984 - onwards	Allocation of Fossil Fuel Subsidy	Government allocates fossil fuel subsidy within the national budget for the first time
1984	Presidential Instruction Number 1	Strengthening core estate policy, private stakholders and farmers start to dominate palm oil industry
1995	Law Number 11	Regulating ethanol distribution in Indonesia
1997	Economic Crisis	Ending of the sugar protection policy, farmers starting to abandon the sugarcane crop
2005	Presidential Regulation Number 55	Regulating the amount of fuel subsidy based on MOPS and ALPHA
	Minister of Finance Regulation Number 92	Imposition of an export tax for palm oil products
2006	Presidential Regulation Number 5	Start of the biofuel policy initiative
	Presidential Instruction Number 1	President instruction that directs Pertamina to be involved with biofuel policy
	Minister of Energy and Mineral Resources Regulation Number 51	Regulates domestic biofuel market
2007	Law Number 39	Amendment of excise tax policy but no change to the bioethanol regulation
	Minister of Finance Regulation Number 94	Start of the palm oil downstreaming policy
2008	Minister of Energy and Mineral Resources Regulation Number 32	Start of the mandatory blending target policy
	Minister of Finance Regulation Number 9	Biodiesel incorporated into palm oil downstreaming policy
2009	Minister of Finance Regulation Number 156	VAT rebate for biofuel transaction in domestic market in 2009
2010	Minister of Finance Regulation Number 21	Tax and customs incentives for utilization of renewable energy source
	Minister of Energy and Mineral Resources Decree Number 219	Start of the policy providing a subsidy for the biofuel industry which imediately responds by stopping all bioethanol production for fuel purposes
2011	Minister of Finance Regulation Number 130	Corporate tax reduction or exemption incentive
	Government Regulation Number 52	Income tax incentive for investment in certain sector and/or regional area
2015	The End of Biofuel Subsidy Policy	Parliament decided that the biofuel subsidy policy should stop
	Minister of Finance Regulation Number 113	Estabilishment of CPO Supporting Fund Agency
	Minister of Finance Regulation Number 114	Palm oil companies start to fill the CPO supporting fund which will be used to subsidize domestic biodiesel production

Source: Author produced

There are approximately 21 policy documents that I successfully collected from the internet (see **Table 3.2**). Besides policy documents, I also used government reports as secondary data. The term 'government report', in this research context, refers to a document produced by individuals with the purpose of providing a research analysis on behalf of a particular government body, where the rights of publication belong to the respective government body. Unlike policy documents that have legal consequences if not followed, government reports do not have such implications. Although it may not have any legal authority, a government report can contain valuable information relating to national biofuel production levels and biofuel processing methods. Such reports provide vital data components for the thesis.

There are two types of government reports used in the secondary data for this thesis. First, there is the Global Agriculture Information Network (GAIN) Report which is an annual report produced by the US Department of Agriculture. This document records the development of Indonesia's biofuel industry and related policy from 2006 to the present day. Moreover, the primary source for this document is the government notably the Ministry of Energy and Mineral Resources, which ensures the reliability of the data presented in the document. Secondly, I utilized a number of one-off government reports produced by different ministries, including the Ministry of Finance, Ministry of Energy and Mineral Resources, Ministry of Agriculture and Agency of Statistics - and all these documents are also available online (**Table 3.3**).

Table 3.3
List of Government Reports Related to Biofuel Policy

No	Name of the Report	Produced by	Year of the Report
1	Global Agriculture Information Network (GAIN)	United States Department of Agriculture	2006-2017
2	Low Carbon Support Programme	Ministry of Finance	2013 & 2015
3	Bioenergy Investment Guidelines	Ministry of Energy and Mineral Resource	2016
4	Summary of the State Budget 1969-2005	Ministry of Finance	2004
5	Tree Crop Estate Statistics of Indonesia (Palm Oil)	Ministry of Agriculture	2014 & 2016
6	Tree Crop Estate Statistics of Indonesia (Sugarcane)	Ministry of Agriculture	2012
7	Indonesian Sugarcane Statistics	Agency of Statistics	2015
8	Financial Notes and the State Budget	Ministry of Finance	2008-2010
9	Pocket Book Database	Ministry of Finance	2015-2017

Source: Author produced

Another important secondary data source were media interviews and statements given by government officials and industry representatives. The media, such as newspapers and magazines, are usually able to interview top level figures such as the President, Ministers and other important persons. Their quotes provide a source of information that has been used in places to strengthen the analysis in this research. Media interviews are, of course, not without their issues as those being interviews are likely to present a particular version of events and may not express things in the same way as they would within a confidential interview setting. Never-the-less, they can be useful when combined with other sources of data for building up a picture of the salient issues and the positions of different actors.

Lastly, I also incorporated previous research studies on palm oil and sugarcane as secondary data sources. These studies can be categorised into three groupings: technical issues in producing biofuel; evaluation of Indonesian government policy in growing sugarcane and palm oil in the 1970s and 1980s (without any regard to biofuel); and the history of colonialism in Indonesia. Some of these studies cut across these different categorisations (see **Table 3.4**). The type of literature utilised for this are included as secondary data because the information has formed part of my analysis, rather than having relevance to the research topics and aims i.e. they do not address issues of policy and politics relating to biofuels, rather they provide information relevant to answering my research questions, particularly within chapter 4 where historical analysis is the focus. Most of these previous research studies are written in Indonesian, although certain key parts may be written in English such as the abstract. These studies are available in national journals and freely downloadable from the internet. I have put all the source materials in the references within this thesis.

Table 3.4
Previous Research Studies Used as Data in This Research

No.	Reseach Title	Year	Author	Focus
1	Economies of Scale of Sugarcane Cooperatives in East Java Province and TheirIinfluencing Factors	2013	Ariningsih, E.	Second category
2	Sejarah Kelapa Sawit Indonesia	2017	Supriyono, J.	Second category
3	An Economic History of Indonesia	2012	van Zanden et al.	Third category
4	The Java Sugar Industry as a Capitalist Plantation: A Reappraisal	1992	Knight, G.,R.	Second & Third category
5	Indonesia's Colonial Sugar Industry	2018	Knight, R.	Third category
6	Sugarcane Industry and Trade: Lessons Learned from the Applied Policies During the Colonial Era Up Until This Period	2009	Wahyuni et al.	Second & Third category
7	The Sugar Industry	1969	Mubyarto	Second & Third category
8	*Perspektif Pengembangan Industri Gula di Indonesia*	2006	Indraningsih, K., S., and Malian, A., H.	Second category
9	*Kelapa Sawit: Budidaya, Pemanfaatan Hasil dan Limbah, Analisis Usaha dan Pemasaran*	2012	Fauzi et al.	Second category
10	*Kelapa Sawit: Upaya Peningkatan Produktivitas*	1994	Risza, S.	Second category
11	*Materi Kuliah Pengelolaan Kelapa Sawit I*	2018	Ma'ruf A.	Second category
12	*Analisis kebijakan industri gula Indonesia*	2005	Susila, W., R., and Sinaga, B., M.	Second category
13	*Analisis efisiensi penggunaan masukan dan ekonomi skala usaha pada usahatani tebu di Jawa Timur*	1991	Irawan, B., and Hutabarat, B.	Second category
14	*Profil Tebu Rakyat di Jawa Timur*	1992	Rachmat, M.	Second category

Source: Author produced

3.4. Strategies, Processes and Challenges when Conducting Interviews

The primary data in this research is interviews. I conducted the interviews in five different cities with respondents ranging from government officials to businessmen. In planning the interviews, I made a list of stakeholders who I wanted to interview (Boyce and Neale, 2006). Being a government official, I am aware that every government ministry has a ministerial regulation about organization and working procedures. This ensures that there is an organizational structure for each respective ministry and a job description for each official. Moreover, the internet is also a very useful tool to search for the names of relevant officials, since almost all government units at both central and regional level have their own websites where the organizational structure is detailed along with the name and the picture of current officials and their respective positions. Thus, by utilizing the relevant policy documents and the websites of the respective government offices I was able to identify the stakeholders for the in-depth interviews. A summary of the interview respondents is presented in **Table 3.5**.

Table 3.5
Summary of Interview Respondents

Code	Interviewee Title	Place of Interview	Mode of Interview
R1	Head of Aprobi	Jakarta	One on One
R2	Bappeda Dumai Infrastructure Section	Dumai	One on One
R3	Bappeda Dumai Development Planning Section	Dumai	One on One
R4	Bappeda Riau, Head of Division of Planning, Control and Evaluation of Regional Development Planning	Pekanbaru	Focus Group Discussion
R5	Bappeda North Sumatra, Head of Subdivision of Maritime and Natural Resources	Medan	One on One
R6	Bappenas, Energy Planning Specialist	Jakarta	One on One
R7	BPDPKS, Head of Financial Division	Jakarta	One on One
R8	DEN, Board Member	Jakarta	One on One
R9	CIFOR, Researcher	Bogor	One on One
R10	Dinas ESDM Riau, Head of Renewable Energy Division	Pekanbaru	One on One
R11	Dinas ESDM Riau, Head of Section in Renewable Energy Division	Pekanbaru	One on One
R12	PPSDM North Sumatra, Staff Member in Renewable Energy Division	Medan	One on One
R13	PPSDM North Sumatra, Head of Section in Renewable Energy Division	Medan	One on One
R14	Directorate of Bioenergy, Directorate General of New and Renewable Energy, MEMR	Jakarta	Focus Group Discussion
R15	Executive Chairman of GAPKI	Jakarta	One on One
R16	Director of Yearly Crops and Fresher, Directorate General of Plantations, Ministry of Agriculture	Jakarta	One on One
R17	Head of Division in Directorate of Climate Change Mitigation, MEF	Jakarta	One on One
R18	Former Head of Environmental Office of Dumai		One on One
R19	Pertamina, Researcher	Jakarta	One on One
R20	Pertamina, Staff Member in Supply and Distribution	Jakarta	Email
R21	Cipta Elang Perkasa (Private Palm Oil Company), Public Relations/Affairs Officer	Dumai	Phone/email
R22	PTPN IV (State Owned Palm Plantation Company), Supervisor	Sei Mangke	One on One
R23	University of Gadjah Mada, Deputy of Centre for Energy Studies	Yogyakarta	One on One
R24	Ministry of Finance, Head of Section	Jakarta	One on One

Source: Author produced

3.4.1. Interviews with the elites

Although my personal experience gave me an advantage as regards identifying relevant interviewees, interviewing them was undoubtedly the hardest part of the data collection in this research. I did not have prior experience of doing interviews, particularly interviews involving a mode of conversation between two persons with certain purposes (Eyles, 1988; Marshall and Rossman, 2003). Moreover, I view most of my respondents as 'elites' since they hold positions of power and authority in government bodies and companies (Herod, 1999). Thus, interviewing them is different in nature to interviewing ordinary people, since they have power to control the way the research is conducted - for example they may refuse to be recorded, or suddenly cancel the appointment (Valentine, 2005; Mikecz, 2012).

Most of the respondents are categorized as elites and they can sometimes be especially sensitive when discussing information that can cause them discomfort. For example, such sensitivity was obvious when I wanted to clarify the statement from one respondent who mentioned that land used change was necessary for the expansion of palm oil plantations. Since this respondent was a representative of a palm oil company, he was irritated when I tried to connect his statement with the deforestation associated with palm oil expansion. Thus, to calm the situation, I immediately nodded and agreed with his statement and moved on to the next question. Another respondent asked me to turn off the recording device. He explained that the relationship between the biodiesel industry and palm oil industry involved sensitive information that he wanted to share with me, but he refused to be quoted. Hence, an uncomfortable situation may occur if a question is too critical or the information too sensitive for the respondent.

However, I experienced a contrasting situation when I undertook interviews with government officials - a critical question would often result in constructive outcomes instead of discomfort. This is evident in that some of the government respondents clearly stated that I could use all information being recorded, since this research could potentially benefit the Indonesian government in formulating its future biofuel policy. Some of these respondents even stated that the public should be aware of the politics concerning biofuels. Although I found that government respondents were usually more open to questions than private stakeholders, they were middle ranking officials whilst respondents from private companies were generally the head of an association or the business. In this context, the former do not have the authority for policy making unlike the latter. Thus, it is also important to understand the position of the respondent prior to the interview as this can affect the information it is possible to glean (Mikecz, 2012).

In conducting the interviews, I applied a semi-structured technique. I had a series of questions for respondents that included mainly open-ended questions so they could speak freely and reflect on their own experiences (Kitchin and Tate, 2000). In this way, I could achieve valuable insights from talking with the respondents and many important themes emerged during the analysis. I also found that certain respondents could provide very interesting information without pausing and thus without prompting on questions that I would have covered later in the interview. This is common in open-ended research interviewing and it was advantageous in many senses as it allowed for a flowing conversation and less formal interview process. However, it also created challenges, as I sometimes lost track of what questions had and had not been answered. Thus, memorizing key questions was a preferable solution alongside accessing the question sheet during the interview. This allowed me to retain an element of control within the interview process and keep the interview on track and on topic.

There are a few other difficulties that emerged when interviewing the elites that can be categorized as ranging from minor to major. Minor problems included holding the interview in a noisy environment, as well as sudden cancellation of a scheduled interview. These minor problems were manageable and anticipated (Kezar, 2003; Mikecz, 2012). However, there were still challenges in overcoming some minor problems such as when a respondent wanted to have an interview in a crowded restaurant during lunch time. The dominant sound recorded was sometimes the surrounding noise rather than the respondent's voice and then the only solution was to invest more time in transcribing the recorded interview.

Other challenges that I categorise as 'major' related to lack of any notification for a cancelled interview. For example, in a scheduled interview with a high-level official from a notable university in Indonesia. I knew the respondent personally which gave a sense of familiarity when I contacted this person directly. However, when I arrived at the respondent's office in Yogyakarta - a one hour flight from my home base in Jakarta - the respondent had disappeared without prior notification either through email, short text message, or phone call. Although I am aware that respondents have the right to decline an interview, I also learned that as a researcher I should prepare myself emotionally since a respondent can at any time refuse an interview, even just a minute before it commences (Farber, 2006; Mikolajczak et al., 2007). The mitigation for this problem is to keep emotionally calm and hide any disappointment while trying to find an alternative respondent (Hochschild, 1983).

3.4.2. Gaining Access to Respondents

Failing to meet a respondent is problematic, yet it is sometimes unavoidable as previously discussed. However, I realize that my failure to meet a respondent might relate to the fact that I somehow ignored the important role of a gatekeeper. According to Farber (2006) the gatekeeper is the person who will decide if we can reach a respondent or not. Thus, the gatekeeper role cannot be overlooked as gatekeepers may have the required influence to connect a respondent with a researcher (Seidman, 2013). In terms of interviewing elites in Indonesia, I found that it is important to identify the gatekeeper and the closeness of his/her relationship with the respondent. In this research, gatekeepers are classified into two types: Type 1 - gatekeeper is important; and Type 2 - gatekeeper is less important.

The type 1 gatekeeper is usually the respondent's secretary or personal assistant. During this research, I found that a secretary/personal assistant is close to the respondent and his/her daily activity is often associated with the respondent's daily activity. This gatekeeper knows the respondent's whereabouts, activities, business engagements and most importantly any free time. This is important as my position as an interviewer is considered insignificant within the respondent's tight schedule (Kezar, 2003). Thus, the interview can only happen if it is scheduled within the respondent's timetable/diary.

The type 2 gatekeeper can include the colleagues, friends and families of the respondent. These people often have the closest personal ties with the respondent, such as family members. However, they may not know about the respondent's daily activities and diary schedule, but can provide the respondent's contact details such as an email address or personal phone number. However, I found that contacting a respondent directly usually culminated in failure as the respondent may not even reply to my email. Even in cases where respondents replied to my contact and were aware of my intention to conduct an interview, it sometimes resulted in their sudden lack of availability as in the case of the interviewee discussed above who I contacted on a personal (as opposed to professional) basis.

Since the type 1 gatekeeper is the closest person within the *working* life of the respondent, this is also the person who knows whether the respondent is willing to be interviewed. Although, such gatekeepers do not usually have the power to influence the respondent's decision to accept an interview with me, having their support is essential since I can ask them about the respondent's schedule to increase the likelihood of an available interview slot (Berg, 1999). I soon realised the need to have a flexible schedule to accommodate the respondent's limited availability (Kezar, 2003). However, the gatekeeper can also choose to exert power over me by restricting my access to the respondent (Sixsmith et al., 2003). Thus, they may be approachable in the beginning, but after a second or third contact, they may just ignore my emails, text messages, or phone calls. This was problematic since I had no way of knowing who does not want to meet me; it could be the respondent, or perhaps the gatekeeper who has failed to schedule a meeting slot.

3.4.3. The Respondents

Understanding the gatekeeper role is also related to understanding the respondent, as not all respondents have a gatekeeper. Based on the 24 respondents in **Table 3.5**, I categorize them into three types based on their occupation (see **Table 3.6**)

Table 3.6
Respondents' Occupations

1.	**Government Officials**
	Bappeda Dumai Infrastructure Section
	Bappeda Dumai Development Planning Section
	Bappeda Riau, Head of Division of Planning, Control and Evaluation of Regional Development Planning
	Bappeda North Sumatra, Head of Subdivision of Maritime and Natural Resources
	Bappenas, Energy Planning Specialist
	BPDPKS, Head of Financial Division
	Dinas ESDM Riau, Head of Renewable Energy Division
	Dinas ESDM Riau, Head of Section in Renewable Energy Division
	PPSDM North Sumatra, Staff Member in Renewable Energy Division
	PPSDM North Sumatra, Head of Section in Renewable Energy Division
	Directorate of Bioenergy, Director General of New and Renewable Energy, MEMR
	Directorate of Plantations, Ministry of Agriculture, Director of Yearly Crops and Fresher
	Head of Division in Directorate of Climate Change Mitigation, MEF
	Former Head of Environmental Office of Dumai
	Ministry of Finance, Head of Section
2.	**Private Stakeholders**
	Head of Aprobi
	Executive Chairman of GAPKI
	Pertamina, Researcher
	Pertamina, Staff Member from Supply and Distribution
	Cipta Elang Perkasa (Private Palm Oil Company), Public Relations/Affairs Officer
	PTPN IV (State Owned Palm Plantation Company), Supervisor
3.	**NGO, Academics and Others**
	DEN, Board Member
	University of Gadjah Mada, Deputy of Centre for Energy Studies
	CIFOR, Researcher

Source: Author produced

Government Officials

Although Indonesia's biofuel policy is formulated at national level, interviews with regional government officials are necessary to understand their points of view regarding biofuel policies. It is also relevant to understand their perspectives on how the policy should be implemented. Yet, I did not distinguish government respondents based on a scale from national to regional level since I only aimed to interview middle ranking officials. All government tiers in Indonesia are structured in at least four echelons where the first echelon is the highest in the hierarchy. The reasons for selecting the middle ranking echelon as research respondents are detailed below.

The first factor in selecting middle ranking officials concerns being able to find respondents with availability for an interview. Based on my professional experience working as a central government official in Indonesia for more than a decade, it is highly unlikely that a PhD researcher would be able to obtain a face-to-face interview with officials from the first and second echelons of the ministries. They are very busy people with full agendas and usually delegate interview requests to their subordinates in either the third or fourth echelons. Interviews for research purposes, mass media coverage (except for official press conferences) and even interviews with international agencies, are undertaken by officials in the third and fourth echelons after they have received consent from at least the second echelon within the respective ministries.

Secondly, middle ranking officials are the most likely to have insightful information as they usually know the detail of policies, such as constraints in executing policies based on the reality ‘on the ground’. In addition, interviews with people from the middle echelons offer a realistic possibility of receiving a genuine answer, instead of a ‘normative’ one providing there is trust between the researcher and respondent (Mikecz, 2012). Moreover, having a personal connection with the respondent, such as being a former colleague, increases the likelihood of obtaining information that is not published in the media. Despite not being published, the information provided is not considered to be classified, since permission has already been received from the respondent.

However, even without any friends or colleagues within a respondent's office, I found that contacting a high level official, in the first or second echelon, was much easier than I assumed. Initially, I needed to send an official letter by email explaining the research purpose and how the interviews would be conducted with respective government officials. This was followed up promptly with phone calls to the respective institution when I would talk to the relevant gatekeeper. In this context, the gatekeeper was usually the secretary of the first or second echelon officials when their contact numbers were available on the respective ministry websites. In the phone call I introduced myself and reminded the gatekeeper that I did not suddenly make contact and ask for an interview (as I had previously emailed). I politely asserted my intention and developed trust with the gatekeeper and subsequently the superior official (Kezar, 2003). I found that this method of approaching elite government officials was the most effective way of obtaining an interview – and I had a 100% success rate. Moreover, if the respective official was unable to meet for an interview, the official usually assigned his/her subordinate instead.

Approaching provincial and municipal/district government officials is different to approaching their central government counterparts. In this context, a direct approach supplemented by a permit letter from the regional government issuing authority is usually sufficient to establish contact with a respondent. Moreover, having a personal contact number for a local government official at any level is recommended. I used my friend within the university alumni network and he gave me the personal numbers of local government officials whom he knew could assist me during the field research. Using these contact numbers, I managed to gain access to and conduct interviews with provincial and municipal government officials without having to go via gatekeepers.

Private Stakeholders

Gaining access to private stakeholders proved more difficult than accessing government officials. This was partly because I did not have contact with anyone from the relevant private companies. Moreover, these respondents did not have their names and office phone numbers on websites - in contrast to government officials. This created difficulties for me in identifying the relevant gatekeepers to approach and in establishing contact with respondents. To solve this problem, I applied a snowballing method which is a method of approaching a potential respondent by asking the current respondent who that person is or how to get in touch with that person (Noy, 2007; Becker 1953). Thus, I asked the government officials who I was interviewing about contacts within any biodiesel, palm oil and fossil fuel companies. This method was effective in terms of making gatekeeper contact and then through the gatekeepers I was able to interview the Head of APROBI (*Assosiasi Produsen Biofuel Indonesia*/Indonesia's biofuel producer association) and the Head of GAPKI (*Gabungan Pengusaha Kelapa Sawit Indonesia*/ Indonesia's palm oil association). However, this method did not always guarantee success in interviewing respondents, as there remained challenges in gaining the trust of respondents via their gatekeepers (Kezar, 2003; Mikecz, 2012).

Qualitative researchers (e.g. Zuckerman, 1972; McDowell, 1998; Welch et al., 2002; Okumus et al., 2007) argue the importance of the researcher's ability to present him/herself to the respondent in a way that allows them to quickly assess the researcher's credentials, affiliation, eligibility and even credibility before replying to the initial contact. Since this research is focused on biofuel policy and politics, I was promptly acknowledged by the gatekeeper for the Head of APROBI who replied to my message and arranged an interview. A minor problem emerged when I contacted the gatekeeper for the Head of GAPKI, as the gatekeeper ostensibly suggested that the Head of GAPKI was not a suitable respondent for the research. Thus, I had to use my verbal communication skills over the phone to explain the relevance of the respondent to the research. I also sent my credentials to the gatekeeper by email which eventually resolved the problem.

Nevertheless, there were also failures in arranging interviews, particularly with private biodiesel companies and fossil fuel businesses. To make contact with a private biodiesel company, I applied the snowballing method using my other respondents to recommend a relevant company which they viewed as approachable and suitable for interview. Then, I contacted the company via the gatekeeper. However, the intended interview culminated in failure as the gatekeeper did not reply to any of my attempts at communication.

Another failure occurred when I attempted to obtain an interview with a fossil fuel company – Pertamina - which has a significant role in biofuel policy implementation (as discussed in detail in Chapter 6). The company refused to accept my credentials stating that the University of Exeter should send the credential documents and they should be signed by at least the head of the school or department. This proved problematic since I only had one set of research credentials for approaching respondents. I interpreted the difficult and awkward terms and conditions imposed by the elites in Pertamina as a sign of their refusal to be interviewed.

Although I failed to conduct an interview with a middle ranking official at Pertamina in its Jakarta headquarters, I made a second attempt in Dumai where Pertamina has a regional office. I managed to establish contact with someone from Pertamina due to a link between one of my local informants and a middle ranking employee at Pertamina's branch office in Dumai. However, this attempt also resulted in disappointment as the official was uncooperative and stated that I should contact the company's headquarters in Jakarta (which had already refused an interview).

At this point, I realized that I had failed to gain the trust of some potential respondents. Although the reason for rejection is still unclear, I believe that the research focus might be a contributing factor. Potential respondents may view this research as critical of their enterprises and thus they are hesitant to speak to me (Mikecz, 2012). I also learned that a gatekeeper is not necessarily a secretary as with the government officials; gatekeepers for these private stakeholders can hold any position from a personal assistant to a manager. Thus, they may be in a position of seniority whereby they can refuse any research which they think is not in the interest of their company (Sixsmith, 2003; Mikecz, 2012).

Interviewing private elite stakeholders in this research is not only about gaining access and establishing trust with the gatekeeper, but also about finding the right informant. During the field research in Dumai, I discovered that my informant had personal connections with some managers in the companies operating in the city including Pertamina and some biofuel companies. Thus, he used his personal network to contact relevant people who could be potential respondents. Despite being unable to obtain an interview with middle officials in Pertamina, he managed to arrange an interview for me with a manager from Cipta Elang Perkasa Ltd, a biofuel company. Unfortunately, I was running out of time to conduct the field research and as such I had to be content with obtaining a written response in the formed of email instead of undertaking an in-depth interview (Burns, 2010).

Although I experienced a few setbacks with officials from Pertamina, I still managed to gain information from this other company official. However, the official was not particularly knowledgeable about biofuel politics in Indonesia since his role was not directly related to biofuel policy implementation. However, I accepted the information provided as it was readily available to me. I was again cognisant of the challenge of interviewing elites who can decide what answers to provide and what information they are willing to share with the researcher (Kezar, 2003).

NGO, Academics and Others

Conducting interviews with respondents from NGOs and academics can be tricky if they exhibit features similar to the private stakeholders discussed above. Many of these respondents hold more than one position. For instance, the R8 respondent is a member of DEN (*Dewan Energi Nasional*/National Energy Board) and also an academic in a private university in Jakarta, as well as having ties with an NGO. Conversely, the R9 respondent is a full-time researcher in CIFOR and does not have another position elsewhere. Thus, the role of gatekeeper is significant for the former, but insignificant for the latter.

To summarise, the problems of gaining access and earning trust vary between each respondent and are even different from one research study to another in terms of the way to approach a respondent (Mikecz, 2012; Battacherjee, 2012; Tomei, 2014). I learnt from this research experience that government elites tend to be much easier to approach - with or without having to go through a gatekeeper. This may relate to my experience as a government official prior to conducting the research. Moreover, the higher the elite's position in the organizational structure the more likely that the gatekeeper will have a significant role which should neither be ignored nor bypassed. However, the most important aspect I learnt when gaining access to respondents was the significance of reflection after the interview (Mikecz, 2012). Thus, instead of regretting a failed interview attempt, I determined that it is better to evaluate and understand what contributed to the failure and modify the next interview schedule accordingly.

3.4.4. The Interview Process

For the purpose of the interview, I used a semi structured format with open-ended questions since it gave flexibility for the respondent to answer the questions based on their own experience (Kitchin and Tate, 2000; Battacherjee, 2012). There were approximately 10 questions for each respondent and each type of respondent received somewhat different questions based on their role and expertise (Appendix 4). The respondents were generally content to be recorded during the interview and not overtly bothered by the recording device.

Despite the different questions for each type of respondent, the first question was always the same - it asked about the respondent’s role in delivering or implementing the biofuel policy. After conducting several interviews, I realized that the first question also allowed the respondent to explain his/her experience of the biofuel policy, which unexpectedly answered other questions that would otherwise have been covered later in the interview. In this context, giving the respondent a straightforward starting question served to help establish trust with the interviewer (Farber, 2006). As a native Indonesian, I understand that a conversation between colleagues can often cover a variety of issues. This is similar to the interview experience where after the first question, most respondents just talk freely and new relevant information can be extracted with greater ease. The open ended nature of the interview led to different lengths of interview for each respondent - ranging from 40 minutes to 120 minutes. Those who possessed most knowledge about the biofuel policy and politics also tended to talk the most.

Having the respondent talk continuously can also be counterproductive as their discussion can sometimes move off topic, which prolongs the interview but with irrelevant information being extracted. Again, my understanding of Indonesian culture and convention proved important as I was aware that cutting off someone's discussion can be considered rude, so I chose to navigate the discussion by introducing interview questions linked to the issue currently being discussed and thus aimed to steer the interview back to the relevant topic. Occasionally, the respondent would keep talking and drifting away from the topic and it was difficult to navigate back to the interview questions. In this context, it was appropriate to halt the discussion and assert my position as the interviewer. In summary, I would allow respondents to talk off topic, but only for a limited time which proved acceptable to them and me.

There were also circumstances where I had to prepare for the unexpected during an interview. For example, one of the respondents, due to his limited time to meet with me, had requested a change in interview venue that was desirable for him but undesirable for me. The interview location was moved to a restaurant during lunch time and the restaurant was very crowded. The loud noise from other restaurant guests caused difficulties with staying focused on the topic and also led to a poor recording of the discussion which was difficult to transcribe.

Another example of an unexpected interview circumstance related to a change of interview mode. I designed the interview as a one-to-one discussion, yet there were a few interviews that unexpectedly became focus group discussions. The style changed from one-to-one interviews into a discussion with several elites at the same time and in the same location. This situation arose a few times particularly with government stakeholders (see **Table 3.3**) where the respondent was a middle level government official and the respective official would command his/her subordinate to attend the meeting with me. Although such a condition could be advantageous as I could potentially obtain more information from two respondents, it also created difficulties for me particularly regarding who said what in the discussion. Moreover, I found it difficult if the one-to-one interview suddenly changed into a group discussion, because I struggled to ensure my participants stayed on topic.

Despite being a native Indonesian, I also encountered a problem with the respondents' language particularly if respondents stated a simple phrase. For example, many of my respondents said the phrase *"...kan gitu."*, which is directly translated as "…this." This phrase, although it appears simplistic, proved problematic. The phrase is a common expression that can indicate an important matter, but the person who says it may consider it is something that everybody knows, so there is no need to state it explicitly. This was a particular problem when I was not aware that the respondent mentioned the phrase during the interview, but noticed it during the transcription process. The phrase may be important, but it requires extra effort to 'decode' it. In this case, reflection from my personal experience was very useful to help 'decipher' the implicit meaning of the respondent. I will discuss this further in the section 3.6.

3.5. The Field Study

The final element of my research methodology involved field site observations at biodiesel companies, which I undertook when visiting to conduct interviews. The visits were important as they helped develop my understanding (from my field notes and research diary) of the efficiency of the biodiesel industry when it joined with the palm oil industry (Newbury, 2001). I conducted field observation by seeing each site personally and observing the building and its surrounding environment to understand its function followed by note taking after returning to my accommodation (Mulhall, 2002). Observations were undertaken in both Dumai City and Sei Mangke as these areas have an industrial zone controlled by the palm oil industry. I will explain my observation results in detail for Dumai City since I was able to make a direct comparison between two industrial zones, one controlled by a palm oil company and the other by local government

I conducted my observation for seven days in Dumai which I considered would be sufficient for this purpose. However, commuting in this city turned out to be unpleasant since there was no reliable public transportation system with the locals preferring to use a private car as a means of commuting. This proved a major challenge for me since I had never visited Dumai before and did not know the area. Fortunately, I had a good contact in this city who worked as a Dumai municipal government official. My contact person, named Boby as a pseudonym, was a very resourceful person and he helped me during the field study by taking me around Dumai in his car and he showed me all the places that I wanted to see in this city, particularly the industrial zone. He also introduced me to his acquaintance, Pak Agus (a pseudonym), who used to be the Head of the Dumai Environmental Office. Being a (former) Head meant Pak Agus knew many prominent people within the industries that conducted their operations in Dumai which was helpful for my research (despite a few set-backs as discussed above). Although my informant's role was limited to acting only as a guide and liaison, it was very important to me as it helped me to muster data from the field observation (Mulhall, 1993 as found in Mulhall, 2002).

Dumai is a port city where some of the coastal area is privately owned by either oil companies such as Pertamina and Chevron, or palm oil companies such as Wilmar. These companies own the coastal area with the purpose of establishing their own harbour and thus independently conducting export and import activity for the extracted goods such as oil, gas and crude palm oil (CPO). There are many palm oil industries operating in Dumai including the largest palm oil company in Indonesia, Wilmar. Interestingly, I could not find any biodiesel factory which stood independently in the city - my observations concluded that all biodiesel companies are inside palm oil industrial complexes. These complexes are located inside industrial zones in Dumai city, Pelintung and Lubuk Gaung.

The Pelintung industrial zone (IZ) is located in the south east of Dumai. This IZ is owned solely by the Wilmar Group and only companies related to Wilmar can operate in this zone. Thus, the IZ is clear of any activity conducted by locals, since Wilmar bought the whole area to facilitate the establishment of the zone. Although this IZ has a security check point at its main entrance, the locals can go in and out of the zone freely. The purpose of the check point is not to scrutinize anyone who wants to enter the zone, but to check those who want to exit to prevent theft. My informant confirmed that the whole Pelintung area is accessible except for entrance to individual facilities inside the zone.

Conversely, there is a stark difference between Pelintung IZ and Lubuk Gaung IZ. Lubuk Gaung IZ is located in the north west of Dumai and it is a more newly established zone than Pelintung IZ. It is used by many different companies, mostly those related to palm oil. Despite its status as an industrial zone, it is disorganised with palm oil factories scattered between the houses owned by locals. My purpose in visiting Lubuk Gaung IZ besides observation was because my informant had a link with the general manager of Cipta Elang Perkasa Ltd. - a biodiesel company. There is a difference in the way the two industrial zones are managed - Pelintung is privately managed, whilst Lubuk Gaung is managed by the regional government. However, a similarity is that the palm oil industry is established within an industrial complex rather than as a 'stand-alone' individual factory. This will be discussed further in Chapter 5 (which considers the factors that contribute to the advantages of the biodiesel industry using palm oil as feedstock) and Chapter 7 (which considers the industrial advantages of an agro-fuel alliance between the palm oil and biodiesel industries).

The third IZ visited, Sei Mangke, has totally different features to the other two IZ. This IZ is jointly owned by PTPN (Nusantara Plantation Ltd) III and PTPN IV - both are state owned palm plantation companies. Unlike Dumai City which is geographically close to the sea, Sei Mangke is located further inland and thus it does not have sea access (**Picture 3.2**). This means the IZ does not have a harbour that can serve the factories inside the zone. Thus, there is a stark difference in terms of the IZ facilities particularly between those with private palm oil companies operating in the area such as Pelintung and Lubuk Gaung and those with state owned palm oil companies such as Sei Mangke.

3.6. Data Analysis and Writing Process

This section explains the data analysis in this thesis and the writing process. Analysing qualitative data was the most arduous process in this research because it is a dynamic process which requires intuition, creative thinking and inductive reasoning (Basit, 2003). The research employs an abductive analysis as it examines biofuel politics by utilizing a variety of data including interview and policy documents. Abductive analysis is a creative process for producing a new hypothesis or theory based on 'surprising' evidence (Peirce, 1931 as found in Timmermans and Tavory, 2012). This analytical method allows a researcher to use multiple sources of data, including his/her own perception, to test the existing theoretical framework and enhance current knowledge of the theory (Dubois and Gadde, 2002).

An abductive analysis to study Indonesia's biofuel politics requires complex data sources as discussed above and the sources are given the same level of importance in this research. Using a variety of data allows the researcher to reveal aspects that have contributed to biofuel politics but have been neglected in previous research (Dubois and Gadde, 2002). The research findings are more likely to be accurate and convincing if they use multiple types of data instead of just focusing on one data type whilst treating other data as secondary sources (Yin, 1994). Another important aspect of this analysis is to combine the data and interpret it as a whole to elicit a cohesive and solid research answer - and this process began at the transcription and translation stage.

3.6.1. Transcription and Translation Process

The interviews provided a large data set and unlike the other textual sources needed to be processed prior to analysis. I found the transcription a challenging task. The challenge involved interpreting what the respondent stated in parts of each recording. Indonesians often use simple phrases to explain something whilst assuming that everyone will understand what the simple phrases mean. Working as a government employee provided tacit knowledge and thus I used my intuition to understand the meaning of phrases (Polanyi, 1962). Understandably, this could create bias from my own position as the researcher since the real meaning of the phrase might be different to my interpretation. Dey (2003) argues that there is no uniform method for qualitative analysis where the researcher can utilise all the data obtained in an attempt to answer the research question. Based on his argument, utilizing creative thinking and textual data such as government policy documents and media interviews is also a valid method to confirm my intuition which reduces the likelihood of bias in my interpretation (Polanyi, 1962; Yin, 1994).

The transcription process is also an arduous activity because it takes at least three times longer than the original recording to do the transcription. This requires stamina and perseverance as most of the interviews are at least 60 minutes in length. Thus, utilization of devices, such as a foot pedal, for transcription increased the efficiency of transcribing by significantly reducing the time needed to transcribe one interview.

Being a native Indonesian also gives me an advantage as I did not need to translate *all* of the data into the research language, English. This also increased my efficiency analysing the data, since most of the data collected is in my native Indonesian language. Nevertheless, this does not mean that translation is unnecessary since quotations from the data were needed to support and evidence my arguments and these quotations had to be translated into English. This influenced my decision to translate only the quotations shown in the empirical chapters to save time and resources.

The Indonesian language is a relatively simple language where one uses relevant vocabulary to explain something without having to pay attention to structure and complicated tenses. This makes the language easy to learn but complicated to translate properly. As a native Indonesian, I also understand that it is a common practice for a person to speak using a simple phrase (as discussed) above and talk without getting straight to the point. Thus, using a translation programme, whilst being helpful in terms of finding the vocabulary for a translated word, is problematic as direct translation of the manuscript to English can potentially make the translation unreadable for native English readers. To avoid the 'lost in translation' problem, during the translation process I used my intuition (Polanyi, 1962) to refine what the respondent had stated and ensure the broader meaning was communicated, rather than focusing on a verbatim translation .

Table 3.7

Sample of Interview Translation Process

Original manuscript in Indonesian Language:
"Gak masuk akal kalau mencapai 30 juta ton karena produktivitas nasional antara 3.5- 4 ton CPO per hektar kalau Malaysia sudah menuju 4-5 ton per hektar. Tapi kalau melihat angka-angka kebun BUMN sudah mencapai angka 5 ton tapi kebun rakyat paling Cuma 2-3 ton per hektar"
First direct translation to English using translation programme:
"It doesn't make sense to reach 30 million tons because the national productivity is between 3.5 to 4 tons of CPO per hectare if Malaysia is already headed for 4-5 tons per hectare. But if you look at the BUMN garden figures, it has reached 5 tons, but people's gardens are only 2-3 tons per hectare"
Refined English translation for quotation purposes:
"Companies can earn yields up to 5 tons/hectare while smallholders provide just 2-3 tons/hectare"

Source: Author Produced

Table 3.7 provides an example of the translation process necessary to ensure that a respondent's statement becomes meaningful. In the first translation stage, I utilize an online translation programme which results in information which is difficult to discern as some words are confusing and to some extent the translation does not make sense. This shows that using personal knowledge to refine the translation is not only important, but also necessary to ensure the translation is legible and meaningful (Dey, 2003).

3.6.2. Coding Process

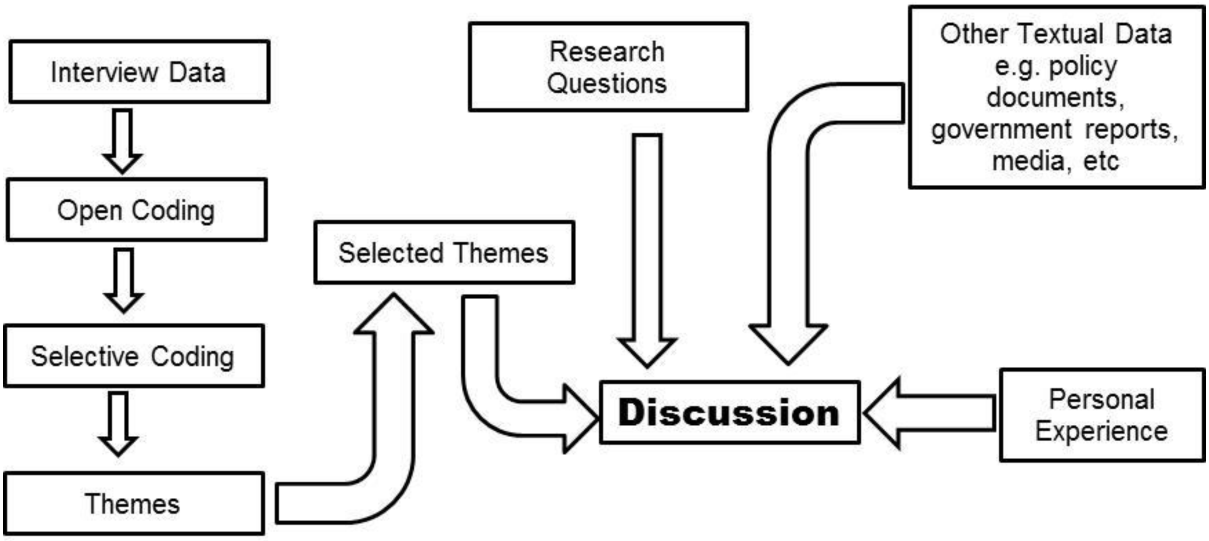
Transcribing the interview data is essentially converting it from non-textual data into textual data. This makes the process of categorizing data much easier, particularly when grouping the recurrent themes - also known as the coding process (Battarcherjee, 2012). I utilized NVivo software, which is commonly used for coding qualitative data (Basit, 2003). However, during the coding process, I also used other software such as MS Excel to construct my codes before moving it into NVivo, as I am more familiar with using MS Excel than NVivo.

For the coding process in this research I followed an approach broadly aligned with grounded theory analysis (GTA) (Urquhart, 2017). This method was first developed by Glasser and Straus (1967) and they describe it as the discovery of theory grounded in data. In this context, GTA relies primarily on transcribed scripts from interviews/speeches where a theory will emerge that will either complement or challenge the theory existing in the wider literature (Charmaz, 2006; Urquhart, 2017). Thus, the coding process aims to extract emerging themes based on the information revealed by the respondent (Charmaz, 2006), rather than looking for themes derived from existing theory.

I conducted two stages of coding. The first stage of coding was open coding to scrutinize line by line the transcription to obtain the meaning behind the respondents' statements (Charmaz, 2006) (**Appendix 2**). After finishing the open coding, the codes were reclassified into selective codes or analytical codes as a means of regrouping the open code into wider themes. During the second stage of coding, the selective codes were reclassified into seven themes (**Appendix 3**). These themes were categorized based on my intuition of what classifications were suitable from the smaller themes emerging from the respondents' statements (Urquhart, 2017).

I conducted an abductive analysis that used strands from GTA particularly when coding the interview data. In this context, the coding process is only part of the overall analytical process (**Figure 3.1**). To ensure the rigour of the thematic interview coding, I combined the emerging themes systematically with other data sources such as policy documents, government reports and media interviews (Dubois and Gadde, 2002). This systematic combining of themes was guided by the research question being explored in the research.

Figure 3.1
Data Analytical Framework



Source: Author Produced

This is where the analysis became more complicated as I started to match the themes emerging during the coding process with other data sources – always guided by the research questions. The process is often repeated and iterative as I needed to return to the interview data to confirm the findings from other data sources and vice versa. Moreover, since the analysis was guided by the research questions, some of themes emerging proved irrelevant and thus I decided to keep an archive for potential future research.

The other textual data such as policy documents and so on, did not need to be coded in the same manner as the interview data. It was much easier to find the parts relating to the theme of discussion in the documentary data which made detailed coding unnecessary. Nonetheless, analysing textual data particularly policy documents also requires an in-depth understanding of the wording. Indonesia's policy documents often comprise many articles and clauses that merely refer to other articles and clauses in the same document (see **Table 3.8**). This meant that reading the policy documents required careful attention to avoid misinterpretation of the policy. **Table 3.8** shows an example of a policy document analysis where the process of quoting from a part of the policy requires a thorough reading of nearly the whole document. Almost every article links to another previous article and I need to create a quotation that resembles what the policy entails in a succinct and straightforward way

Table 3.8
Sample of Policy Document Translation Process

Original manuscript in Indonesian language:
Pasal 3 *(1) Untuk meningkatkan pemanfaatan Bahan Bakar Lain dalam rangka ketahanan energi nasional sebagaimana dimaksud dalam* ***Pasal 2****, Badan Usaha Pemegang Izin Usaha Niaga Bahan Bakar Minyak dan Pengguna Langsung Bahan Bakar minyak wajibmenggunakan Rahan Bakar Nabati (Biofuel) sebagai Bahan Bakar Lain secara bertahap.* *(2) Pentahapan kewajiban penggunaan Bahan Bakar Nabati (Biofuel) sebagai Bahan Bakar Lain sebagaimana dimaksud pada ayat (1) dilaksanakan sesuai dengan ketentuan sebagaimana tercantum dalam Lampiran Peraturan Menteri ini.*

Pasal 5

Badan Usaha yang melaksanakan Kegiatan Usaha Niaga Bahan Bakar Nabati (Biofuel) sebagai Bahan Bakar Lain wajib:
a. menjamin ketersediaan Bahan Bakar Nabati (Biofuel) sebagai Bahan Bakar Lain untuk memenuhi kebutuhan dalam negeri secara berkesinambungan; dan
b. memanfaatkan dan mengutamakan Bahan Bakar Wabati (Biotuel) dari produksi dalam negeri.

Pasal 6

Terhadap Badan Usaha Pemegang ijin Usaha Niaga Bahan Bakar Minyak dan Penguna Langsung Bahan Bakar Minyak sebagaimana dimaksud dalam ***Pasal 3*** *yang melaksanakan kewajiban pemanfaatan penggunaan Bahan Bakar Nabati (Biofuel) sebagai Bahan Bakar Lain secara berkesinambungan dan Badan Usaha yang melaksanakan Kegiatan Usaha Niaga Bahan Bakar Nabati (Biofuel) sebagai Bahan Bakar Lain sebagaimana dimaksud dalam* ***Pasal 5*** *dapat diberikan insentif baik fiskal danlatau non-fiskal sesuai dengan ketentuan peraturan perundang-undangan.*

First direct translation to English using translation programme:

Article 3

“(1) To increase the utilization of Other Fuels in the context of national energy security as referred to in Article 2, Business Entities of Oil Fuel Business License Holders and Direct Oil Fuel Users must use Biofuel as Fuel
Others gradually.
(2) The obligation to use Biofuel as another Fuel as referred to in paragraph (1) shall be carried out in accordance with the provisions as contained in the Attachment to this Ministerial Regulation.

Article 5

Business entities that carry out Biofuel Business Activities as Other Fuels must:
a. guarantee the availability of Biofuel as another Fuel to meet domestic needs on an ongoing basis; and
b. utilize and prioritize Biofuel from domestic production.

Article 6

Towards Business Entity Holders of Fuel Business Oil and Direct Oil Fuel Users as referred to in ***Article 3*** *which carries out the obligation of utilization use of Biofuels as Other Fuels on an ongoing basis and the Business Entity that implements it Biofuel Business Activities as Materials Other Burns as referred to in* ***Article 5*** *may be granted both fiscal and non-fiscal incentives in accordance with the provisions legislation."*

Refined English translation for quotation:
“Fuel companies and direct fuel users, which implemented the mandatory blending policy, as well as biofuel companies that supplied biofuel for the former, can all be given both fiscal and non-fiscal incentives.” *(Ministry of Energy and Mineral Resources - Regulation Number 32, 2008, Article 6)”*

Source: Author Produced

3.6.3. The Writing Process

Writing is a means to understand the research findings where the researcher includes his/her position within the writing (Richardson, 1998). I found that the analytical process continued and became more dynamic as I strived to finish the writing of the thesis. Thus, although the writing process was conducted at the end of the research, it did not mean that the analytical process had stopped by this stage. In fact, both data analysis and thesis writing intersected. Indeed, during the process of writing, I often had to reconsider the data analysis and if the argument in the discussion needed strengthening I would scrutinize the data again to provide more evidence for the argument or provide nuance.

Moreover, the process of developing the thesis was not sequential with the writing conducted in order from the first to the last chapter. Instead, the writing started with a review of the literature followed by the empirical chapters with methodology, introduction and concluding chapters written at the end. I used this pattern of writing as a means to increase my writing efficiency and to sharpen the analysis.

3.7. Concluding Thoughts

This chapter has explained the methodology and methods used in this research study. It has also shown that research is a process as well as a product and it is important for the researcher to reflect on this during the research (England, 1994). Conducting qualitative research is not a static process, rather it is a dynamic one that requires the researcher to use intuition and creativity to accomplish the research. Furthermore, acknowledging the researcher's position is essential – hence the confirmation running through the thesis that I am a native Indonesian and have been a government official working within the policy making sphere. There would have been a heightened potential for bias in the analysis had I not been reflexive about my own positionality. With due attention to these issues, however, I have found my background/career experience to be an asset in enhancing my understanding of the policies and politics engulfing the biofuel programme in Indonesia.

In the following chapters, the empirical analysis is the focus. These chapters are structured around the research questions (see **Table 3.1** above). Chapters 4 and 5 address questions 1 and 2 respectively, while Chapters 6 and 7 address question 3 in two parts. The next chapter focuses on the ways that historical policy and wider development processes have shaped the current trajectory of Indonesia's biofuel policy.

Chapter Four

The Politics of Crops:

The Impact of Agrarian Policy on the Biofuel Feedstock Agro-Industry

This chapter aims to answer the question: how has the longer-term history of agrarian development in Indonesia shaped modern day biofuel production? I argue that the crops characteristics, together with the agrarian policy implemented by the government in the past, has been one of the strongest influences in determining the trajectory of the implementation of biofuel policies. Primarily because it underpinned the use of biofuel policy as a business expansion opportunity for certain large agro companies. The chapter uses the lenses of political ecology and agrarian political economy to understand the politics of crops for biofuel feedstock. It focuses on examining the dynamic agrarian transformation influenced by colonialism in the context of developing countries such as Indonesia. I will focus the analysis on the specific crops that the government used in developing domestic biofuel industries – these are sugarcane for bioethanol and palm oil for biodiesel. In doing so, I will utilize the interview data from field research conducted in 2017 and from secondary sources in the form of media interviews, government reports and policy documents, as well as working papers and books that focus specifically on Indonesia's sugar and palm oil industries.

This chapter will be composed of three sections followed by a summary and conclusions. The first section analyses the way sugarcane and palm oil were being institutionalized under the colonial agrarian policy. The second section analyses the agrarian policies for both sugarcane and palm oil particularly in the period of the 1970s to 1980s. The agrarian policies in this era are the crucial factors that determined the path of industrialization for these crops and eventually shaped the conditions for both crops when the government implemented its biofuel policies. This section is divided into two subsections explaining the agrarian policies related to sugarcane and palm oil respectively. Finally, the third section explains the government's intention in selecting specific crops for its biofuel policies and establishes that there is a gap in the wider literature about biofuel policies, particularly when combining political ecology and agrarian political economy. The chapter concludes by pointing that biofuel industry performance would be largely determined by the result of the past agrarian politics which often being overlooked by researches on biofuel policy.

4.1. Colonial Policies on Sugarcane and Palm Oil - and the Shaping of Understanding about Their Agrarian Characteristics

Multiple researchers have established the negative implications of colonial agricultural policies for many developing countries including land use change, environmental degradation, poverty and inefficient agricultural production (Bernstein, 2010; Bagchi, 2009; Banaji, 2002). By comparison, however, Indonesia had some positive outcomes in terms of the colonial development of sugarcane and palm oil, particularly with the incorporation of farmers into the production of sugarcane on a large scale. Prior to Indonesia's existence in the 19th century, the Dutch colonial government applied a method of growing these revenue crops.

The Dutch colonial government developed a sugarcane production method that used the native farmers' land without damaging the environment and whilst maintaining a high production yield. Thus, the native farmers could still use their land to plant other crops such as rice and vegetables, while the colonial government could increase its sugar production[2]. Moreover, the colonial government also successfully developed the palm oil industry through the establishment of large plantations, which made Indonesia the largest palm oil producer at that time (Fauzi et al, 2012). However, I argue that it was the successes of the colonial policy on sugarcane where farmers were able to support a large agro-industry which subsequently influenced Indonesian government policy relating to sugarcane and palm oil in the 1970s and 1980s. I then argue that the implementation of policies regarding these crops had profound effects on biofuel policy implementation decades later. Following insights from agrarian political economy, I will show that it is important to understand how colonial policies were successful in making sugarcane and palm oil production into booming industries in order to be able to contextualise and interpret key elements of the contemporary politics of biofuels.

4.1.1. Sugarcane: The Farmers' Crop

The growing demand for sugar in the international market of the 19th century caused the Dutch colonial government to industrialize the sugar industry from 1830 onwards, by integrating sugarcane plantations owned by native Javanese farmers with sugar mills owned by Dutch entrepreneurs under a policy known as the "cultivating system" (see also Van Zanden and Marks, 2012; Knight, 1992, 2018). This policy binds the native farmers with a 21.5-year lease contract allocating one-third of their land for planting sugarcane. Agrarian political economist, Henry Bernstein (2010) argues that

[2] During the colonial period, the Java sugar industry was the second largest sugar supplier in the world (Knight, 2018)

European colonial agrarian policies have caused poverty and famine for native farmers without a positive effect on the agricultural production in the colonies. In the context of Indonesia, the effect of the "cultivating system" on native Javanese farmers was not necessarily different from that in other colonial countries, but the policy did successfully increase sugar production in Java Island ten fold by the end of the 19th century (Mubyarto, 1969; Knight, 2018).

The success of the "cultivating system" was related to the way sugarcane was planted by the Javanese farmers. Sugarcane is a seasonal crop which takes approximately 18 months for one harvest cycle (Mubyarto, 1966). However, the crop could be regrown by using the previous season's stump[3], but such a method would reduce the sugar content significantly (Knight, 2018). Thus, the first sugarcane harvest always yields the highest sugar content and to maintain the high rate of production the current plot must be planted with other crops after the harvesting season to maintain its fertility (ibid). The "cultivating system" enforced by the Dutch colonial government applied this method by requiring one-third of a farmer's land to be planted with sugarcane and after the harvesting season the respective plot could be used to plant other crops such as rice or vegetables, while the new sugarcane crop was planted on another one-third of the farmer's land (Mubyarto, 1966). The effectiveness of the policy was apparent as it maintained both soil and crop productivity and farmers remained the legal owners of their land which reduced the need to establish large sugarcane plantations. Moreover, since the land was still under their control, farmers could utilize the other two-thirds for planting other crops.

[3] This method is called ratooning.

However, in reality the sugarcane crop could occupy up to two-thirds of a farmer's land[4] and most of the economic benefit went to the private Dutch sugar companies (Mubyarto, 1969). Nevertheless, the sugarcane policies imposed by the colonial government ensured that farmers and smallholders became the backbone of this large and successful industry. So, whilst not the biggest island in Indonesia, its production of sugarcane positioned Java as the second largest sugar exporter in the world by the beginning of the 20th century (Knight, 2018). Sugarcane cropping, which facilitated the rotating of crops within a short growing time, enabled farmers to plant sugarcane in their fields on a small scale while maintaining productivity.

In other countries, such as Brazil, agrarian political economists (e.g. Fernandes et al. 2010) note the profound effect on farmers of leasing their land to large sugarcane plantations, where continuous use of land for planting this crop with use of fertilizers degraded the soil quality and meant the farmers were unable to productively use their land after the lease period ended. However, the analysis of the Indonesian case under colonial government policy reveals a much more positive impact on Java's sugarcane farmers, primarily owing to the different agrarian technique that was employed (Knight, 2018). Thus, the Indonesian sugarcane "cultivating system" during the colonial period is considered unique in comparison with common practices worldwide, where sugarcane is grown continuously on land areas that are either owned by sugar plantations or farmers under contract with plantations (Knight, 2018, p.9). The analysis of colonial government policy on Java's sugarcane industry has suggested that institutionalizing crop characteristics into the agricultural system, particularly the growing method, caused sugarcane productivity to increase and

[4] The new sugarcane crop was usually planted in the second one-third plot before the current one-third plot was harvested, leaving farmers with decreased rice production and at risk of famine.

stabilise. This would subsequently influence the Indonesian government's sugarcane policies, as farmers and smallholders were able to supply large industries with sufficient yield and with higher efficiency.

4.1.2. Palm Oil: The Dedicated Crop

Palm oil has a different agrarian policy 'architecture' as compared to sugarcane. For reasons related, in part, to the nature of the crop, the colonial government industrialized this commodity through the establishment of large plantations instead of relying on native farming structures and leasing farmers' land. Palm is a yearly crop and it takes three years for the crop to have its first harvest, with an optimal harvest achieved after the fifth year and a productivity life span of 25 years (Ma'ruf, 2018). Ma'ruf (2018) claims that the crop also needs at least 5,000 hectares of land area to reach an economy of scale sufficient for palm oil plantations to produce crude palm oil (CPO) - which is the principle output of the palm oil industry. This means planting palm oil requires considerable effort and capital as maintenance and labour costs are inevitable, while streams of revenue will only arise after the third year.

Furthermore, the cost of maintaining palm oil for three years before the first harvest could not easily be covered with the income from just one or two harvesting seasons. This means that planting palm oil with recognition of the length of crop productivity is preferable – and this requires a dedicated area of land to be planted with the crop for at least 25 years. As such, it requires a large amount of money in terms of upfront costs and loss of the opportunity to plant another crop for at least 25 years. This precludes rural farmers from planting palm oil as a revenue crop as they would not get immediate economic benefits due to the long harvesting time, as well as the need for dedicated land to optimally benefit from the crop. The cultivation of palm oil is therefore only feasible for capital intensive agro industries. For this reason, at the beginning of 20th century, the Dutch colonial government established palm oil plantations on a large commercial scale instead of implementing similar policies to those used with sugarcane.

They focused on Sumatra Island for palm production as it was less densely populated than Java Island making it much easier for the colonial government to establish large scale plantations. The plantations being established on Sumatra instead of Java Island would influence the industrial performance of palm oil post-colonialism. This difference in geographical location for palm oil and sugar cane production was important for the industries because of events during the Japanese invasion and occupation from 1942-1945 followed by the war of independence until 1949 and domestic political instability (e.g. Islamic state insurgency, the rise of the communist party and its attempted coup) until 1967. For the sugar industry, the period 1942-1949 had been catastrophic as many sugar mills were burned by the Dutch during this period when the Japanese invaded and occupied the island - and sugarcane plantations were left unattended or reconverted to rice fields during the war of independence against the Dutch and the Allies (Mubyarto, 1969; Wahyuni et al, 2009). Conversely, the palm oil industry remained a strong industry as its industrial infrastructure remained relatively intact because Sumatra Island was largely unaffected by the war, while most of the major conflict happened on Java Island. Despite a minor set-back due to the nationalization of palm oil companies after the war for independence (Fauzi et al. 2012; Risza, 1994), Indonesia remained a dominant palm oil producer.

The analysis in this section has built insight into how the material nature of the crops themselves has important implications for agrarian techniques i.e. palm oil is a crop only suitable for industrial scale plantations, while sugar cane can be highly productive for small scale farmers. This, however, is not the only factor in shaping production with the particular nature of the Dutch colonial government's policy on sugarcane helping to establish farmers as the backbone of the sugar industry, which is not the case elsewhere in the world. Understanding this history of production and development, offers insights into subsequent policy developments in the 1970s and 1980s. Centrally, it is suggested here that the success of the colonial government with its sugarcane policy influenced, if not inspired, subsequent Indonesian agrarian government policy. In the next section, I turn to focus on the Indonesian government's policy development, showing how it was shaped by these preceding events.

4.2. Government Alliances with Farmers: Instigating the Undesirable

As explained above, between 1942 and 1967 there was a Japanese invasion followed by a war for independence and political instability in Indonesia. This caused the Java sugar industry to decline but spared the palm oil industry due to its focus on Sumatra Island. I will now discuss agrarian policy related to sugarcane and palm oil after this crucial period which eventually shaped the implementation of biofuel policies in 2006. I will analyse the agrarian policy for each crop separately as each of the policies, despite being potentially favourable to indigenous farmers, has created a different outcome for the relevant crop and the subsequent biofuel industries.

4.2.1. Sugar Commodity Protection Policy: Forging Ineffective Agro-Industry

During the colonial era, the Dutch government made farmers comply with the "cultivating system" policy either willingly or through gentle coercion (see also Van Zanden and Marks, 2012; Knight, 1992). The Indonesian government's agrarian policy in the 1950s and 1960s attempted to replicate colonial policy particularly regarding the land contract system in order to revive the sugar industry. However, the Indonesian government did not have sufficient capacity to enforce the policy as the country was still in a period of turmoil following the civil war.

In this period there was insurgency caused by various groups including the Islamic state and the communist party (the latter of which had almost successfully attempted a coup). The political instability during this period caused an economic crisis that led to a change of President in 1967. Thus, the government was unable to implement the sugarcane policy effectively during this period and farmers refused to cooperate by planting sugarcane. This refusal reflected dissatisfaction with the situation whereby profit from the industry was disproportionately shared between sugar companies and farmers (Mubyarto, 1969). The problem of the disproportionate benefit during the colonial era would later be a government focus in the 1970s with the creation of a protection policy. Essentially, the government attempted to emulate the "cultivating system" by using farmers' land for planting sugarcane, but with some modification of the pricing system so that it would significantly benefit the farmers as well.

In implementing the sugar commodity protection policy, the Indonesian government issued two regulations. Firstly, there was Presidential Decree Number 43 (1971); this regulation provided legal powers for the government to control domestic markets with the purpose of stabilizing domestic sugar prices at a specific level. Secondly, there was Presidential Instruction Number 9 (1975) which was the core of the sugar commodity protection policy. The regulation stated:

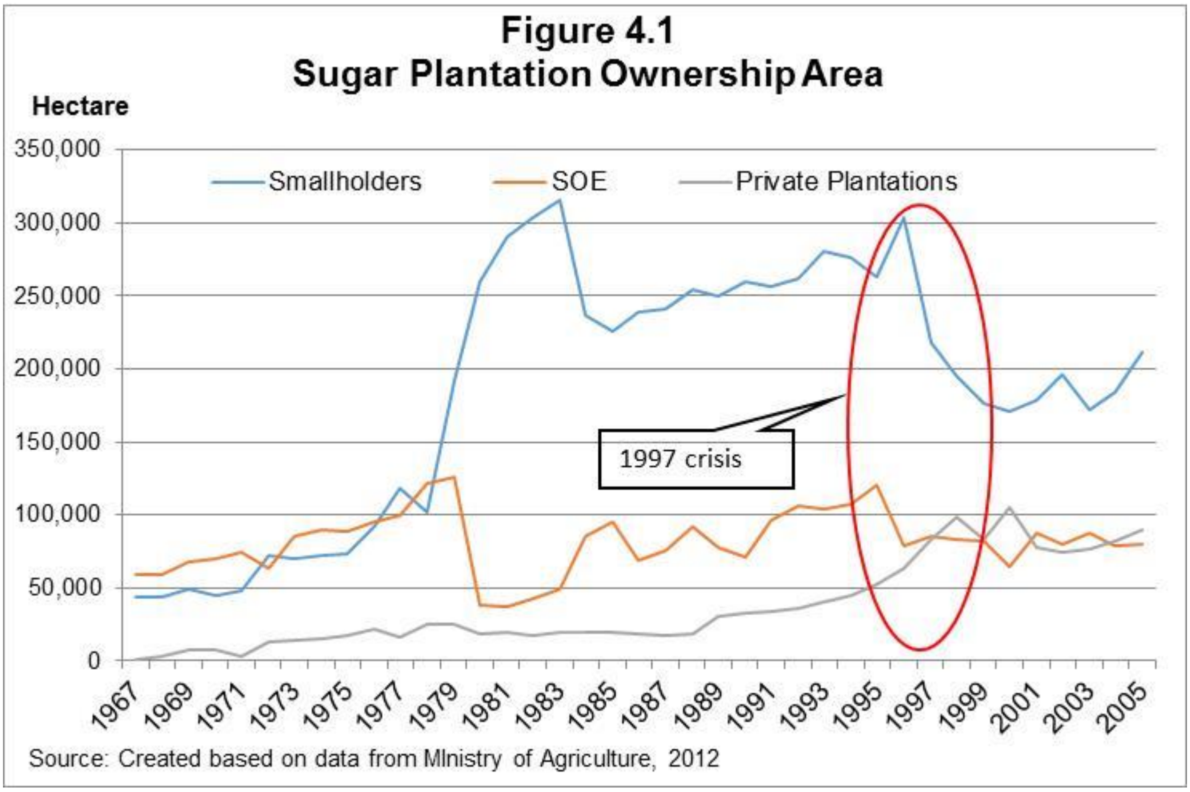
> *"To take measures to shift the cultivation of sugarcane from leased land towards the farmers' land but keep the production increase, so that at the end of Pelita II[5], the entire production of sugarcane is from the farmers' land."*
>
> *(Presidential Instruction Number 9, 1975, First Instruction)*

The excerpt above made clear that the government intended to make farmers the backbone of the sugar industry once again. Sugarcane would be planted by farmers on their land, thus, eliminating the need to establish large plantations using a land lease system. Moreover, The Second Instruction of the regulation stated:

> *"To make the farmers' sugarcane plantations provide high yield, the sugar mills shall act as the leader for the farmers by providing farmers with technical counselling/guidance for commercial cultivation of sugarcane, superior seeds, production facilities, and instructions to get bank loans by utilizing the sugar mills' resources."*
>
> *(Presidential Instruction Number 9, 1975, Second Instruction point b)*
>
> *"To protect the sugar cane farmers from the possibility of adverse bondage and a market dynamic system, the farmers' yields sold to sugar mills have to be paid at a determined value that is profitable for the farmers."*
>
> *(Presidential Instruction Number 9, 1975, Second Instruction point d)*

[5] This is the period of presidency which is 5 years.

Based on the excerpts above, the government required sugar mills to assist farmers in establishing efficient sugarcane plantations. Moreover, the second instruction, the most important aspect of the regulation, laid out that the government would ensure that farmers received a fair price at the harvesting season which was economically beneficial for them. In other words, government would purchase sugar from sugar mills at a fair price and require them to do the same when buying farmers' sugarcane yields. Also, to protect the domestic sugar price from market volatility, the government would apply import controls by buying sugar from overseas markets, where both domestic and imported sugar would be stockpiled and distributed in the domestic market. The implementation of these policies successfully incentivised farmers to plant more sugarcane in their fields and sugar plantations expanded rapidly in the late 1970s and early 1980s (**Figure 4.1**).



At this point, the government had successfully re-established the farmers as the backbone of Indonesia's sugar industry; however, the industry was still unable to return to its past success in terms of production since the country still needed to import sugar to meet its domestic demand (Ministry of Agriculture, 2012; 2015). Although the origins of the policy are uncertain - aside from the link with old colonial policy - it is likely that the government was influenced by the US post-World War agrarian 'new deal' policy. Agrarian political economists (e.g. Friedman, 1993; Bernstein, 2016) have debated the effectiveness of the US 'new deal' policies in increasing agricultural productivity through government purchase of farmers' yields at a fair price and with import control. Furthermore, as Friedman (1993) argues, there was an attempt by the US to replicate this policy in developing countries as part of US foreign policy in order to advance US hegemony over the world food market during the Cold War era.

Political ecologists (e.g. Goodman et al.,1987; Goodman and Redclift, 1989) also argue that protectionist policies in the agricultural sector, in the context of the US 'new deal' policy, stimulated a rise in heavy industrialization through the use of modern equipment such as tractors which increased production yet reduced labour force requirements. However, in the context of Indonesia, the protection policy implemented by the government had a different impact from that in the US and other developing countries since it did not induce heavy industrialization in the sugar industry. Three main consequences resulted from the sugar commodity protection policy which controlled the domestic sugar price. These consequences would subsequently influence the performance of the bioethanol industry decades later.

First, Presidential Instruction Number 9 (1975) only regulated the production, distribution and marketing of sugar and sugarcane without encouraging farmers and smallholders to use modern technology and methods that could increase their production in an efficient way. Several agrarian political economy studies concerning Indonesia's sugar industry have evidenced that the plantations of sugarcane farmers still required intensive labour and used the inefficient method of ratooning[6] which significantly reduced the sugar yield of the crop (e.g. Irawan and Hutabarat, 1991; Rachmat, 1992; Susila and Sinaga, 2005; Ariningsih, 2013).

In his research on *Profil Tebu Rakyat di Jawa Timur* (Sugarcane Farmers' Profile in East Java), Rachmat (1992) explains that the farmers' sugarcane yield was priced based on its weight instead of sugary content (p.48). This meant farmers did not have to bother with the amount of sugar yield in their crops nor any method used to increase the yield, as long as the production cost was cheap and the crop was heavy enough to earn sufficient profit for them. However, this would be problematic for both sugar, and subsequently bioethanol, industries since their output is actually derived from the sugary content of sugarcane. Thus, the protection policy imposed by the government created incentives in the industrial sugar chain that were not conducive to better outputs, since heavier sugarcane does not necessarily mean high sugar content within it, despite a heavier weight being desirable for farmers.

Secondly, the policy had assured both sugarcane farmers and sugar mills that they would receive a fair price from the government without any binding contract. This win-win condition made sugarcane farmers and sugar mills independent entities without the need to be integrated to improve their industrial capacity. This meant sugarcane farmers and smallholders still had full control of their land and the freedom to plant any crops on their plot that brought benefit to them. Thus, the

[6] Although it is considered to be labour effective and considerably cheaper than planting a new crop, ratooning also reduces the sugary content within sugarcane (Knight, 2018).

protection policy created a dependency on government intervention in the sugar sector without actually strengthening the cohesion of the sugar agro-industry. This lack of cohesion, in turn, meant it would be problematic for domestic sugar production if the government rescinded the protection policy, because farmers would be highly sensitive to the dynamics of sugar price changes and they are the dominant stakeholder in the sugarcane sector (see **Figure 4.1**).

Thirdly, the protection policy became an obstacle for the private sector and limited the spread of the sugar industry outside Java Island. Java Island is densely populated with limited available land use for sugarcane plantations whereas other major islands such as Sumatra, Kalimantan, Sulawesi and Papua are sparsely populated and have the potential to expand the sugar agro-industry. However, data from Indonesia's sugarcane statistics in 2015 indicate that more than 60% of sugar plantations were still located on Java Island in 2013 (**Table 4.1**); this statistic had essentially being influenced by the colonial policy which at least resulted on two different impacts.

Impact 1) Since the colonial government only developed the sugar industry on Java Island, farmers here were more likely to accept the planting of sugarcane crops as they could pass the knowledge of sugarcane planting through the generations. Moreover, most of the sugar mills operating on Java Island are those built during the colonial era and still use farmers as their suppliers (GAIN Report, 2008; Low Carbon Support Program, 2013). Thus, it was easier for the number of sugarcane farmers to grow on Java Island as farmers often gathered in cooperative groups to support each other, particularly regarding planting crops for revenue (Rahmat, 1992).

Impact 2) The presidential instruction stipulated that sugar mills were to provide assistance to farmers and this would be easier to do on Java Island as there was existing infrastructure from the colonial era. This meant that sugar companies outside of Java Island required significant investment to establish their production capacity, as they would either have to introduce an unfamiliar crop to local farmers or establish their own plantations. Since the focus of government sugar protection policies was to support small scale farmers by using their land, the establishment of private sugarcane plantations became less of a priority. This created little incentive for private companies to establish an integrated sugar agro-industry as they would require significant investment and the domestic sugar price was controlled by the government affecting their capacities to achieve returns.

Table 4.1
Composition of Sugarcane Industries Ownership and Production in 2013

	Smallholders			**SOE**			**Private Plantations**		
	Area (Ha)	Production (Ton)	Yield (Ton/Ha)	Area (Ha)	Production (Ton)	Yield (Ton/Ha)	Area (Ha)	Production (Ton)	Yield (Ton/Ha)
Java Island	252,307	1,321,975	5.2	51,642	289,234	5.6	1,128	5,303	4.7
Outside Java Island	10,689	57,161	5.3	36,414	135,860	3.7	120,496	765,859	6.4
Total	**262,996**	**1,379,136**	**5.2**	**88,056**	**425,094**	**4.8**	**121,624**	**771,162**	**6.3**

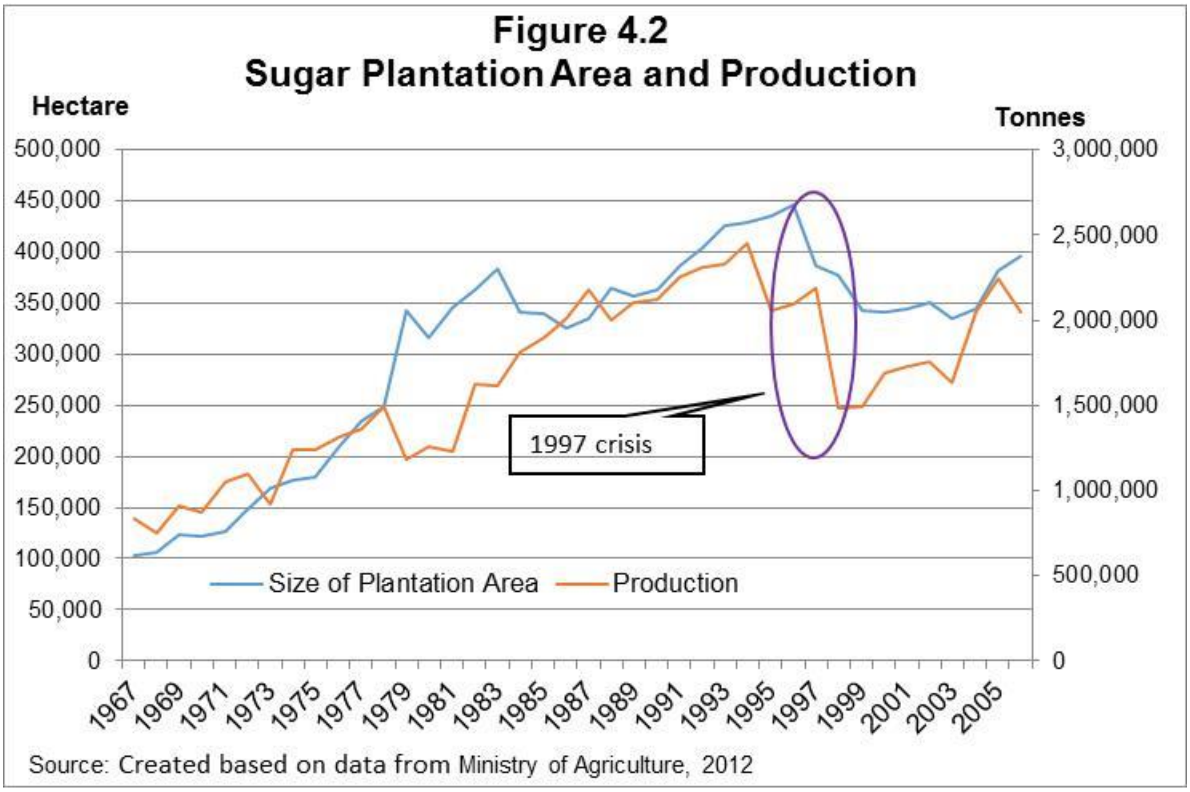
Source: Created based on data from Ministry of Agriculture, 2015

Interestingly, those private sugar plantations in Indonesia established outside Java Island had higher yields than the Javanese smallholders (**Table 4.1 red boxes**). Rachmat (1992) asserts that sugar production quantity depended on factors such as the efficiency of sugar mills, the time taken cutting sugarcane, and the time taken to bring it to the sugar factories (p.48). The high yield of sugar companies outside Java Island implies that they are more efficient at extracting sugar from sugarcane than those on Java Island. The data from the Global Agriculture Information Network (GAIN) Report (2008) mentions that sugar mills on Java Island still use outdated 19th century machinery. The higher sugar production outside Java suggests that private plantations were more organized, efficient and had the capital necessary to invest in machinery necessary to maintain the quality of sugarcane during the harvesting season and ensure a high quantity of sugar as an end result.

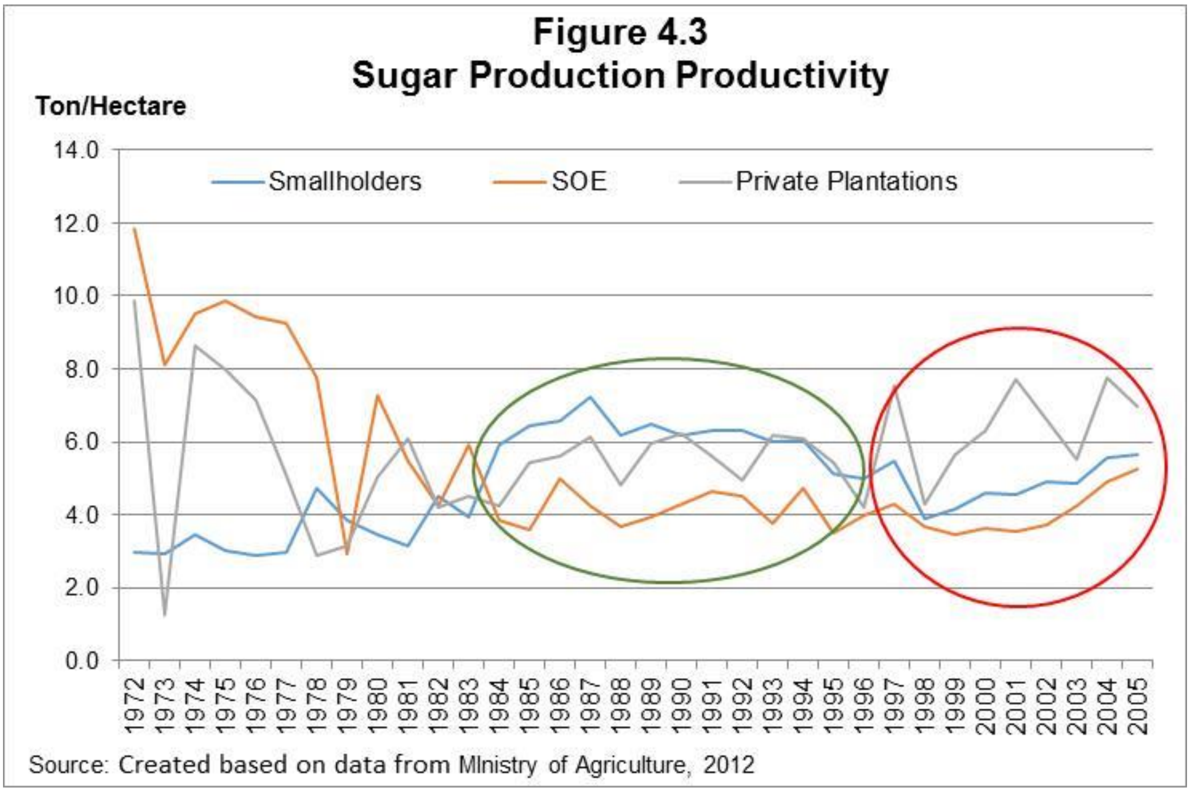
Based on the policy impact analysis discussed in this section, it can be suggested that though the policy had achieved its purpose to share the benefits of the sugar industry with farmers, it has not increased domestic sugar industrial production exponentially as expected at national level (Rachmat, 1992). Instead, the country continued to rely on sugar imports to fulfil domestic consumption requirements. There is an ironic reality concerning the two similar policies implemented at different moments in Indonesia's history. The "cultivating system" during the colonial period successfully integrated farmers within the sugar industry network, with farmers producing sugarcane in accordance with the expectations of the sugar industry - high sugary content sugarcane. Yet, farmers hardly benefited from this colonial policy as profits went to the colonial powers. Meanwhile, the protection policies of the Indonesian government concerning sugar commodities improved the farmers' profits but created the undesirable consequence of an ineffective sugar agro-industry.

The analysis provided here also suggests that private sugarcane plantations could have been more effective in driving agricultural industrialization than the small scale farmers. The 'red boxes' in **Table 4.1** show higher sugar production for private plantations outside Java Island despite having smaller areas than farmers' plantations on Java Island. This indicates that the private plantations are more effectively integrated with sugar mills since they were concerned with the quality of the harvested sugarcane to increase sugar production. It could also be suggested that industrial plantations were more reliable in supporting a large industry, such as sugar and subsequently bioethanol, in comparison with farmers and smallholders, since industrial plantations have the purpose of obtaining the highest quality crop for the industrial recipient. Agrarian political economists (e.g. Friedman, 1995; Goodman, et al., 1987; Bernstein, 2010) argue that governments in developing countries used the instrument of protection policies to increase their agricultural production and farmers' increased wealth was expected to follow. However, the Indonesian government focused on farmers first in its protection policies to eliminate the negative consequences of agricultural industrialization for farmers during the colonial era – however, this resulted in disincentivising the agricultural industrialization of sugar.

The consequences of the sugar commodity protection policy emerged when the government had to rescind the policy in 1997. Friedman (1995) emphasised the high cost of protectionist policies, such as the US 'new deal' policy, on government budgets. The Indonesian government's commodity protection policy for sugar was expensive but the subsidy allocation for this policy was not the biggest amongst government subsidies - the later fuel subsidy had an even greater cost (Ministry of Finance, 2004). Nevertheless, the subsidy allocation for the sugar commodity protection policy had to be terminated to reduce the government's budget expenditure, as well as being part of an agreement with the International Monetary Fund (IMF) - a precondition to receiving financial aid to overcome the 1997 economic crisis (Indraningsih and Malian, 2006). There was a huge consequence for the sugar industry as the sugar price regime changed from government control to market dynamics. As a result, cheap imported sugar flooded the domestic market as domestic sugar was more expensive than imported sugar (Indraningsih and Malian, 2006; Wahyuni et al., 2009). This would subsequently mean that sugar mills, particularly on Java Island, were unable to buy sugarcane from farmers at a fair price and this disincentivised farmers from planting sugarcane which led to a significant reduction in domestic sugar production (**Figures 4.1 and 4.2**).



Nonetheless, private sugarcane plantations maintained their production after the rescinding of the protection policy in 1997. This can be deduced from **Figure 4.1** (red circle) as the area for private plantations remains steady after the crisis period while the farmers' plantation area decreases significantly. This is because private plantations still produced sugarcane whilst farmers gave up and replaced sugarcane with other crops. The data from the Ministry of Agriculture also shows that during implementation of the protection policy, overall sugar production from sugarcane farmers was higher than that from private plantations (**Figure 4.3 green circle**). However, this condition is reversed after the government rescinded the Sugar Protection Policy (**Figure 4.3 red circle**), implying that private agro companies, unlike small scale farmers, had the capacity to adapt to the dynamics of the domestic sugar market, enabling them to maintain production.



Although the private sugarcane agro-industry seemed to be more resilient to the liberal market system, the decades of implementing protection policies hindered the growth of private sugarcane plantations in favour of farmers as shown in **Figure 4.1**. This would eventually lead to the poor performance of the sugar agro-industry after the 1997 economic crisis, since the government decision to rescind the protection policy caused the domestic sugar price to fall and led to a reduction in the demand from sugar mills for farmers' sugarcane - thus reducing sugar production. Consequently, farmers, the main sugar mill suppliers, had to revert their fields to other revenue crops which resulted in a reduction in the size of sugar plantations (see **Figure 4.2**). As will be seen in Chapter Five the poor industrial performance of sugar before the commencement of the biofuel policy in 2006 had profound effects on the bioethanol industry.

The analysis of the sugar commodity protection policy has shown that farmers might be able to plant a short harvest period crop such as sugarcane to provide a feedstock supply for the large-scale sugar industry, but they were not inclined to plant sugarcane owing to the disproportionate share of economic benefits they had received during the colonial era. This resulted in the need for government intervention to assure farmers' receipt of adequate economic benefits from sugarcane production. Nevertheless, the nature of the mechanism for spreading the benefits to farmers had the consequence of forming an inefficient agro-industry with a mismatch between what farmers produced and what the sugar industry needed. The analysis also suggests there is an advantage in having sugarcane plantations under a single companies management rather than relying on farmers; the advantage being that it easier to achieve greater integration between feedstock crops and the sugar mill industry facilitating capacities for adaptation to changes in the sugar pricing regime. Nonetheless, the government policy in sugarcane would have a contrast result with its palm oil counterpart, despite both have the same goal of benefiting the farmers which will be discussed in the next section.

4.2.2. Palm Oil Core Estate Policy: Engaging Farmers with Industrial Crops

The relatively intact palm oil industry infrastructure during the period of war and political turmoil from 1942 to 1967 was an advantage for the industry on Sumatra Island, since it was able to maintain its position as a major global CPO producer with its position slightly reduced from first to second place (Risza, 1994; Fauzi et al., 2012). The Indonesian government recognised the strategic importance of crude palm oil (CPO), which is the main output of the palm oil industry, but also saw that the commodity was predominantly controlled by large plantations with private companies growing rapidly in the sector (**Figure 4.4**). Thus, the government intended to create policies that would facilitate sharing of the economic benefits of the palm oil industry with farmers by implementing PIR-Bun (*Perusahaan Inti Rakyat Perkebunan/* Core Estate and People Plantation) which will be called the Core Estate Policy hereafter (Fauzi et al. 2012).

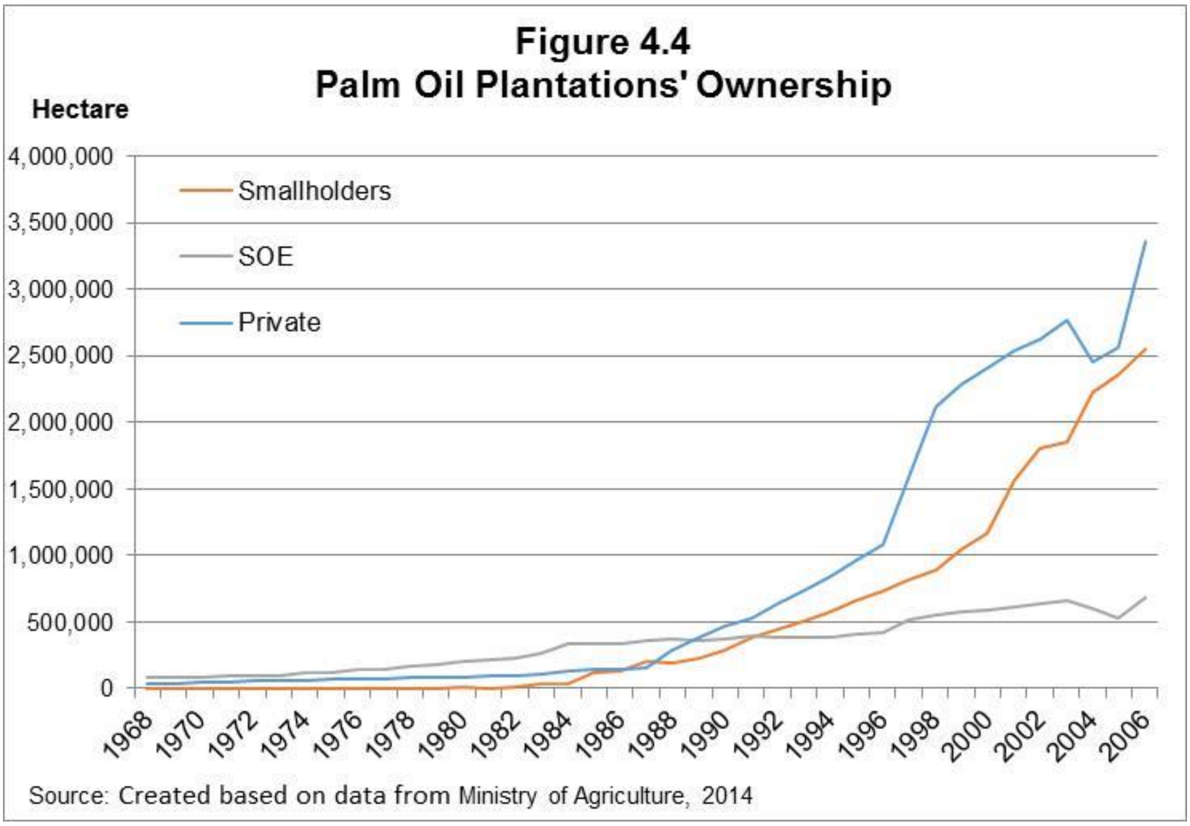


Figure 4.4
Palm Oil Plantations' Ownership

Source: Created based on data from Ministry of Agriculture, 2014

There are two regulations that significantly impacted the success of the Core Estate Policy. Firstly, the government issued Law Number 3 (1972) on Transmigration with the intention of spreading the Indonesian population away from the densely populated Java Island towards the more sparsely populated large islands such as Sumatra and Kalimantan, where the law stated:

> *"Transmigrants are entitled to land and/or agricultural land with land rights."*

(Article 7)

“The land given is at least 2 hectares….. and to be used for productive means of planting agricultural crops.”

(Article 7, Explanatory)

The law stipulated that each migrant should receive two hectares of land to plant crops, with a particular focus on commodity crops (as opposed to subsistence). The Law of Transmigration essentially created the foundation for the second regulation – the Core Estate Policy itself – which was stipulated in Presidential Instruction Number 1, 1986 and was harmonized with the Law on Transmigration. The law stated in the ‘consideration’ section[7] that “this regulation has a purpose to increase the production of commodity crops as well as increasing the farmers’ wealth by integrating the transmigration policy with the Core Estate Policy”. In this presidential instruction document, there are some key statements in the addendum section of the policy document that shaped the agrarian policy for the palm oil industry.

“The core estate pattern is meant to implement plantation development using large plantations as the ‘core’ that help and guide the surrounding community plantations as ‘plasma’ in a mutually beneficial, intact and sustainable system of cooperation.”

(Addendum 1)

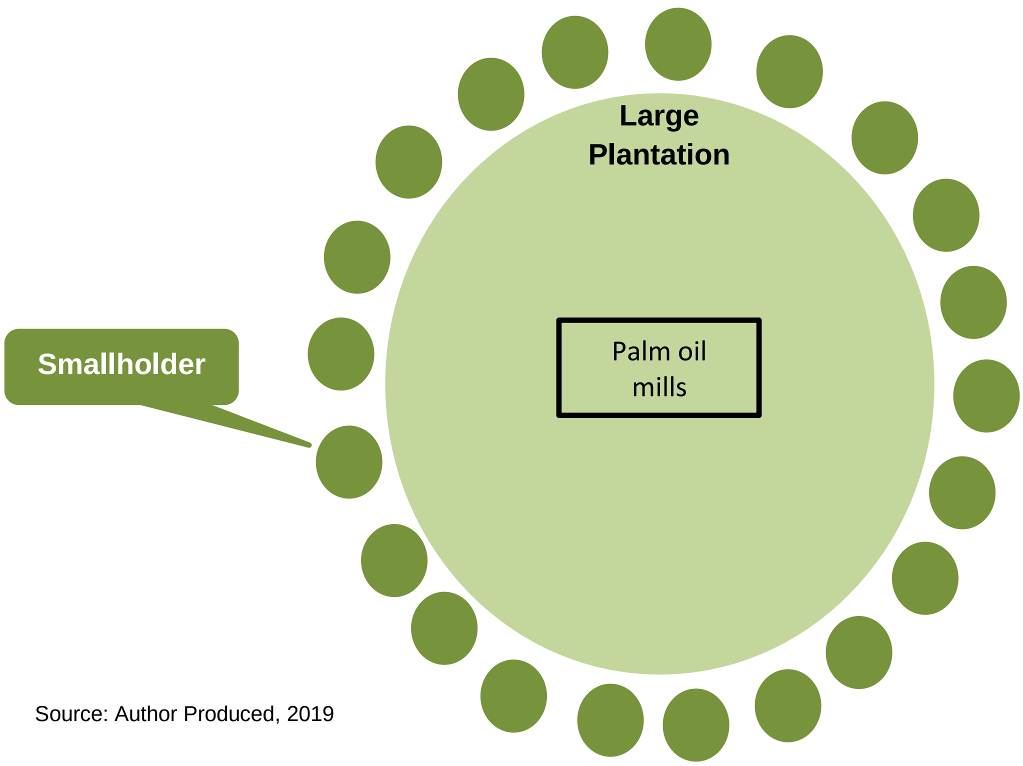
“Participant farmers obtain a house with their land as ‘plasma’ … the size of 2 hectares.”

(Addendum 3 & 4)

[7] All regulations in Indonesia always have their purpose written in the ‘consideration’ part.

The excerpts from the presidential instruction document above give an explanation of the Core Estate Policy, as well as detailing the benefits for farmers who want to participate in the policy. They give insight into how the government intended the development of large plantations as the 'core' estate with such plantations also owning a palm mill and having the capital resources to help 'community' farmers establish 'plasma' or small-scale palm oil plantations. Moreover, they detail how farmers, who were mostly transmigrants, would receive a portion of land that had to be planted with the designated cash crop of palm oil (**Figure 4.5**). Thus, the Core Estate Policy meant farmers were to become deeply involved with palm oil agro industries. Data from the Ministry of Agriculture shows a sharp increase in smallholders' ownership in the palm oil industry beginning in 1988 (see **Figure 4.4**).

Figure 4.5
Scheme of Core Estate Policy



Source: Author Produced, 2019

The regulation also provides the legal justification for the plantation company to be the ‘core’ plantation as shown in **Figure 4.5** as well as regulating the way the company finances the farmers. The regulation stated:

> *“The companies that can become the ‘core’ plantation are both state and private plantation companies”.*
>
> *(Addendum 5)*

> *“Funding for the construction of ‘plasma’ is carried out by ‘core’ companies which will then be taken over by government banks and other banks approved by the Bank of Indonesia (Central Bank) at the time of submission of ownership of the ‘plasma’ estate to participating farmers”.*
>
> *(Addendum 6 point a)*

Based on the above excerpts, farmers who had been given land by the government would receive assistance from palm oil plantation companies which included technical support and funding to establish their smallholdings or ‘plasma’. This would ensure the farmers success in growing a palm oil crop while still being able to meet their rudimentary needs (which were usually met by planting rice on their land. Furthermore, the regulation also set out the farmers obligations should they decide to plant palm oil, as stated:

> *“Participant farmers are obliged to:*
>
> *a. pay for the replacement of the ‘plasma’ plantation costs, for which they are given long-term soft credit by the government bank;*
>
> *b. carry out the cultivation of the plantation according to the guidance of the core company;*

c. sell their yield to the company on terms and reasonable prices that are mutually beneficial."

(Addendum 8)

Although farmers would eventually have to return the cost of establishing their 'plasma', they would not have difficulty in terms of payment since they could repay only once their smallholding was ready and was generating sufficient income for them. Furthermore, they did not need to find a buyer for their yield since the 'core' plantation would purchase it at a fair price. This ensured farmers received streams of revenue from their 'plasma'. Thus, the Core Estate Policy has allowed farmers to benefit from the palm oil industry – a benefit which was usually enjoyed exclusively by large plantations. Nonetheless, the most important part from this policy was the way plantation companies benefited from this policy which essentially created a mutual symbiosis between them and farmers. The regulation stated:

"The cost of developing a plasma plantation that is taken over by a government bank and other banks approved by the Bank of Indonesia consists of:

1. the cost of developing a 'plasma' plantation from the preparation stage up to the time of its submission to farmers including interest, whose amount is calculated based on unit costs plus overhead costs and management services of 15%, which is determined and reviewed annually by the Minister of Finance and the State of National Development Planning / Chair of BAPPENAS after hearing the opinion of the Minister of Agriculture;

2. the unit cost interest as referred to in number 1 is set at 16% and can be reviewed by the government."

(Addendum 6 point d)

Based on the above excerpt, all expenses for aiding farmers would be returned to the plantation companies along with a 15% management fee that becomes the company profit.

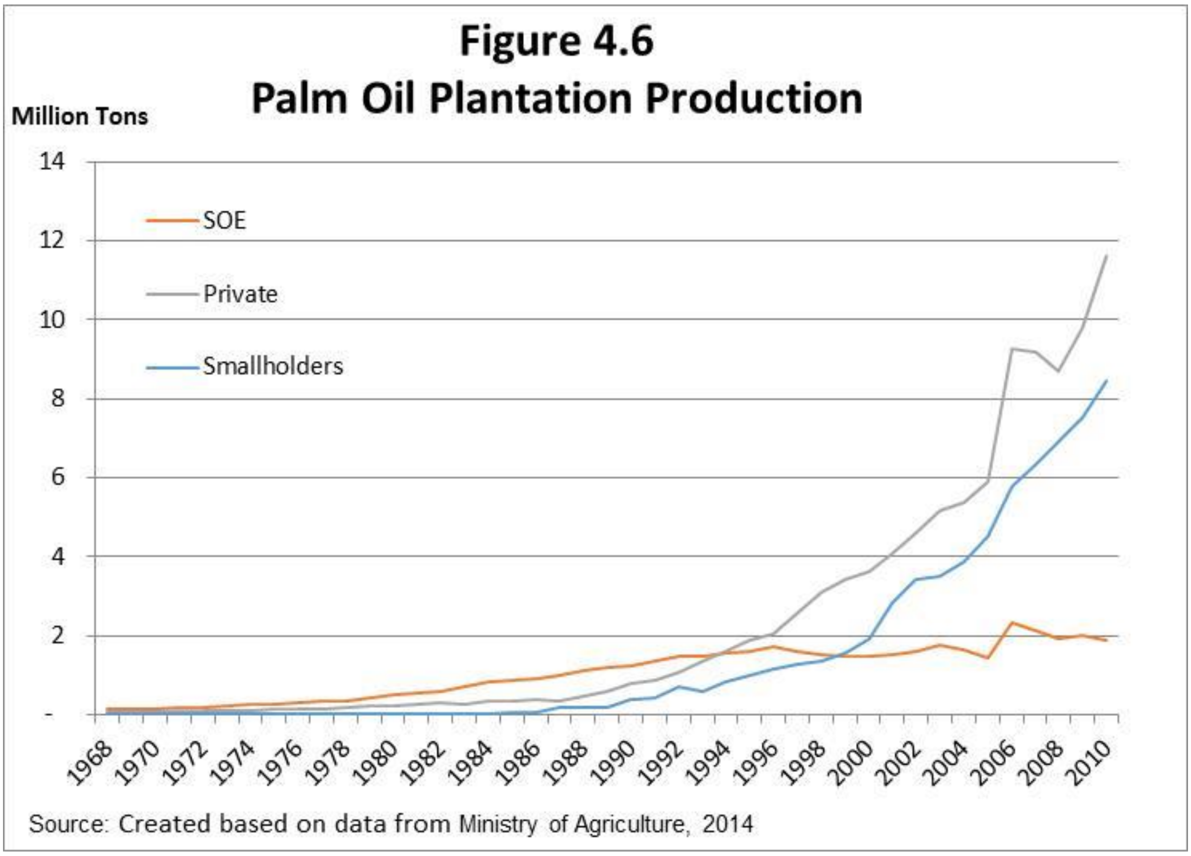
Based on the excerpts from both points a and d in addendum 6 and addendum 8, the plantation companies received three benefits from the Core Estate Policy. Firstly, they could increase their CPO production without the need to expand their plantations. Secondly, farmers had to sell their yields - fresh fruit bunches - to palm oil companies at a price cheaper than CPO in the international commodity market (R22 Personal Interview, May 2017). This was advantageous for palm oil companies since farmers essentially became their workers but without any employee-employer obligations, such as providing employee benefits and increasing salaries, or facing fears of employees going on strike. Thirdly, although plantation companies were required to provide assistance, including funding, to their farmers, the regulation stipulated that they would receive their money back plus interest and a management fee. Thus, the Core Estate Policy became a lucrative opportunity for palm oil companies as they could increase CPO production at very little cost, which resulted in a rapid increase in palm oil production (**Figure 4.6**).

Picture 4.1
Palm Oil Fresh Fruit Bunches

Source: Paspimonitor.or.id, 2018

Picture 4.2
Palm Oil Mills

Source: private documentation, 2017



Agrarian political economists and political ecologists (e.g. Goodman et al., 1987; Goodman and Redclift, 1989; Goodman and Watts, 1994) argue that by implementing protectionist policies for certain agricultural products, governments in developing countries enabled large industrial investment resulting in large scale production and 'appropriation' of farmers as part of an industrial network. Although the Indonesian government did not implement protection policies in the palm oil agro industrial sector, the Core Estate Policy alongside the transmigration policy that preceded it, followed the same trajectory where farmers become critical within the palm oil industrial chain.

Thus, the government's Core Estate Policy created a new class of farmers who grew only cash crops on their land. However, this did not necessarily mean that agricultural industrialization was happening on farmers' smallholdings. There was a significant yield difference between industrial plantations and farmers' plantations as two respondents stated:

> *"Companies could earn yields up to 5 tons/hectare while smallholders are just 2-3 tons/hectare."*
>
> *(R22 palm oil company representative, April 2017)*

> *"Companies regularly do replanting (palm tree), but not smallholders and we also utilized agronomics (science of soil management and crop production), (high quality) seeds and fertilizers."*
>
> *(R15 palm oil company representative, May 2017)*

Both excerpts above suggest that plantation companies have the capability to optimize their yields by applying methods of crop maintenance, while farmers have limited capability to do so. This is likely to reflect farmers' dependence on plantation companies in terms of providing technical assistance to manage their smallholdings. During this period, plantation companies were also focused on expanding (see Figure 4.4 above), suggesting that they were allocating resources to expand their own plantations, instead of being fully reliant on palm oil farmers as happened with the sugar industry.

This is also emphasized by the statement by R22 above on the stark difference between the yields produced on industrial plantations and farmers' plantations. His statement suggests that palm oil companies had the capacity to perform at industrial scale which resulted in higher yields, whilst this is a limitation for smallholders. For instance, a palm oil company would have capital to pay more labourers to conduct more regular crop maintenance than farmers and smallholders. Thus, it can be surmised that though the Core Estate Policy did successfully support the expansion of both palm oil plantations owned by farmers and those owned by large companies, it did so without significantly improving farmers' production capacity. This meant that government agrarian policy in the palm oil sector actually strengthened the hegemony of large agro industries and positioned farmers as the companies' extensions, since their existence was entirely dependent on the plantation companies.

This can be characterised, then, as appropriation (Goodman et al. 1987), as farmers' were engaged in planting cash crops (in this case palm oil) but without being subject to agricultural industrialization, despite their yields becoming part of an industrial input. Agricultural industrialization happens as farmers are encouraged to be more efficient in their production through utilizing machinery and chemical fertilizers to increase their yields for industrial input, instead of being directly consumed as food. In the context of Indonesia's palm oil industry, though the crop itself is characterized as an industrial crop, the farming practices were not subject to other processes of industrialisation.

Where companies were able to call on the latest technologies and make investments in fertilizers facilitating efficiency in managing palm oil crops, and especially in maintaining productivity, farmers and smallholders were not. Farmers and smallholders were unable to plant palm oil in an industrial manner, for example using high quality seeds, replanting unproductive trees, and applying fertilizer regularly, as they did not have the capital to do so. Thus, farmers could earn economic benefit from planting palm oil but they were still underperforming in comparison to plantation companies. This highlights the greater efficiencies in production that the industrialized companies were able to achieve compared to the smallholders, although it should be recognised that farmers' engagement did help to increase the total production of CPO at the national level.

The Core Estate Policy implemented by the Indonesian government seems to resemble the cultivating system policy of the colonial government with both policies relying on farmers to supply large scale industries. Yet, this analysis also suggests that it was ultimately impractical for farmers to plant an industrial crop, such as palm oil, as their limited capital resources resulted in lower yields than those produced by large companies. Despite being successful in sharing the economic benefit of the palm oil industry with farmers and smallholders, large plantations have ultimately become the real beneficiaries of the Core Estate Policy. The large-scale plantations have thrived due to their efficiency and crude palm oil has become cheap and abundant. This has important consequences for the development of biofuels, in particular the advanced state of the palm oil industry within Indonesia meant it was well placed to meet growing demand as biofuels took hold and new demands were constituted. The analysis thus far has focused on the historical policy and its different policy outcome for sugarcane and palm oil whereby the former becomes an unintegrated agro-industry and the latter becomes the opposite. The next section discusses the way the outcome of past agrarian policy influences contemporary biofuel policy implementation.

4.3. The Farmers' Crops: The Government's Intention to Pursue a Biofuel Policy

On the 2nd of July 2006, the President of Indonesia, *Soesilo Bambang Yudhoyono,* made a media statement during a cabinet meeting which discussed a biofuel policy initiative:

> *"Farmers can return to their land. Dried lands can also be processed. Those who only have one or two hectares (of land) can use it to develop biofuel raw materials."*
>
> *(Soesilo Bambang Yudhoyono, July 2nd, 2006, Suara Merdeka Online July 3rd 2006)*

In his statement, the President indicated that the development of the biofuel industry should involve farmers and smallholders as feedstock suppliers. Again, a government preference for rural farmers and smallholders to be biofuel suppliers instead of large agro companies is expressed. A further statement by the President identified biofuel as necessary to increase industrial agro capacity, with Indonesia rich in crops such as palm oil, jatropha and sugarcane (Banjarmasin Pos, July 3rd 2006). The statement indicates a government expectation that the biofuel industries would use such crops as their feedstock. In this context, sugarcane was to be used as bioethanol industry feedstock while palm oil and jatropha were designated for biodiesel feedstock.

The Minister of Industry also made a media statement related to biodiesel feedstock crops:

> *"To date, the most economical biofuel raw material is jatropha oil, while CPO is exported and used cooking oil is also limited."*
>
> *(Fahmi Idris, July 2nd, 2006, Suara Merdeka Online July 3rd 2006)*

In his statement, the Minister of Industry acknowledges CPO, the main output of the palm oil industry, as a potential biodiesel feedstock, but his statement also reveals some hesitation in involving palm oil (an export commodity) as a feedstock for the biodiesel industry. He also asserts that CPO should retain its status as an export commodity rather than becoming feedstock for the domestic biofuel industry. His statement is connected to the President's statement and there is an expectation that farmers (not the established large palm oil industry) will form the backbone of a new biofuel industry. The latter of these statements also makes reference to jatropha, indicating that this was clear that the crop of choice for biodiesel feedstock, while sugarcane was to become the preferred crop for use in bioethanol.

Several commentators have noted that the government decision to select these crops appeared to have been influenced by a group of prominent academics (engineers) from ITB (*Institut Teknologi Bandung*), a notable university in Indonesia (Amir et al., 2008; Afiff, 2014; Fatimah, 2015). These engineers had been working with biofuels including conducting an experiment using a car fuelled by pure jatropha oil (Sinar Harapan, 29 June 2006). Afiff's (2014) and Fatimah's (2015) studies of Indonesia's jatropha initiative demonstrated that these ITB professors had been powerful advocates of biofuel production since 2000. They claimed that producing jatropha for biofuel feedstock purpose can be conducted by people living in rural and remote areas which could help their economy (Afiff, 2014). This is because jatropha has more advantages over other type of crops such as drought resilience and can be planted in less fertile land using less fertilizer (Amir et al, 2008; Afiff, 2014). Thus, these advocates of jatropha framed biofuels as the 'silver bullet' to solve the government's problems relating to energy security and economic development, as well as creating an opportunity to increase rural farmers' income and address rural poverty providing jatropha is used as feedstock. As Fatimah (2015) asserts:

> *"The political instability, due to rise of the national oil price, 'forced' the national government to include Jatropha in their activities as a silver bullet to solve multiple problems through one program."*
>
> (Fatimah, 2015)

As discussed above, the sugarcane agro-industry in Indonesia was dominated by farmers and smallholders due to the protection policy on sugar commodities in the 1970s and 1980s, an approach that was damaged by the rescinding of this policy in 1997 causing most farmers to revert their farm plots to growing other revenue crops. Thus, implementing a biofuel policy focused on particular crops (i.e. sugarcane and jatropha) appealed to the government as it would encourage farmers to plant sugarcane for bioethanol feedstock and many farmers particularly on Java Island were familiar with the crop. Jatropha was an unknown crop for Indonesian farmers, however, the advocates of this crop had promoted it during seminars and workshop with government officials, as well as through an alumni network which included government ministers and political allies of the President. As such, jatropha emerged as the rising star where government officials and political elites including the President himself, were eager to promote it to farmers as a biofuel crop heralded by its advocates (see also Fatimah, 2015). The Indonesian government came to see biofuel - and these specific crops - as a solution not only to overcome emergent issues of energy insecurity associated with the decline of oil production, but also to increase farmers' welfare by making them a key element (as feedstock suppliers) in the biofuel industry.

The government's positioning on biofuel production as a panacea for economic and welfare problems is not unique (see Chapter Two). Although biofuel proponents (e.g. Mol, 2007; Huber, 2008) highlight the prospects of biofuel production to increase the income of rural farmers, multiple studies from political ecology and agrarian political economy (e.g. Ariza-Montobbio et al., 2010; Amir et al. 2008; Oliviera et al., 2017; Wilkinson and Hererra, 2011) have shown that the biofuel industry around the world tends to rely on large agro-industry as its supplier, rather than rural farmers. In the context of Indonesia, several studies (e.g. Amir et al. 2008; Afiff, 2014; Fatimah, 2015) have detailed the failure of jatropha initiatives with farmers unable to sell jatropha to the biofuel industry despite enormous government attempts to promote the crop as a biofuel feedstock.

Multiple studies using the lens of political ecology (e.g. Neville and Daugverne, 2012Fernandez et al. 2010; Obidzinsky et al., 2012; Holander, 2011) have also shown that biofuel policies have often impoverished smallholders and rural farmers, and instead created a lucrative business opportunity for large agro companies. Thus, the benefits of biofuels have been shown to flow to large companies instead of farmers and smallholders. Though existing studies offer some insight into the processes shaping this outcome for biofuel industries, there are significant gaps within the understanding of how and why the Indonesian government's attempt to ensure farmers were the backbone for the new biofuel industry ultimately failed. In particular, the importance of crop selection is a neglected area of analysis that I argue had specific significance within the Indonesian context given the historical trajectories of agrarian development.

With the failure of jatropha as an alternative to palm oil, sugarcane and palm oil came to be used as feedstock for the bioethanol and biodiesel industries respectively, where the former was 'chosen' or favoured by the government (as above), the latter was favoured by the biodiesel industry. In the context of biodiesel, then, there was a contradiction between the government's intentions and the preference of the biofuel industry. Palm oil, which was a crop initially undermined by the government as a biodiesel feedstock, became the preferred feedstock for biodiesel producers, rejecting the government's preference for jatropha. One respondent stated this clearly:

> *"This (biofuel) industry previously used jathropa as feedstock but could not get enough routine volume on an industrial scale and it was expensive because farmers bought seeds for 15 to 20 thousand (rupiah) per kilogram and farmers sold to the industry at the same price because they wanted to get a quick return for their money despite their yield being only 20% at most. If a kilo of jatropha seeds is priced at 10 thousand rupiah a kilo, then the price will be 40 thousand rupiah/litre for feedstock only, so we can't make a profit."*
>
> *"So, my machine is ready but there is no raw material. I'm looking for used cooking oil, but it's also hard to find used cooking oil. The one in front of me is palm oil."*
>
> *(R1, Biofuel industry representative, May 2017)*

The excerpt above indicates the disappointment of the respondent concerning jatropha. As a biodiesel company owner, he was willingly to follow the government direction of using jatropha as the feedstock for his biodiesel factory. However, a problem emerged – the price of jatropha was too expensive for his company - causing the biodiesel price to become uncompetitive against its fossil fuel rival. Thus, he explains the need to find an alternative to replace jatropha to produce biodiesel.

The Core Estate Policy implemented since the 1980s had made palm oil an integrated industry producing CPO efficiently, cheaply and abundantly which matched with the expectations of the biodiesel industry for its input material.

Moreover, the main objective of players in the biodiesel industry was profitable business as various respondents state.

> *"We were aware that this (government interest on developing biofuel) was an industrial event for entrepreneurs."*
>
> *"When we used palm oil, we could directly supply Pertamina without any government intervention. It was all pure business negotiation.*"
>
> *(R1, Biofuel industry representative, May 2017)*
>
> *"We used CPO as feedstock since we're aiming for green energy and our analysis showed that using CPO is profitable."*
>
> *(R22, Palm oil industry representative, May 2017)*

The excerpts above imply that the biofuel policy is seen as a business opportunity by respondents and using palm oil in their factories would serve their purposes, which were to generate profit. This meant that the biodiesel industry would ultimately ignore the government's preference for using farmers' crops as feedstock because the most important aspect for them was finding a feedstock that would make their businesses profitable.

Added to this, the success of palm oil companies to attract biodiesel producers did not seem to be replicated for sugarcane production and bioethanol producers. The government's decision to implement a biofuel policy and select sugarcane as the primary bioethanol feedstock was expected to re-motivate farmers who used to plant sugarcane to plant this crop again to supply the production of bioethanol. However, the government used only a market mechanism whereby the increased demand for bioethanol was expected to increase the demand for its up-stream product, sugarcane. This has proved to be ineffective since the Sugar Protection Policy in the past has made sugar industry as unintegrated industry which influence the market performance of this industry and made sugarcane industry unable to fulfil the government expectation in developing bioethanol. This would be discuss in depth in Chapter 5.

Table 4.2
FG Bioethanol Consumption Actual VS Needed (litres)

Year	Gasoline Consumption	Targeted Blending Rate	FG Bioethanol Needed	Domestic Bioethanol Production		Actual Consumption
				Capacity	Actual	
2006	16,000,000,000	3%	480,000,000	10,000,000	300,000	50,000
2007	17,000,000,000	1%	170,000,000	13,000,000	1,000,000	660,000
2008	19,000,000,000	1%	190,000,000	243,000,000	1,200,000	1,200,000
2009	22,000,000,000	1%	220,000,000	273,000,000	1,720,000	1,260,000
2010	23,000,000,000	3%	690,000,000	273,000,000	N/A	650,000

Source: Created based on data from GAIN Report, 2010 and 2011

The data from the GAIN Reports in 2010 and 2011 confirm that bioethanol production is far below demand and production capacity which indicates that bioethanol industries are unable to obtain a sufficient quantity of feedstock to meet bioethanol market demand (**Table 4.2**). The gap between bioethanol demand and production would seem to be paradoxical since bioethanol factories are already reliant on sugar mills for their feedstock supplies (GAIN Report, 2007) and sugar mills have already been supplied by sugarcane farmers. This suggests that the implementation of the biofuel policy is insufficient to incentivise farmers to plant sugarcane. Such a condition could result from the protection policy implemented in the 1970s and 1980s that created industrial disintegration between sugarcane farmers and sugar mills. This could also suggest that policy intended to benefit the farmers does not necessarily creates positive outcome for the whole agroindustry which gives profound effect for the biofuel policy implementation. Thus, there is a strong correlation between the outcomes of agrarian policy, for certain crops, as implemented in the past and the performance of the biofuel industry that uses the respective crop. There are other potential factors contributing to the problems of feedstock supply for the bioethanol industries, such as government policies and industrial competition within the bioethanol industry; this will be discussed in Chapter Five.

4.4. Summary and Conclusion

Based on the discussion in this chapter, it is evident a key intention of the Indonesian government's agrarian policies for both sugarcane and palm oil has been to increase farmers' wealth. The primary intention of the government's past agrarian policies has thus followed a similar trajectory to its contemporary biofuel policies, prioritising small scale farming and particular crops in different ways. In particular, the government attempted to promote farmers' crops of sugarcane and jatropha as feedstock for the bioethanol and biodiesel industries respectively. However, I argue that the historical agrarian policies on sugarcane and palm oil implemented in the 1970s and 1980s have shaped contemporary biofuel policy implementation, seeing it develop in ways counter to the government's expectations and aims. These policies were in turn shaped by the history of colonial agrarian policy.

In the context of bioethanol, the colonial government's policies on sugar production had ensured that farmers would grow the high-quality sugarcane needed by the sugar industry. The Indonesian government's focus in implementing sugar commodity protection policies addressed the negative impacts on farmers associated within unfair distributions of benefits but failed to understand the method of crop planting and seasonality that made the colonial policy a success. This caused inefficiency in the sugar agro-industry where farmers failed to produce sugarcane in the necessary quality and quantities, which influenced the associated industrial performance of farmer's crops and subsequently the choices of the bioethanol industry.

In the context of biodiesel, the Dutch colonialists seemed to understand that the resources and scale of production associated with smallholders, made them unsuitable for the industrial cultivation of palm oil. However, through the Core Estate Policy, the Indonesian government again sought to make farmers central to the palm oil industry and proportionately share its economic benefits. The Core Estate Policy successfully achieved the government's intention yet resulted in the private palm oil plantations gaining hegemony over the commodity, whilst creating farmers as mere dependents. The well-established nature of the industry influenced the preference for the biodiesel industry to use palm oil as its feedstock, ignoring the government promotion of jatropha. Subsequently, biodiesel industries would influenced the government's plans concerning palm oil which will be discuss in depth in Chapter 7.

Hence, the past agrarian policies for sugarcane and palm oil have culminated in different outcomes, particularly regarding their level of industrialization, with major implications for their use within biofuel production. The analysis presented in this chapter has contributed to our understanding of how historical agrarian policy relating to specific crops proves an important aspect in the implementation of biofuel policies. This is because agrarian policy implementation in the past has affected the performance of these different crops, which has eventually had impacts on the performance of the biofuel industries that ran counter to the aims and contemporary policy of the Indonesian government. The analysis also suggests a strong correlation between the results of agrarian policy implemented in the past with the current performance of biofuel industry.

Although the historical background of agrarian policy for the respective crops affects the performance of biofuel industries, it is still insufficient to fully explain the formation of agro-fuel alliances, particularly the way that large agro-companies have bonded with biofuel industries. There are factors such as the different industrial characteristics of bioethanol and biodiesel, as well as the politics of Indonesia's biofuel market, that shape and reshape biofuel policy implementation and it these factors that will be discussed in Chapter 5.

Chapter Five

The Politics of the Biofuel Market:

Reshaping Indonesia's Biofuel Policy

This chapter attempts to answer the question: how has the biofuel industry and its market structure reshaped contemporary Indonesia's biofuel policies? I argue that the biofuel industrial and market structure for both bioethanol and biodiesel, alongside government policies in the biofuel market, are key factors influencing the success or failure of biofuel development in Indonesia. The lenses of political ecology and agrarian political economy are used to understand the underlying politics of Indonesia's biofuel market, as well as to increase our understanding of the importance of both the market and industrial structure within the further development of biofuel systems and biofuel-agro alliances.

Multiple studies using the lenses of political ecology and agrarian political economy have identified biofuel policies as a source of conflict between communities in the plantation feedstock area (Peluzo, 2008; Daugverne and Neville, 2010; Obidzinsky et al. 2012), or between the plantation companies and the local communities (Fernandes et al., 2010; Neville and Daugverne, 2012; Neville, 2015) due to the disproportionate benefits each stakeholder receives. Moreover, biofuel policies have been identified as a cause of deforestation as a result of land competition to increase the production of feedstock for the industry (Fernandes et al., 2010; Varkkey, 2012; Lima et al., 2011). However, these previous research studies have only focused on the consequences resulting from biofuel policy implementation and pay little attention to the processes involved in the biofuel industrial and market structure that shape these outcomes. Although there are studies that show that market competition was involved in securing biofuel feedstock such as sugarcane, corn and palm oil and that this resulted in an increase in food prices (e.g. Gillon, 2016; Oliviera et al., 2017), these studies only focus on biofuel industrial input and provide insufficient understanding of the importance of the market structure for biofuel industries. This has resulted in limited insights into the importance of market structure and its role in shaping the current place of biofuel industries in the Indonesian agro-fuel alliance.

I will focus my analysis on the bioethanol and biodiesel markets, since the different industrial structures of bioethanol and biodiesel mean that each biofuel has its own unique market structure. I will also discuss Indonesian government policy and regulations relating to the biofuel market as these influenced industrial, as well as domestic, market performance for bioethanol and biodiesel. In so doing, I will utilize interview data and observational data from the field research conducted in 2017, along with data from secondary sources in the form of media interviews, government reports and policy documents. The data will be discussed in the context of previous research that focuses specifically on the bioethanol and biodiesel industries in Indonesia.

Understanding the biofuel market and its industrial structure is important as many case studies on biofuels in other countries have shown that respective government attempts to implement such a policy have caused the domestic biofuel industry and its market to flourish (Gillon, 2016; Wilkinson and Herrera, 2011) and even created overseas demand for both biofuel and its feedstock (Pye, 2011; Hollander, 2011). However, in the context of Indonesia, biofuel policy implementation has created an inverse effect on the domestic biofuel market. This effect is vividly seen in the case of bioethanol as both the industry and its market have not grown (see also **Table 4.2** in Chapter 4, Section 4.3). Moreover, biodiesel has also shown a similar outcome, where the industry is growing but the domestic market is not.

This chapter is composed of three sections. The first section analyses the bioethanol market to understand its complexity, particularly as a result of the agrarian policy involving its main feedstock, sugarcane (discussed in Chapter 4). The second section analyses the biodiesel market to understand the relationship between the biodiesel industry and its feedstock supplier - the palm oil companies. It further examines the interrelations between palm oil companies and the Indonesian government, which I argue became critical in creating a lasting bond between the biodiesel industries and palm oil. The final section analyses the contemporary biofuel market as a whole and discusses the links between biofuel industries and fuel consumers, the government and fossil fuel companies.

5.1. The Fragmented Bioethanol Market

Agrarian political economists (e.g. Hollander, 2011; Wilkinson and Herrera, 2011; Gillon, 2010) have discussed how government policies that establish targets for bioethanol use in domestic markets have created new markets for the respective product and seen large industries consolidating their capital to profit from the policy. For example, case studies in Brazil (Hollander, 2011; Wilkinson and Herrera, 2011) and the US (Gillon, 2010) have shown that biofuel policy implementation has encouraged large agro companies to consolidate their business in an attempt to control the market for bioethanol and its feedstock, eventually creating agro-fuel alliances. In these studies, while there is some consideration of the bioethanol market structure, this is not discussed in depth since there is already a strong agro-industry that provides crops suitable to produce bioethanol. However, in the context of Indonesia, the market structure is of greater importance since the feedstock industry for bioethanol - sugarcane - is dominated by farmers and smallholders (discussed in Chapter 4). As will be discussed further in this section, government implementation of the biofuel policy did not encourage bioethanol industries to consolidate their business and become the main actors in the bioethanol market with its respective feedstock. This highlights additional factors within the bioethanol market and its industrial structure that fundamentally impacted the failure of the bioethanol industries to consolidate their business to profit from the biofuel policy in the Indonesian context.

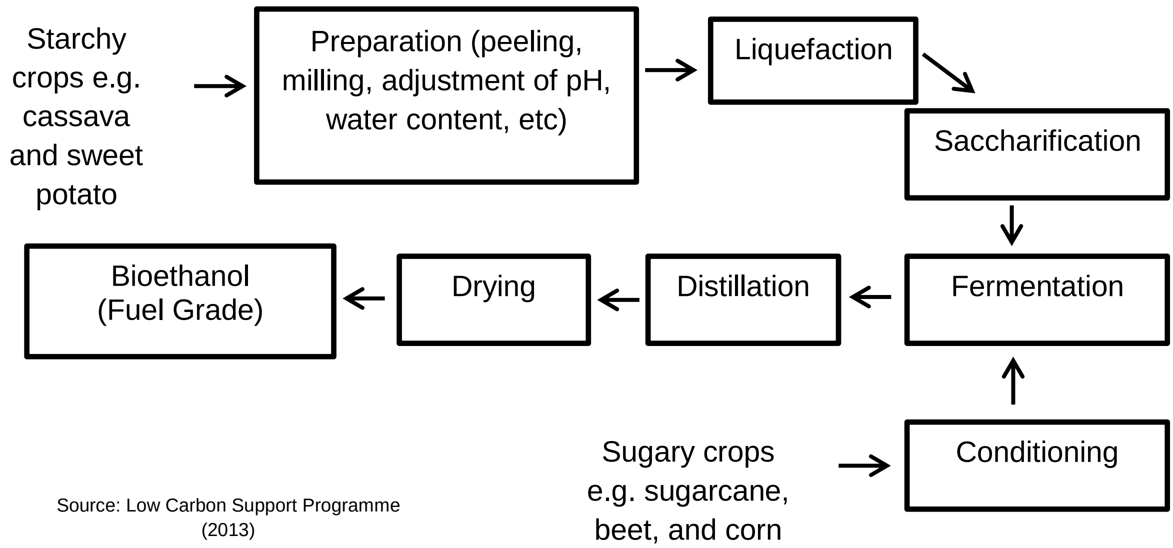
The idea of a fragmented market is commonly found in the field of marketing; market fragmentation is defined as a diverse market consisting of multiple actors where each actor has a variety of needs and wants but cannot influence the market (Winds, 2011). This means that in a fragmented market, there is no particular buyer who can influence the sellers of particular goods to sell their products to the respective buyer. For most governments, biofuel policy implementation is expected to consolidate the market since such a policy creates a huge demand for bioethanol. For example, in the Brazilian case study large sugarcane agro companies focused their business to produce bioethanol or to maintain sugar production but also integrate with the bioethanol industries (e.g. Hollander, 2011; Wilkinson and Herrera, 2011). The current analysis has found that in the case of Indonesia, instead of experiencing rapid growth, production of bioethanol has experienced stagnation due to the fragmented market in both bioethanol and its feedstock markets. This is an area overlooked by many agrarian political economists and political ecologists, despite its relevance to understanding the success or failure of the respective industry.

In the Indonesian case, there are two areas where market fragmentation is occurring - thus, significantly hindering the growth of the bioethanol industry. Firstly, there are difficulties in obtaining feedstock and, secondly, there is the fact that bioethanol itself is produced and marketed as a commodity and not as a fuel.

5.1.1. The Challenge of Securing Feedstock

Bioethanol is made from the fermentation of sugary material, where the source of this material can be either sugar content crops such as sugarcane, corn and beet or carbohydrate content crops such as cassava and sweet potatoes (Patil and Patil, 2017). The Low Carbon Support Programme (2013) published by the Ministry of Finance asserts that the choice to use sugar content crops as bioethanol feedstock would be a good option, as the process would be simpler than the carbohydrate one which requires a saccharification process before fermenting the sugar obtained to produce bioethanol (**Figure 5.1**).

Figure 5.1
Bioethanol Production Process



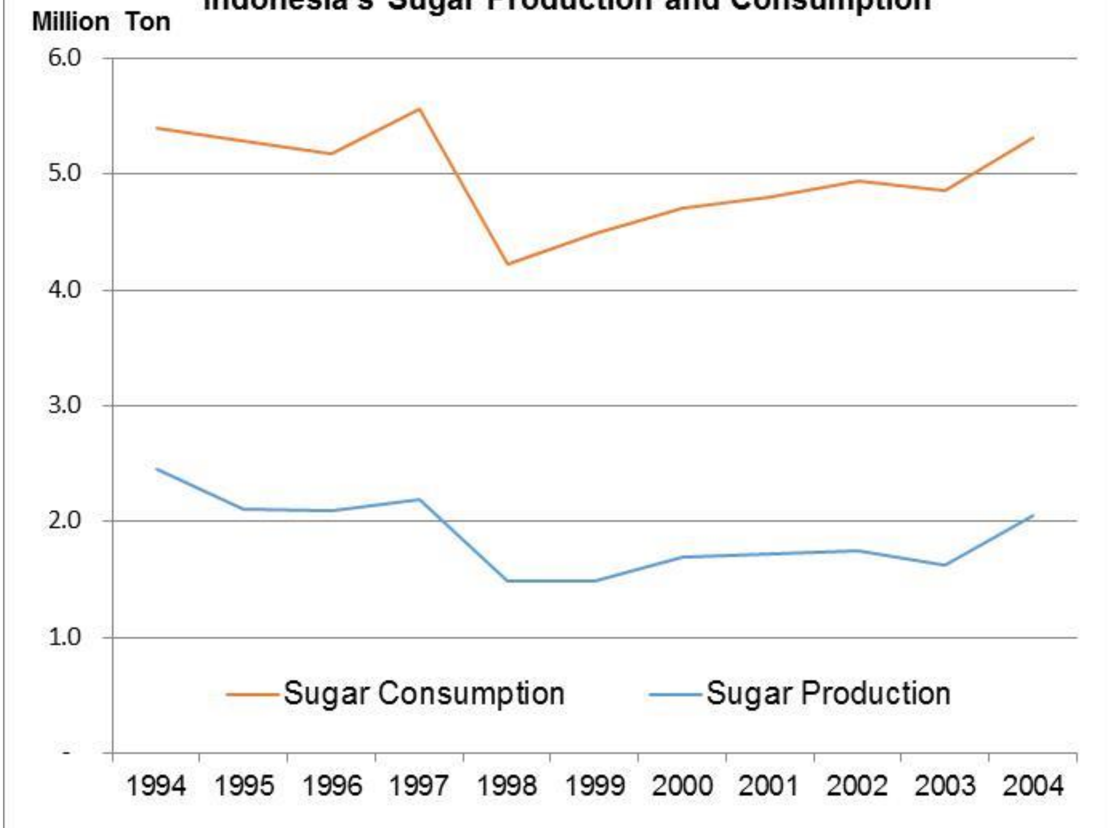
Source: Low Carbon Support Programme (2013)

The above figure highlights how sugary crops have greater advantages than starchy crops in terms of producing bioethanol, as the former have a shorter production process than the latter. Thus, using sugary content crops would be more efficient and potentially make the bioethanol product cheaper than if using starchy crops. This is because bioethanol factories using sugary crops would require smaller investment and have lower operating costs than those using starchy crops. This could explain why bioethanol industries in the US and Brazil use corn and sugarcane respectively as their feedstock (Gillon, 2016; Hollander, 2011).

In the context of Indonesia, the government's decision to select sugarcane as the bioethanol feedstock would be considered as a good decision based on **Figure 5.1** and it is a crop well known to local farmers – which means it offers further appeal given that one of the government's intentions for developing biofuel was to use farmers as feedstock suppliers. However, analysis in Chapter 4 has shown the underlying problems in the sugar agro-industry including Indonesia's status as a sugar importer and the ineffective sugar agro industries resulting from the sugar commodity protection policy in the 1970s-1980s. Indeed, there was a considerable gap between domestic sugar demand and consumption prior to the implementation of the biofuel policy (**Figure 5.2**).

Thus, using sugar, the main product of the sugarcane industries, as the raw material to produce bioethanol would inevitably escalate this gap and cause conflict between food and fuel production. Fortunately, bioethanol production does not necessarily have to use sugar from sugarcane processing. Chemical engineers have asserted that bioethanol can be produced by using the by-products of the sugar industry such as bagasse and molasses since these materials, particularly molasses, still contain significant sugary content (e.g. see Patil and Patil, 2017; Wardhani and Pertiwi, 2013; Nurdyastuti, 2005; Clifford, 2018).

Figure 5.2
Indonesia's Sugar Production and Consumption



Source: Indraningsih and Malian, 2006

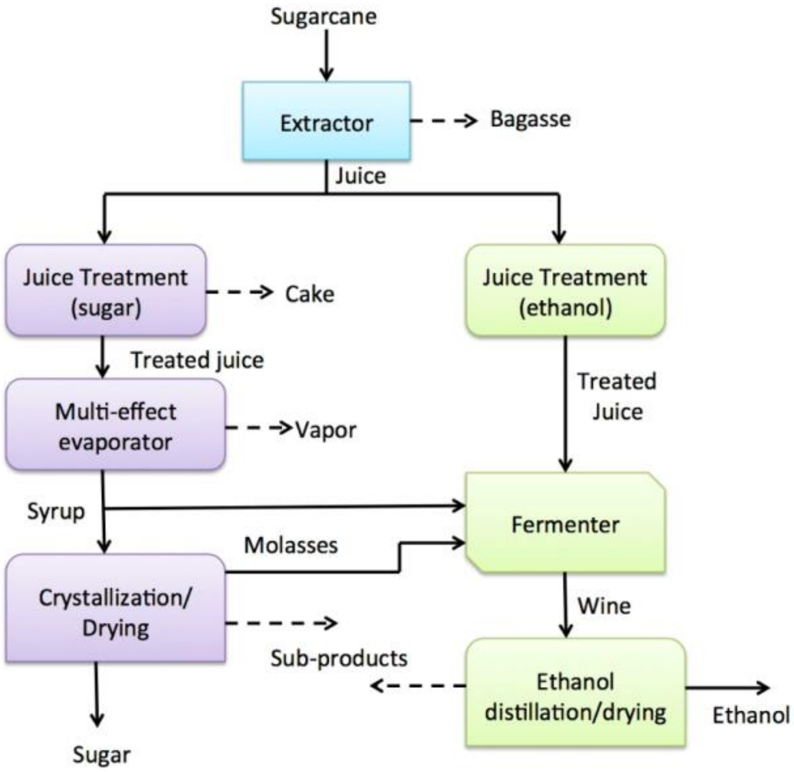
Picture 5.1
Bagasse

Source: DiscoveryUK, 2018

Picture 5.2
Molasses

Source: www.sparetimesupply.com, 2018

Figure 5.3
Sugarcane Processing to Sugar and Bioethanol



Source: Clifford (2018)

Molasses is a thick, dark brown juice obtained from raw sugar during the refining process, while bagasse is the dry pulpy residue after the extraction of the juice from sugar cane (**Pictures 5.1** and **5.2**). Lavarack's (2003) study on sugarcane-based bioethanol processing methods found that molasses is the material that yields the third highest bioethanol outcome (where the highest is the juice followed by sugar) (see **Figure 5.3**). Based on Clifford's (2018) description of sugarcane-based bioethanol processes, processing sugarcane will produce juice along with bagasse as a by-product and the juice can be used to produce either bioethanol or sugar (**Figure 5.3**).

Wilkinson and Herrera (2011) stated in their study on sugarcane-based bioethanol in Brazil that: *"The sugarcane sector is still quite fragmented with some 350 mills, 230 dual purpose and over 100 exclusively for ethanol"* (p.177). Based on **Figure 5.3**, mills exclusively producing bioethanol can be considered as those that process sugarcane solely to produce bioethanol (as represented by the green-white boxes). Establishing a dedicated sugarcane plantation for bioethanol production could be highly productive, since it can optimally use all sugary content in sugarcane processing - particularly the juice which Lavarack (2003) asserted could yield the highest bioethanol result. Meanwhile, dual-purpose mills can be considered as those that process sugarcane into sugar and use its by-product molasses to produce bioethanol - as represented by the purple-white boxes in **Figure 5.3**. It could be suggested that all sugar mills mentioned in Wilkinson and Herrera's (2011) study are industrially integrated with bioethanol industries and the feedstock market is not fragmented, since sugar mills are either producing just bioethanol or producing both sugar and molasses where the latter is used by the bioethanol industries as their feedstock.

The bioethanol industry in Indonesia is also supplied by sugar mills as stated in the GAIN Report (2006):

> *"No ethanol is being produced from corn, sugarcane or sugar beets….(bioethanol) plants use molasses from local sugar refineries as the raw material."*
>
> *(Global Agriculture Information Network, 2006 page 4)*

The excerpt above suggests that although the bioethanol industry obtains molasses from sugar mills, no crops have been planted exclusively to produce bioethanol. This indicates that there is no industrial integration of sugarcane plantations with the bioethanol industry in Indonesia. This, I argue, indicates the impact of the agrarian policy in the sugarcane sector implemented from the 1970s to the 1990s (discussed in Chapter 4), since the policy created an ineffective agro-industry where there was no integration between sugarcane farmers, as the major players in the sugar sector, and sugar mills. This would become the bioethanol industry's primary disadvantage and also the root of the fragmentation in the bioethanol feedstock market as suggested by a local media source in Indonesia:

> *"Some sugar factories in Indonesia use molasses for the raw material for making bioethanol. But, sugar factories generally sell molasses to intermediary traders and producers of acetic acid and monosodium glutamate (MSG)."*
>
> *(merdeka.com 1 August 2006)*

The excerpt above confirms that there is hardly any industrial integration in the bioethanol production line since sugar mills are at liberty to sell their by-product (molasses) to any buyers. Molasses is not generally used for direct consumption in Indonesia and its main consumers are industries such as the food industry (to produce monosodium glutamate - MSG) and the bioethanol industry. Moreover, the excerpt also shows that there are various buyers in the molasses market, though none of them can influence the sugar mills to sell molasses to a particular actor in the process. This is the first fragmented market within the bioethanol system, as there is more than one actor who needs molasses for a specific purpose. This also means that bioethanol industries need to compete with other consumers of molasses in order to secure feedstock for their production process.

In a media interview, one official from a state-owned sugarcane plantation company stated:

> *"Molasses export happens if the overseas price is better than the domestic and as long as the local price is the same as the global price, it is guaranteed that there will be no export (of molasses)."*
>
> *(PTPN IX official, merdeka.com, 1 August 2006)*.

Based on the excerpt above, it is suggested that molasses will not be sold overseas unless there is a large discrepancy between the domestic and overseas prices. However, the data from the BPS-Statistics Indonesia (**Table 5.1**) suggest otherwise.

Table 5.1
Export and Import of Molasses

Year	Export		Import		Domestic Sugar Price (USD/Ton)
	Ton	Value (USD/Ton)	Ton	Value (USD/Ton)	
2005	227,704	85.19	52,861	152.06	295.5
2006	553,278	89.43	47,014	155.29	382.0
2007	525,191	90.78	54,635	147.80	349.9
2008	945,858	76.59	60,056	185.16	358.1
2009	496,342	124.53	80,289	234.64	412.8
2010	468,907	145.76	105,994	188.88	580.9
2011	528,667	116.15	57,028	197.06	691.1
2012	388,112	115.56	102,437	200.25	589.8

Source: Based on the data from the BPS-Statistics Indonesia, 2015

Based on the BPS-Statistics Indonesia (2015), molasses is exported abroad in high quantity despite having a relatively low value. The import quantity (tonnage) for the same product is much lower than the export tonnage, although its import value (USD/Ton) is higher than the export value. This shows a fragmented commodity market for molasses where sugar mills prefer to sell molasses abroad and the domestic bioethanol industry is unable to influence the domestic demand for molasses to prevent sugar mills from exporting it. The main priority for sugar mills is price - and the price for sugar is significantly higher than the price for molasses (BPS-Statistics Indonesia, 2015) which suggests that the mills would rather focus on their main output (sugar) and use their by-product (molasses) merely for additional revenue.

This results in a fragmented bioethanol industry where sugarcane farmers and sugar mills are at liberty to produce and sell their outputs based on their own private gains. Although the statistical data provided by the BPS-Statistics Indonesia (2015) is unable to detail the motives behind why the sugar mills export molasses, it provides an indication of the severe impact on the unintegrated bioethanol industry. Sugar mills are not obliged to supply the bioethanol industry with molasses, and thus, prefer to sell molasses to receive a cash revenue. A more thorough investigation is essential to understand the decision of the sugar mills to sell their by-product overseas rather than supplying the domestic bioethanol industry – however, this is beyond the scope of this thesis.

The analysis in this section has shown that even before the government implemented biofuel policies, the molasses market was fragmented due to the protection policy for sugar commodities implemented in the 1970s-1990s that created an ineffective sugar agro-industry. This meant the domestic bioethanol industry faced challenges in securing feedstock and as a consequence had to make their production highly efficient to ensure profit from the business. This, however, does not necessarily mean that bioethanol production would be cheap, as the data from the BPS-Statistics Indonesia (2015) suggest that bioethanol producers would need to pay a high price for molasses as they could not access the product from a domestic source. This suggests that acquiring customers for bioethanol is a top priority for bioethanol producers rather than producing the product on a large scale and then waiting for someone to buy it. Thus, the bioethanol industry will only produce and sell its product base on customer demand (in terms of quantity and quality). Despite this, bioethanol customers are still unable to bargain on the price offered by the bioethanol industry since the industry has to buy expensive raw material to produce bioethanol.

To understand the impact of the difficulties faced by the bioethanol industry in securing feedstock (and thus their abilities to align with the intentions of biofuel policy), it is important to understand the process of producing bioethanol. In reality there were industries needing bioethanol for their production line regardless of the implementation of the biofuel policy. This would eventually impact on the bioethanol customers' preference to purchase domestic bioethanol as the product can be use both for fuel or non-fuel purpose as will be discussed in the next section.

5.1.2. Bioethanol as a Commodity: Between Industrial and Fuel Purposes

Figure 5.1 and **Figure 5.3** show that once a sugary material such as molasses and the juice enter the fermentation stage, bioethanol will result. Moreover, in each stage of the process of making bioethanol, the material's chemical property from the previous stage does not change other than increasing the purity. The result of the fermentation process (see **Figure 5.1**) is a low concentrate of bioethanol (<40%), while the distillation process can increase bioethanol purity up to 99.5% (Nurdyastuti, 2005; Patil and Patil, 2017). This percentage of bioethanol is often called industrial grade ethanol or industrial ethanol (IE) which is commonly used by food industries, pharmaceuticals and other industries that need IE in their industrial processes (GAIN Report, 2007; Siahaan et al., 2013). Furthermore, the processes to produce bioethanol are relatively easy to conduct at any scale - including home industry (Patil and Patil, 2017).

However, IE is unsuitable for use in an internal combustion engine such as within a car or bus since it contains more than 0.5% water which could corrode the vehicle's engine (Nurdyastuti, 2005; Siahaan et al., 2013). Thus, in order to prevent this corrosion effect, bioethanol purity should be more than 99.5% which is called fuel grade ethanol or fuel ethanol (FE) (Nurdyastuti, 2005; Patil and Patil, 2017). To achieve this, another process is undertaken called drying (see **Figure 5.1**). Patil and Patil (2017) assert that this is expensive and requires huge investment by a bioethanol producer to build a drying facility. The Head of APBI (*Asosiasi Perusahaan Bioethanol Indonesia*/Indonesian bioethanol companies association) also made a media statement regarding the difficulties of producing FE:

> *"Those who are able to supply such levels (99.5%) are only large companies that have sophisticated factories, not home-scale."*
>
> *(Supriyanto, BBC Indonesia, 28 October 2012)*

The excerpt above shows that FE can only be produced by large bioethanol factories as the investment needed to build drying facilities is too expensive for small scale refineries[8]. In summary, there are two types of bioethanol that can be produced by large bioethanol factories - industrial grade ethanol (IE) that can also be produced by small scale refineries and fuel grade ethanol (FE) that only large bioethanol refineries can produce. Moreover, bioethanol factories that already produce IE would also be able to produce FE if they installed drying facilities.

[8] APBI members are small scale bioethanol producers (As stated by Supriyanto, The Head of APBI, interviewed by BBC Indonesia, 28 October 2012).

Based on the data from the GAIN Report (2006), there were two bioethanol producers in Indonesia that could produce FE and both used molasses as feedstock before the government implemented biofuel policies. However, the report also stated that the two factories capable of producing FE did not produce it for fuel purposes, but for other industries which needed pure ethanol within their production line such as the food, pharmaceutical and cigarette industries. This means FE is not exclusively used for fuel purposes, since certain industries use high purity bioethanol (fuel grade ethanol) as an input material for their products.

Meanwhile, the data from the Low Carbon Support Programme (2013) mentioned that there were 11 bioethanol factories in Indonesia prior to implementation of the biofuel policy. This suggests that most of the existing bioethanol factories may not have had the drying facilities to purify bioethanol since there was only market demand for IE. However, those that could produce FE were producing it to supply industries that purchase FE for non-fuel purposes. This means that before the biofuel policy there was already demand for fuel grade bioethanol, but for industrial purposes. This shows that the bioethanol market was already fragmented before the implementation of the biofuel policy, since the bioethanol industry could produce ethanol for any consumer who demanded it. Moreover, the data from the Low Carbon Support Programme (2013) suggests that there were no industrial consumers that dominated the bioethanol market. Thus, the government's implementation of the biofuel policy was expected to increase demand for fuel grade bioethanol which could potentially stimulate bioethanol producers to produce FE to meet the demand for bioethanol as a fuel.

However, instead of an increase in the production of bioethanol (FE), the analysis in Chapter 4 (Section 4.3) has shown that FE production for fuel purposes decreased despite the increase in its potential demand. Moreover, the GAIN Report (2010) also indicates a reduction in demand for fuel ethanol from biofuel customers (p.3). Thus, the implementation of the biofuel policy did not promote consolidation of the bioethanol industry and did not increase FE production to meet any increasing demand. Instead, it created further competition between industrial consumers requiring FE within their production line and those using it for fuel. Moreover, the former consumers had more suppliers since they could use any purity level of bioethanol (including high purity - 99.95%) as a desirable feedstock. Meanwhile, the latter consumers could only use bioethanol with a purity level of 99.95% which is produced by just two bioethanol factories. Thus, industrial competition increased which was disadvantageous for those using FE for fuel purposes.

As discussed above, it would be difficult for the bioethanol industry to reduce FE prices due to challenges in securing feedstock that prevents the industry from production on a mass scale. This is suggested to be a key reason for bioethanol companies to produce below their production capacity (as shown in the GAIN Report, 2011, p.8) as a means of reducing their expenditure. However, industries such as food, pharmaceuticals and cigarettes, need bioethanol (including FE) at any cost (high or low) since this cost would be part of their production costs and would not create competition for their final product since other companies most likely use FE in their own production lines. For example, a pharmaceutical product just has to compete with other pharmaceutical products and both producers are likely to use bioethanol in their production chains. Nevertheless, there would be difficulties for bioethanol consumers who use the product for fuel purposes, since the price of bioethanol is compared with the price of fossil fuels, making this a determining factor for the FE consumer.

Biofuel policy implementation was expected to increase demand for FE and stimulate bioethanol producers to consolidate their businesses to meet the biofuel industries demand. However, in reality, the bioethanol market, which was already fragmented prior to the biofuel policy, remains fragmented, since there is no one consumer that dominates the market and causes the bioethanol producers to prioritize production for a specific consumer type. Moreover, bioethanol customers using FE for transportation purposes will only buy FE if it competes financially with the cost of fossil fuels. Meanwhile, bioethanol producers will only want to produce FE if buyers are willing to pay their set price. This suggests that biofuel policy implementation alone is insufficient to influence bioethanol companies to produce bioethanol on a large scale for fuel purposes. Instead, other factors relating to the market context for bioethanol must also line up.

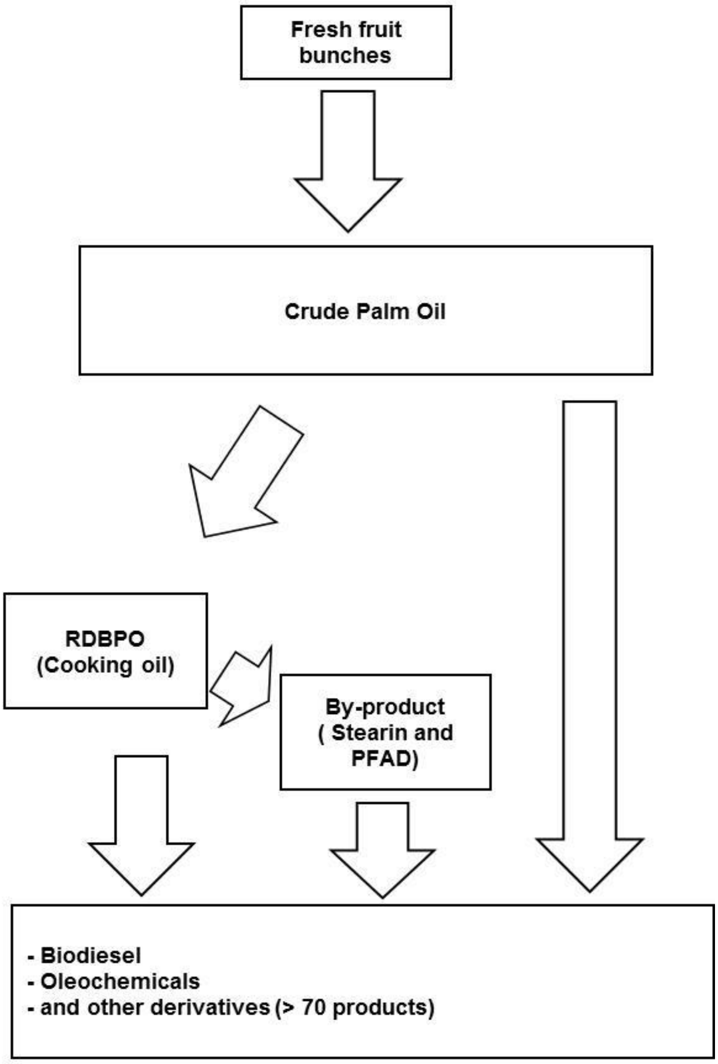
The analysis in this section has shown that bioethanol (FE) is a multi-purpose commodity with a fragmented market within its production system. The fragmented market for bioethanol feedstock has proved an obstacle for the industry to secure molasses to produce bioethanol. As a result, bioethanol producers do not have the ability to mass produce FE. Moreover, since fuel grade bioethanol is in high demand by fuel and non-fuel consumers, another fragmented market has emerged where no consumers are able to significantly influence the bioethanol producers to focus on supplying a certain type of consumer. This is due to a price mismatch between producer and consumer expectations for fuel ethanol. Consumers of ethanol for fuel purposes compare the price of bioethanol with the price of its fossil fuel counterpart, whilst producers decide the price based on their actual production costs. The fragmented market became a huge barrier as regards achieving the bioethanol policy target. Indeed, the production of FE for fuel purposes was stagnant until it finally ceased in 2010 (as will be discussed in depth in Chapter Six). However, the fragmentation is only found in the bioethanol market – not the biodiesel market - although there is a similarity as regards the implications for the domestic market. This will be discussed in Section 5.2 below.

5.2. Biodiesel: The Market for Palm Oil Industries

As discussed in Chapter 4, the agrarian policy on palm oil crops influenced the biodiesel industry's preference for using this crop as their feedstock, rather than jatropha - a crop favoured by the government. Moreover, domestic production of palm oil in 2006, when the government started the implementation of biofuel policy, exceeded 17 million tons and has continued to increase, whereas domestic consumption is stable at approximately 5 million tons per year (Ministry of Agriculture, 2014; Ministry of Energy and Mineral Resources, 2016). This means there was a significant surplus of palm oil that could potentially become the feedstock for the domestic biodiesel industry.

Palm oil-based biodiesel is essentially a derivative of crude palm oil (CPO) called fatty acid methyl ester (FAME). In Indonesia, CPO is mainly used to produce RDBPO (refined deodorized bleach palm olein) or cooking oil. FAME can be produced by processing CPO, the by-product of producing cooking oil and the cooking oil itself (**Figure 5.4**). This makes FAME, a palm oil-based biodiesel, a product that can be flexibly obtained either directly from CPO or from its derivative products.

Figure 5.4
Palm Oil Production Process



Source: Based on data from Minal (2014)

The biodiesel production process suggests that the biodiesel industry would have an industrial advantage if it could secure the by-products from producing cooking oil, since these products are cheaper than CPO as mentioned by respondent R22:

> *"PFAD and stearin prices in the market are approximately 75% of CPO for PFAD and 95% of CPO for stearin."*

(R22, palm oil company representative, May,2017)

Unlike bioethanol where producers need to compete just to secure the feedstock material, biodiesel producers have the advantage of abundant feedstock without having to compete with other industries. As suggested by the excerpt above, a close connection with the large palm oil industry was therefore beneficial for the biodiesel industry as it could utilize the by-products from producing cooking oil at a much cheaper price than CPO. Nevertheless, the palm oil industry did not produce biodiesel prior to the government implementing its biofuel policy in 2006. Respondent R1 confirmed:

> *"There were only three biodiesel companies in 2005 and none of them were owned by palm companies."*
>
> *(R1, biofuel producer representative, April 2017)*

The excerpt indicates a lack of industrial integration between biodiesel companies and palm oil companies at this time. Instead, producing biodiesel was suggested to be against the industrial interests of palm oil producers. The excerpt below is from respondent R22 who entered the biodiesel business before he joined the palm oil company where he is currently working. He stated that the palm oil company sought biodiesel business not as a profitable business opportunity but rather as a means for cost efficiency to reduce daily operating costs.

> *"In 2006, I started a biodiesel business in collaboration with PTPN IV[9]"*.
>
> "*Biodiesel is produced not for sale but for internal use by a palm oil company (PTPN IV) because the HSD (High Speed Diesel) requirements for PTPN IV are quite a lot for transportation, generator sets, etc"*

[9] PTPN IV is a state-owned palm plantation company.

(R22 palm oil company representative, May, 2017)

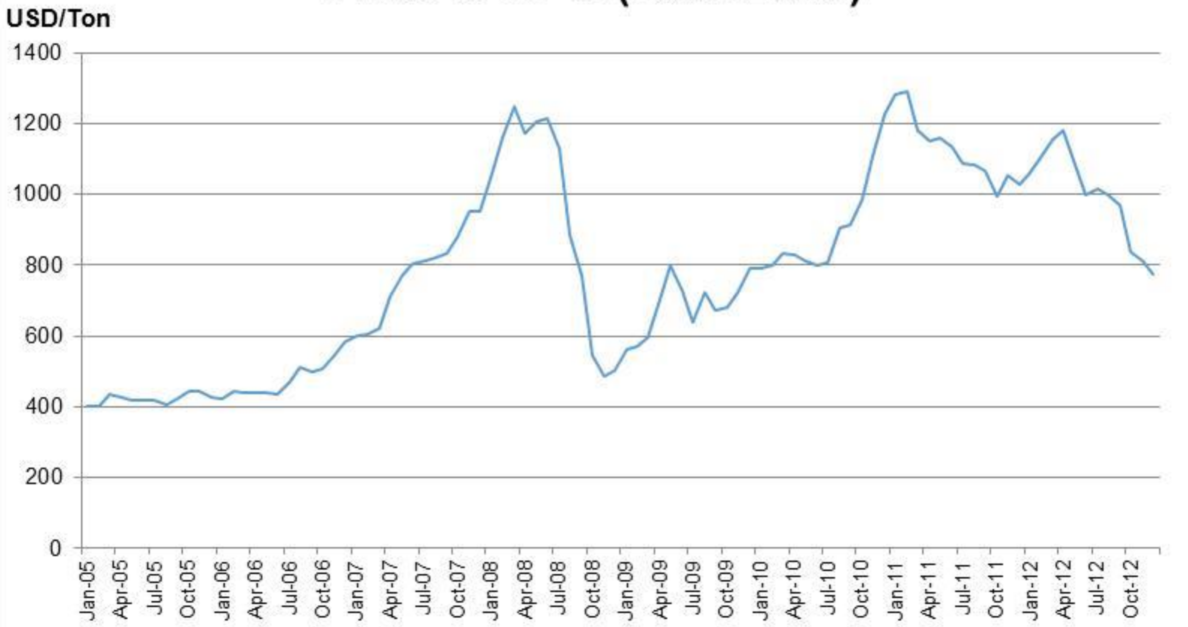
In this context, the biodiesel factory owned by R22 buys CPO from its palm oil company counterpart. In return, R22 sells biodiesel to the respective palm oil company and this company uses it as a substitute for fossil diesel within its daily operations. Thus, it would seem that there is a degree of industrial integration between the biodiesel company and the palm oil industry. However, when the international price of CPO significantly increased the palm oil company that previously supplied R22's biodiesel factory ceased his CPO supply and decided to sell CPO overseas. The outcome was stated by R22:

> *"We produced for a year and suddenly CPO prices increased steadily which meant the raw material price exceeded the price of HSD (fossil fuel diesel), so it did not make sense to continue business. Thus, we closed the factory."*

(R22, palm oil company representative, May, 2017)

Based on the excerpt above, it is evident that the palm oil industry had only limited interest in the biodiesel industry as they were not industrially integrated. Thus, the palm oil company (in the example above) preferred to sell its CPO on the overseas market rather than supplying R22's biodiesel company as the international price for CPO rose. Then the respondent's biodiesel company had to shut down its operation since it was unable to buy its feedstock. This suggests that the palm oil industry does not consider the biodiesel industry as an opportunity for profitable business expansion, but rather a mere customer for its product.

Figure 5.5
Price of CPO (2005-2012)



Source: Based on the data from Index Mundi, 2018

The palm oil industry did not consolidate its business with the biodiesel industry when the government implemented its biofuel policy in 2006. However, the analysis in Chapter 4 (Section 4.3) indicates that biodiesel production did increase rapidly from 2006 to 2010. Oliviera et al. (2017) assert that the biofuel industry expanded rapidly due to government policy interventions such as mandatory blending, subsidies and export tariffs. This trajectory is evident as more investment flowed into the biodiesel sector, particularly after 2008 when the government issued its policy on mandatory blending followed by subsidies in 2010. Furthermore, the palm oil industry expansion into biodiesel is not merely happened due to the implementation of these policies, but it is because of the government policy to stimulate the production of palm oil derivatives, namely Palm Oil Down-Streaming policy, which will be the primary discussion in Chapter 7. The government implement the palm oil down-streaming policy by imposing export tax on CPO and its derivatives. This policy creates an opportunity for palm oil industry, particularly large private companies, to connect with biodiesel industry as palm oil based biodiesel is consider as palm oil derivatives.

The abundance of CPO as a biodiesel feedstock led to an increase in its demand to produce biodiesel and subsequently increase the number of biodiesel factories in less than five years. There were only two factories in 2006 and the number rose to 22 factories in 2010, whilst production capacity increased from 215 million litres per year to 3.9 billion litres over the same timescale (GAIN Report, 2011, p.8). Moreover, palm oil companies did eventually enter the biodiesel business as respondent R22 highlighted:

> *"For (biodiesel) companies that don't have access to a refinery, they can't just produce biodiesel. Instead, they must buy CPO first so it is expensive. That is where palm oil companies like Wilmar, Musim Mas, Sinar Mas have an advantage since they can use the by-product of producing cooking oil as a biodiesel input material."*
>
> *(R22, palm oil company representative, May, 2017)*

The excerpt above suggests that biodiesel companies would have an advantage if they integrated with palm oil companies since they could access the by-product of cooking oil production which is much cheaper than CPO. It also suggests that the government's policies, both biofuels and palm oil down-streaming policies, have successfully inspired palm oil companies to expand into the biodiesel sector either through establishing new biodiesel companies or acquiring the existing ones. This is suggested by respondent R15 who stated:

> *"We are the CPO Producers' Association so our role is more as suppliers for the biofuel industry. But, the palm oil industry is relatively integrated so*

that upstream players are basically downstream players where members of GAPKI are also members of APROBI[10], especially the large ones."

(R15, Palm oil company representative, May, 2017)

The statement from R15, also a member of GAPKI (*Gabungan Pengusaha Kelapa Sawit* Indonesia/Indonesia's Palm Oil Companies Association), suggests that palm oil companies did ultimately develop bonds with biodiesel companies, creating so called agro-fuel alliances. Such bonding has proved significantly beneficial for the biodiesel industry as indicated during the field observation in the Pelintung Industrial Zone (IZ) in Dumai City which is owned solely by Wilmar, the biggest palm oil producer in Indonesia. In this IZ, there is a biodiesel company named Wilmar Bioenergy Ltd established by the Wilmar Group. Based on this example, there are three main factors that significantly contributed to the benefits of the biodiesel industry becoming vertically integrated with the palm oil industry.

First, the IZ formed an industrial complex that is independent in terms of providing fuel to power all plants within the facility. Palm dregs, a waste product from processed palm fruit, is used to produce electricity for all factories inside the IZ. Secondly, there is one harbour that serves all factories inside the IZ for export and import activity. This ensured all companies within the zone could become cost efficient, since they could immediately export their product as they had a harbour in their 'backyard'. Thirdly, since biodiesel can be produced either directly from CPO, from its derivatives, or from by-products of producing cooking oil (see **Figure 5.4**), a biodiesel company that is geographically close to a palm oil company would be able to access a variety of suitable feedstocks. This provides a biodiesel factory with the

[10] APROBI stand for *Asosiasi Producen Biofuel Indonesia* - Indonesia's Biofuel Producers Association.

option to select the cheapest feedstock material. Thus, the respective biodiesel company has benefitted from having ties with the parent palm oil company, Wilmar.

Although the discussion above is based on one palm oil company and one biodiesel company, the visit to other industrial zones (discussed in Chapter 3) has revealed that private palm oil companies tend to have similar features to the Pelintung IZ example. However, there is a stark condition happened as I observed an independent biodiesel company which was owned by R22 Respondent. The respondent stated that he closed his factory after the price of CPO increased significantly in 2008. During the observation, it is revealed that the respondent factory is independently build and not integrated within palm oil company industrial complex (**Picture 5.3**).

Picture 5.3
Abandoned Biodiesel Facilities

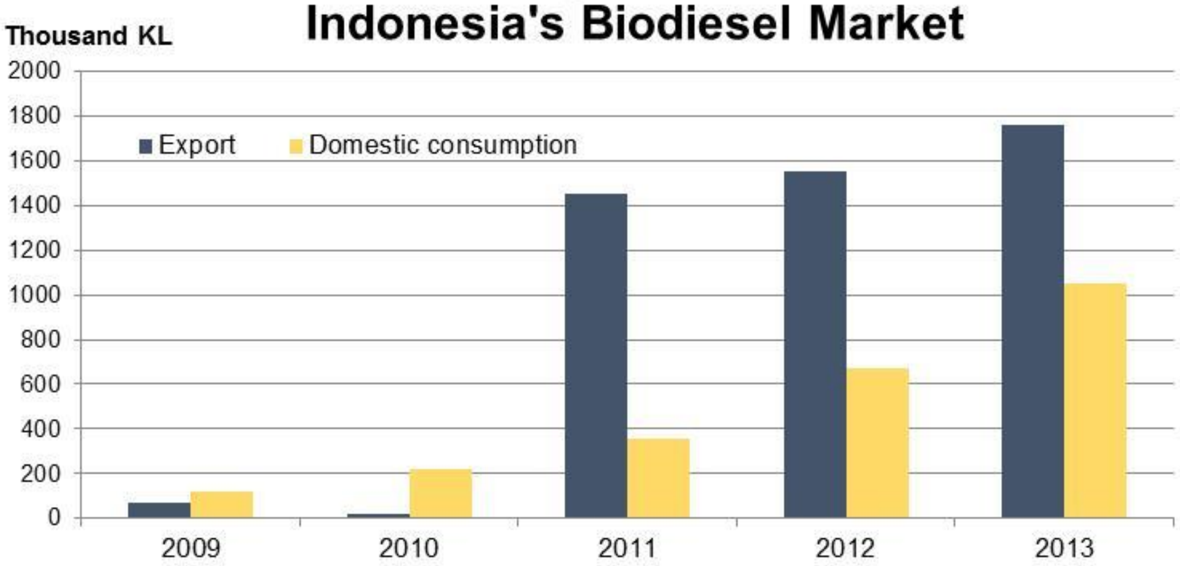
Source: Researcher owned documentation, 2017

The evidence from the field study suggests that palm oil companies' participation is beneficial for supporting the biodiesel industry and subsequently the government biofuel policy. This became apparent especially when the price of CPO skyrocketing in 2008 (see **Figure 5.5**) which disadvantageous for biodiesel industry that is not integrated with palm oil industry. Indeed, the production of domestic biodiesel has significantly increased over less than a decade from the policy initiatives being implemented, despite the increasing price of CPO (GAIN Report, 2010; Ministry of Energy and Mineral Resources, 2017, Index Mundi, 2018). This significant increase in biodiesel production highlights how an integration of biofuel factories with plantation companies has been important in developing efficiency and increasing biofuel production.

The analysis of Indonesia's biodiesel market suggests that the involvement of large and integrated agro-industry has been important in the processes of generating a burgeoning biodiesel industry. The analysis also shows that because biodiesel - unlike bioethanol - is a product that is specifically produced for fuel purposes, this eliminates any competition within its market regarding the product being used for other industrial purposes. This is the opposite of the bioethanol industry, where bioethanol is a commodity also needed by other industries for non-fuel purposes. Although the biodiesel industry also faced difficulties due to the increased of the price of CPO, the alliances between this industry and the palm oil industry has meant the industry could ultimately overcome these challenges.

The government initiatives to implement mandatory blending and subsidies has strengthened biodiesel industry. However, the implementations of palm oil down-streaming policy, which initially not part of biofuel policy (discussed in Chapter 7), have facilitated the eventual bonding between the biodiesel industry and the large-scale palm oil industry. This also related with Chapter 4 analysist as palm oil industry is a strong and cohesive agro-industry while sugarcane is the opposite. The absence of large agro companies within the bioethanol system has hampered the ability of bioethanol producers to mass produce their goods, yet, the opposite condition has emerged in the context of the biodiesel industry. Thus, it is suggested that the existence of large agro industries is not only necessary, but desirable for the development of the biofuel industry.

Figure 5.6
Indonesia's Biodiesel Market



Source: Based on the data from the Ministry of Energy and Mineral Resources, 2017

However, the increase in domestic biodiesel production does not match the increase in its domestic market, since the domestic biodiesel market is developing relatively slowly due to the preference of biodiesel producers to sell their product to the overseas rather than the domestic market **(Figure 5.6)**. This is partly because there is a growing demand of biodiesel in the overseas market combine with the government policy in imposing export tax for CPO that incentivise palm oil industry to bond with biodiesel industry (as in depth discussion will be presented in Chapter 7).

This is somewhat ironic as one of the reasons the Indonesian government implemented the biofuel policy was to reduce dependence on domestic fossil fuel (see also Chapter 1). Despite the domestic biodiesel industry flourishing after its bonding with palm oil companies **(Table 5.2)**, the industry faced a similar outcome to its bioethanol counterpart in that both were unable to meet the biofuel policy targets set by the government.

Table 5.2
Domestic Biodiesel Consumption (million litres)

Year	Diesel Consumption	Targeted Blending Rate	Biodiesel Needed	Domestic Biodiesel Production		Domestic Consumption
				Capacity	Actual	
2006	18,000	5%	900	215	65	5
2007	18,000	2.5%	450	1,709	270	22
2008	20,000	1%	200	3,138	630	23
2009	23,000	1%	230	3,528	330	60
2010	25,000	2.5%	625	3,936	740	220
2011	25,000	2.5%	625	3,936	1,575	358
2012	28,000	2.5%	700	4,280	2,200	670

Source: Created based on data from GAIN Report, 2011, 2013 and 2016

The fragmented bioethanol market explains why the bioethanol programme in Indonesia would fail without government policy intervention. However, the biodiesel sector should see its domestic market flourish given all the positive factors that support the industry such as abundance and cheap feedstock as well as the benefit in integrating with palm oil industry as discuss above. This indicates that there are other processes, events or phenomena that have shaped the domestic market for biodiesel. In the next section I argue for the strategic importance of biofuel customers within the biofuel market structure in shaping the poor domestic performance of biodiesel.

5.3. Regulating the Biofuel Market

Multiple studies using the lenses of political ecology and agrarian political economy have shown how a new market can be created when a government implements a biofuel policy (Wilkinson and Herrera, 2011; Hollander, 2011; Gillon, 2010). These studies have shown how internationally government targets for using biofuel in transportation at national levels have facilitated an increase in the production of biofuels and their feedstocks. However, previous research tends to focus on the government targets for biofuel blending and the way to achieve it (e.g. Hollander, 2011; Gillon, 2010; Pye, 2011), while there is not enough discussion about government involvement in regulating the biofuel market.

In the context of Indonesia, besides establishing the biofuel production target and mandatory blending initiative, the government also created a regulation regarding who had the right to blend biofuel with fossil fuel. This is stated in the Ministerial of Energy and Mineral Resources (MEMR) Regulation Number 51 (2006):

> *"Biofuel companies could sell their product to the final consumer."*
>
> *(Article 12 point 1)*
>
> *"Blending fossil fuel with biofuel can only be conducted by a company that has a license to sell fossil fuel."*
>
> *(Article 12 point 2)*

These excerpts from the government regulation indicate that biofuel companies can sell their product to anyone, but they cannot blend their product with fossil fuels since that is the prerogative of the fuel companies. This means that biofuel companies can only sell their product as a pure biofuel. However, neither bioethanol nor biodiesel can be used in their pure stages within an internal combustion engine (such as those within a car, bus or truck) without risking engine damage due to use of a non-recommended fuel (as based on the recommendations of the vehicle manufacturers). This is highlighted by respondent R22 who stated:

> *"Biodiesel cannot be used entirely in vehicle engines and recently the Japanese automotive association recommended 7.5% of biodiesel for their cars."*
>
> *(R22, Palm oil companies' representative, May 2017)*

> *"There was a problem of sludge appearing inside the engine when biodiesel was tested in a diesel engine with 20% blending (biodiesel proportion against fossil fuel)."*
>
> *(R9, Member of National Energy Board, May 2017)*

Both excerpts suggest that it is strongly recommended that biodiesel is blended with fossil diesel, since a large proportion of biodiesel inside an engine can cause damage. Moreover, respondent R22 stated:

> *"Technically, engines can use a blend of 20% or even more but only by wavering the manufacturer's warranty. For trucks owned by palm companies, they don't care about the risk of using biodiesel based on the manufacturer's recommendation. They only care about profit since the trucks are usually replaced after a couple of years."*
>
> *(R22, Palm oil companies' representative, May 2017)*

Based on the statement by R22, using a large biodiesel percentage - even as high as 100% of fuel concentration - would not be a major problem in trucks owned by palm oil companies. Such vehicles are used for daily plantation operations including carrying fresh palm bunches to palm mills where a portion of the mill's output, CPO, is bought by a biodiesel company. Palm oil companies can operate more efficiently by using a portion of their own output processed by a biodiesel company providing that there is a large price discrepancy between fossil fuel and biodiesel. However, this also suggests that the implementation of the Ministry of Energy and Mineral Resources (MEMR) Regulation Number 51 (2006) has limited the biodiesel market to only fossil fuel distributors and certain palm oil companies where the latter use biodiesel to reduce their operational costs.

In the context of bioethanol, Wilkinson and Herrera's research (2011) shows that the sales of flex fuel cars[11] in Brazil increased exponentially when the oil price skyrocketed in the early 2000s. Certain car engines were able to use bioethanol without the need to blend it with fossil fuel. Their research also indicates that bioethanol has become an alternative fuel to gasoline and diesel since the Brazilian government introduced it in the 1970s. This is totally different to Indonesia since the country only adopted its biofuel policy in 2006 and vehicle owners are still unfamiliar with biofuels, both bioethanol and biodiesel. Moreover, vehicle engines in Indonesia are only designed to run on gasoline or diesel. Thus, substituting gasoline with pure bioethanol (FE) would pose a risk in terms of damaging a vehicle's engine. Thus, the only effective way to market bioethanol is by blending it with fossil fuel (gasoline).

That said, MEMR Regulation Number 51 (2006) has effectively limited the customers of biofuel producers to fossil fuel companies. There are only four fossil fuel companies operating in Indonesia - Shell, Petronas, Total and Pertamina - and all but the latter are private companies. However, private fuel companies would have difficulties if they wanted to sell blended fuel, since they already have a limited market as their fuel stations are mostly located in big cities with dense populations.

[11] Car that can use either pure bioethanol or pure fossil fuel.

Their limited market has arisen as a consequence of the government's fossil fuel subsidy which started in the 1970s when it appointed Pertamina – the State-Owned Enterprise (SOE) - as the sole subsidized fossil fuel distributor domestically (Ministry of Finance, 2004). Thus, the domestic fuel market is essentially dominated by this SOE and the company has fuel distribution networks in every part of Indonesia. Nonetheless, for private fuel companies, selling blended fuel would be a high-risk endeavour due to profit uncertainty and the significant investment needed to build a blending facility. As such, private fuel companies are not particularly interested in getting involved in the government's biofuel policy.

Conversely, the government could 'encourage' Pertamina to participate in its biofuel policy as highlighted in Presidential Instruction Number 1 (2006):

> *"To encourage state-owned enterprises in the energy business to use biofuel as an alternative fuel."*
>
> *(Instruction 10, Point d)*

Although the excerpt from the government regulation above does not specifically mention Pertamina, it is the only SOE for which selling fossil fuel provides a key income. Moreover, the word 'encourage' can be defined as gentle coercion since the government, as the owner of Pertamina, would have the right to make the company comply with government policy. Thus, the enactment of Presidential Instruction Number 1 (2006) along with MEMR Regulation Number 51 (2006) have essentially appointed Pertamina as the sole blender for biofuel producers.

Pertamina's position as the only state oil company, with a large domestic fuel market, has made it the biggest and the most strategic SOE in Indonesia's economy. The SOE's huge domestic market could potentially create significant demand for biofuel to be mixed with fossil fuel. This would potentially allow the biofuel industry to benefit from selling its product to this SOE since biofuel companies are not allowed to mix biofuel with fossil fuel. Moreover, Pertamina is also the only fuel distribution company that is assigned by the government to distribute subsidized fossil fuel. This means the SOE has the advantage of having the largest proportion of domestic fuel customers (compared to private fossil fuel distributors) with the company selling both subsidized and non-subsidized fuel. Thus, from the economic perspective, it is more efficient for biofuel companies to sell to Pertamina since they do not need to find other customers for their product. Biofuel policy implementation is expected to increase Pertamina's demand for biofuels - both bioethanol and biodiesel. Thus, the government's policy to regulate the domestic biofuel market in theory should have led to a mutual symbiosis between Pertamina and the biofuel industry.

However, having Pertamina as the only company with the authority to blend fossil fuels is proving to be disadvantageous for the domestic biofuel market as its demand is solely determined by a single company. Moreover, Pertamina's demand for biofuel is determined by the price of fossil fuel - the disparity between biofuel and fossil fuel prices is the SOE's primary factor in determining how much biofuel it needs to maximize profits. The SOE also benefits as a distributor of subsidized fossil fuel with the subsidy already included in the profit margin (see **Figure 5.7**). This could make Pertamina hesitant to blend biofuel with subsidized fossil fuel as explained below.

Figure 5.7
Fossil Fuel Subsidized Schemes

Subsidy = (MOPS + Alpha) – Fuel Retail Price

Source: Based on Presidential Regulation Number 55 (2005)

Figure 5.7 indicates that fossil fuel subsidies are determined by two variables. The first variable is MOPS (mean oil plats Singapore) which is the price for fossil fuel that Pertamina pays to its supplier. This already includes all costs incurred such as freight insurance, transportation costs and overheads. The second variable is Alpha which is the domestic fuel distribution cost and profit margin for Pertamina. The former is the variable that cannot be controlled by the government and is highly volatile, while the latter is a figure decided by the government. The Alpha variable was legalized through the enactment of a presidential regulation - Presidential Regulation Number 55 (2005). The two variables constitute the economic price of fuel per litre where the amount of subsidy depends on how much the government wants to set as the retail fuel price per litre. Thus, the fossil fuel subsidy scheme in the presidential regulation document allowed Pertamina to profit from every drop of subsidized fuel distributed in Indonesia despite the volatility of the MOPS variable.

Such a situation makes Pertamina hesitant to blend biofuel with subsidized fossil fuel as stated by respondent R1:

> *"Pertamina is basically reluctant to buy biofuel from us and mix it with (subsidized) fossil fuel, because it is more profitable if they import fossil fuel from overseas. The company couldn't get a profit margin from selling biofuel whereas selling fossil fuel would earn profit from the alpha."*
>
> *(R1, biofuel producer representative, April 2017)*

The excerpt above explains that Pertamina would lose its profit margin by selling a blended biofuel. For example, if the company sells subsidized fossil fuel, it will obtain a 100% profit margin from Alpha. However, if the company blends subsidized fossil fuel with 5% biofuel, the company only gets a 95% profit margin from Alpha. Moreover, since the MOPS variable also includes the transportation cost for fossil fuel into Pertamina's fuel depot, the SOE would have to pay for fuel transportation costs if it buys biofuel (as this was not subsidized in the first few years of biofuel policy implementation). Thus, mixing biofuel with subsidized fuel will not be profitable for Pertamina as the SOE will lose profit from the loss of Alpha and have increased operational costs from transporting biofuel to its depot.

The only profitable biofuel endeavour for Pertamina is through blending biofuel with non-subsidized fuel. However, this would significantly limit Pertamina's demand for biofuel since there is a price gap between subsidized and non-subsidized fuel that encourages customers to buy the cheaper subsidized fossil fuel. Since Pertamina's decision to buy biofuel depends on the price gap between biofuel and non-subsidized fossil fuel, it becomes difficult to sell biofuel in the domestic market. In the context of bioethanol, the fragmented market for this product has caused a price mismatch between Pertamina and the bioethanol producers, where the former wants the price to be as cheap as possible and the latter already has a standard set price. In the context of biodiesel, the increase in the CPO price (see **Figure 5.4**) has caused the price of biodiesel to increase and the SOE is reluctant to buy expensive biodiesel. This is highlighted by respondent R22:

> *"We experienced domestic price problems since our feedstock price is skyrocketing and this makes biodiesel very expensive. However, for the European market the price will not be a problem - because in Europe and the USA 1 litre of HSD (high speed diesel) is almost 1 Euro which is Rp. 13,000 (at that time) thus, it is still competitive there."*
>
> *(R22, Palm oil companies' representative, May 2017)*

The above statement reveals that the increased price of CPO internationally has made biodiesel too expensive for Pertamina to purchase since it would not be competitive even against the domestic non-subsidized fuel price. However, the respective price of biodiesel is still competitive in the overseas market, particularly Europe, which explains the decision of the biodiesel companies to export their product (see **Figure 5.6**). Although the government eventually decided to implement subsequent policies to improve the performance of the domestic biofuel market - i.e. mandatory blending and providing a biofuel subsidy - both policies are still failing to remedy the market situation. This will be explained in more detail in Chapter 6.

The government decision to regulate the domestic biofuel market has limited the ability of the biofuel industry to sell its product in the domestic market. This is because biofuel cannot be used directly inside the engine of a vehicle without posing a risk of damage and thus blending it with fossil fuel is necessary. Moreover, the government policy of authorising Pertamina as the sole blender of biofuel with fossil fuel has created additional problems. The domestic biofuel market has become heavily reliant on a single company, whilst the demand for biofuel is determined by the price gap between biofuels and fossil fuels. These factors have severely undermined the domestic biofuel market, while seeing the biodiesel industry expand based on international exports.

5.4. Summary and Conclusion

The discussion about Indonesia's biofuel market structure along with its policy regulations has increased our understanding of its importance in supporting the development of biofuel industries and the emergence of agro-fuel alliances. Current literature from political ecology and agrarian political economics has suggested that a biofuel industry will thrive when a government implements a biofuel policy and a new market is created increasing demand for the respective product (Wilkinson and Herrera, 2011; Hollander, 2011; Pye, 2011; Oliviera, 2017). However, the Indonesian biofuel case study has shown that the market structure and industrial structure of specific forms of biofuel play an important role in promoting or hindering the development of the industry. The evidence from Indonesia has shown that it is important to look beyond government policy and understanding the significance of an effective and integrated agro-industry to understand the rapid growth of the biofuel industry.

The agrarian policy discussed in Chapter Four has created different consequences for the feedstock industries for bioethanol and biodiesel; the former has created an ineffective agro-industry, while the latter has experienced the opposite result. The analysis has shown how the differences in feedstock production eventually influenced the industrial performance of both types of biofuels. For the bioethanol industry, the ineffective sugar commodity agro-industry has led to a fragmented bioethanol feedstock market. This has created difficulties for the bioethanol industry, which has struggled to secure its feedstock and hampered the industry’s ability to mass produce bioethanol. This is in contrast to biodiesel, as the strong and integrated palm oil agro-industry has provided an advantage to biodiesel producers who can obtain feedstock in abundance.

Taking this further, the analysis in this chapter has shown how the different structure of the bioethanol and biodiesel industries has also influenced their respective markets. Being positioned as a multipurpose commodity has ensured that bioethanol is a product in demand by various industries – not just the fuel industry but also the food, pharmaceutical and cigarette industries. Thus, the bioethanol industry prefers to supply consumers who do not require compromise on the price of the product, and as a consequence biofuel producers are unable to ensure mass production due to constraints in securing feedstock. In contrast, biodiesel is a derivative product of palm oil which can flexibly be produced either straight from palm oil or through its derivatives. This gives an advantage to the biodiesel companies which can mass produce their product and thus widens the market for potential buyers.

The government's decision to regulate the biofuel market and authorise Pertamina as the sole biofuel-fossil fuel blender has created issues for the domestic biofuel market, as the SOE is only willing to buy biofuel if its price is significantly lower than its fossil fuel counterpart. This disincentivises the bioethanol industry to produce FE to meet domestic demand, as the industry cannot lower its price to meet Pertamina's expectations. Similarly, the biodiesel industry is hesitant to supply the domestic market when the overseas market offers a better price than Pertamina. Thus, the government's decision to name Pertamina as the sole biofuel-fossil fuel blender has resulted in a lack of growth in the domestic biofuel market.

The analysis in this chapter has suggested that understanding both the market structure and industrial structure for different types of biofuel is important before formulating and implementing biofuel policies. Indonesia's biofuel case study has shown that although policies were implemented to control the domestic market, such as mandatory blending and subsidies, there was a disregard for the market and industrial structures related to the different types of biofuel, culminating in unexpected consequences from a policy perspective.

For bioethanol, the policies worsened the situation and caused the discontinuation of the production of fuel grade bioethanol for fuel purposes. For biodiesel, the respective policies effectively created a bond between the biodiesel and palm oil industries. This gives important insights into part of the story but there is more to be learnt from looking at the underlying politics of Indonesia's biofuel policy to understand why it has not achieved its purpose. Such discussion will bring into view consideration of the power relations between the biofuel industry, plantation companies, Pertamina and the government. This will be discussed in depth in Chapters 6 and 7.

Chapter Six

The Politics of Biofuels:

A Contested Political Commitment to the Development of Biofuels

This chapter aims to answer the question: How are politics and political processes enacted by actors involved in the biofuel energy nexus in ways that have shaped biofuel policy and practice? I analyse the way that problems of political will in pursuing approaches to biofuel policy and power relations between different actors and government departments have led to challenges in formulating biofuel policy and ultimately contributed to the reshaping of policy in favour of certain industries, in this case the large, private palm oil industry.

In answering the question above, the analysis is divided in two chapters where Chapter 6 focusses on the politics surrounding the failure of the bioethanol program and Chapter 7 discusses the politics of palm oil as the 'winner' in terms of the outcomes of Indonesia's biofuel policies and politics. The lenses of political ecology and agrarian political economy are in this chapter used to understand the *power relations* between different stakeholders involved in the Indonesian biofuel energy system. I will focus the analysis on governmental politics and policies and argue that these have been a major factor in the constitution of both the failures and successes of developing the biofuel industry.

In this chapter, in addition to my wider data corpus of interviews and documentary analysis, I will analyse the data derived from utilizing and reflecting on my personal experience as a government employee directly involved in making laws and regulations in Indonesia particularly the Law on the State Budget. This experience, despite not being directly related to biofuel policy making, is related to aspects such as palm oil industry and energy subsidy policies, as every policy involving government funds in Indonesia requires inclusion in the government budget policy. Thus, my experience offers useful supplementary data, as I am able to reflect on the way regulations are made more generally, particularly the structure and length of the processes involved.

This chapter is composed of three analysis sections. The first section analyses the use of fiscal incentives in biofuel policy and the problems related to this that have meant the outcomes of the policy are the opposite to those intended. The second section discusses how overlapping policies have become a problem for the bioethanol industry, in particular, and shows how attempts by the government to resolve the emergent problems ultimately escalated the problem contributing to an eventual shutdown of this part of the biofuel industry. The third section discusses the underlying political economy of biofuel implementation and examines the government's political commitment to developing biofuel, situating it as a contested policy. The chapter concludes by arguing that political commitment from the top political elite is vital for the growth of the biofuel industry as it gives clear direction for government officials in formulating the necessary policies.

6.1. Ineffective Biofuel Policy: Creating Incentives that Disincentivise the Biofuel Industry

In Chapters 4 and 5 I focused on how differing feedstocks and commodity market dynamics shaped the biofuel industry with various outcomes for different forms of biofuel. For the bioethanol industry, the fragmented market within the bioethanol system created difficulties in the production of bioethanol (FE) at large scale and thus made bioethanol companies retract and shrink. Conversely, the biodiesel industry was able to grow rapidly due to its cheap and abundant Crude Palm Oil (CPO) feedstock, yet its domestic market growth still slowed as most of the biodiesel produced was sold to the more lucrative overseas market. In this chapter, I will examine in detail the role that politics and policy played in shaping these processes with the focus on the bioethanol industry.

As has been previously discussed in Chapter 5, government policy in regulating the biofuel market through implementation of the Minister of Energy and Mineral Resources (MEMR) Regulation Number 51 (2006) made Pertamina, the state oil company, the only buyer of biofuels domestically. Thus, to increase the use of biofuel - both bioethanol and biodiesel - in the domestic fuel market, the government issued the MEMR Regulation Number 32 (2008) which marked the starting point for the mandatory blending policy. Before this policy was implemented, Pertamina only blended biofuels with non-subsidized fossil fuel which greatly limited the market for biofuels. However, the mandatory blending policy allowed Pertamina to blend biofuel with subsidized fossil fuel. The regulation stated:

> *"Fuel companies and direct fuel users that implement the mandatory blending policy, as well as biofuel companies that supply biofuel for fuel companies, can be given both fiscal and non-fiscal incentives."*
>
> *(*Ministerial *of Energy and Mineral Resources Regulation Number 32, 2008, Article 6)*

The excerpt above stated clearly that all three stakeholders involved in the domestic fuel market - fossil fuel companies, biofuel companies and fuel consumers - can receive incentives from the government. In 2008 the only economic incentives given by the government in the domestic market were fossil fuel subsidies. This subsidy policy benefitted both fuel users and Pertamina - the former benefitted from cheap fossil fuel prices, while the latter benefitted through increased monetary revenue as the government paid fuel subsidies to the State-Owned Enterprise (SOE).

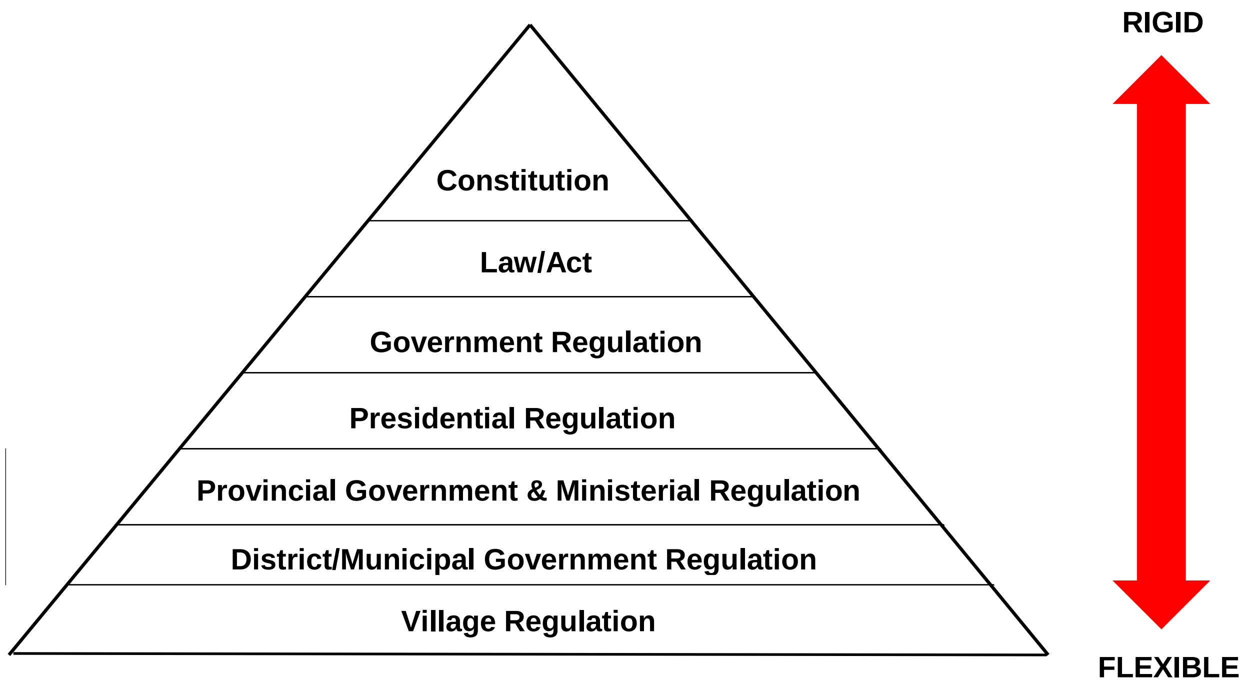
The implementation of MEMR Regulation Number 32 (2008) can thus be interpreted as widening the scope of the current government subsidies to include biofuel, with associated positive outcomes for the industry. However, this created problems for Pertamina because the government subsidy on fossil fuels had become part of the company's income source and the fossil fuel price was used as a benchmark to determine the subsidy amount. Thus, the SOE would lose a portion of its income if it chose to buy biofuel; this made it reluctant to purchase supplies from the biofuel industry (as discussed in Chapter 5). Added to this, the mandatory blending policy was essentially insufficient to make Pertamina comply. As respondent R22 stated:

> *"Pertamina is responsible to the Ministry of State-Owned Enterprise. Meanwhile, the ministry issuing the regulation (mandatory blending target) is the Ministry of Energy and Mineral Resources. Selling biofuel to Pertamina needs to be subsidized since biofuel is more expensive than fossil fuel. However, if the biofuel price is more expensive than that of fossil fuel, Pertamina will not buy it and the company usually ignores it (the mandatory blending target)."*
>
> *(R22, Palm oil companies' representative, May 2017)*

Based on the statement above, the respondent claimed that being positioned under the Ministry of State-Owned Enterprise gave Pertamina the power not to comply with the mandatory blending regulations of the Ministry of Energy and Mineral Resources, particularly if buying fossil fuel was cheaper than biofuel. However, this does not necessarily mean that as a state-owned enterprise, Pertamina is *only* bound by the Ministry of State-Owned Enterprise, or that the Ministry of Energy and Mineral Resources does not have authority to enforce the biofuel policy on Pertamina.

SOE involvement with the biofuel policy is partly due to the enactment of Presidential Regulation Number 5 (2006) and Presidential Instruction Number 1 (2006) - both have a stronger authority level than ministerial regulations (see **Figure 6.1**). However, it is MEMR Regulation Number 51 (2006) that involves Pertamina directly with the biofuel industry, as this regulation gives the authority to the SOE as a fuel blender for blended fuel to be sold in the domestic market (as discussed in Chapter 5). This ministerial regulation is also a derivative of the respective presidential document, meaning that the Ministry of Energy and Mineral Resources could create a policy and force Pertamina to comply with it providing that the policy is supported by a higher-level regulation.

Figure 6.1
The Regulation Hierarchy in Indonesia



Source: Based on Law Number 10/2004 on the Formulation of Regulations

Although MEMR 32 (2008) is also a derivative of the respective presidential regulation, careful scrutiny of this ministerial policy document has revealed that there is no mention within the document of anything that specifically requires the use of the fossil fuel subsidy to subsidize biofuel. This creates a loop-hole for Pertamina and means that the SOE does not have to use the government subsidy to buy biofuel, as the subsidy was originally intended for fossil fuel. There is, thus, no regulation at the Ministry level or higher to force Pertamina to use the fossil fuel subsidy to subsidize biofuel. Hence, Pertamina could still enjoy the government subsidy without having to use it to purchase biofuel.

Conversely, the biofuel industry, particularly bioethanol companies, would still have to compete within the dynamic market regime if they chose to implement the government's mandatory blending policy. Meanwhile, for the biodiesel industry complying with the mandatory blending policy would be less profitable than selling its product overseas since the domestic market was controlled by Pertamina (as discussed in Chapter 5).

Table 6.1
Fiscal Incentives Provided by the Government

Regulation Name	Administering on
Ministerial of Finance Regulation Number 156 (2009)	VAT rebate for biofuel transaction in domestic market in 2009
Ministerial of Finance Regulation Number 21 (2010)	Tax and customs incentives for utilization of renewable energy source
Ministerial of Finance Regulation Number 130 (2011)	Corporate tax reduction or exemption incentive
Government Regulation Number 52 (2011)	Income tax incentive for investment in certain sectors and/or regional areas

Sources: Author documentation

Besides the current subsidy policy, there are also other policy incentives given to biofuel industries as stipulated in MEMR Regulation Number 32 (2008) (**Table 6.1**). These incentive policies are formulated by the Ministry of Finance given the connection to tax, which is under this Ministry's jurisdiction. Among multiple incentives, only the Minister of Finance (MoF) Regulation Number 156 (2009) is solely dedicated to biofuel development, with the other regulations concerning the incentives for general investment in Indonesia. However, this fiscal incentive created major problems for the biofuel industry as it inadvertently had an adverse impact on the industry's cash flow due to the arduous nature of government bureaucracy in Indonesia. As respondent R1 stated:

> *"The government gave us many fiscal incentives, but most of them are useless. For instance, we can't use an incentive like value added tax (VAT) rebate because it takes 7 months for the restitution process. Although we received our tax rebate, we lost some portion of our money due to interest expenditure, since we used bank loans as our capital. And that is a huge cost for us."*
>
> *"You're only eligible to apply for it (a VAT rebate) if your company has been audited by a public accountant for 3 consecutive years, and there is not even one company that has been established for 3 years. Some (biofuel) companies are just newly established for 3 months or 6 months, so these incentives are worthless. Thus, we refuse them (incentives) since it is useless to provide fiscal incentives that we cannot use."*
>
> *(R1, Biofuel companies' representatives, May 2017)*

According to R1's first statement, the government had provided fiscal incentives for biofuel companies, but these incentives could not be enjoyed by their intended recipients, because biofuel companies had to face arduous bureaucracies that forced them to wait for several months in order to being refunded. Such a situation happened because the respective regulation needed another regulation to enable its timely execution as the regulation stated:

> *"The procedures for the administration of taxation are needed to implement this Ministerial of Finance Regulation which will be regulated by The Director General of Taxes Regulation."*
>
> *(*Ministerial *of Finance Regulation Number 156, 2009, Article 5)*

Based on the above excerpt, a derivative regulation is required to execute the respective MoF Regulation and this process can take months. This confirms the first statement from respondent R1 above that disbursement of VAT rebates takes a very long time and can negatively impact the finances of a biofuel company. Fiscal incentives for the biofuel industry are supposed to help strengthen its capital turn-over which would subsequently increase biofuel production. However, in reality, the incentives have caused the industry to lose money by disrupting its cash flow. Moreover, in his second statement R1 also indicates that these incentives would be useless anyway as many biofuel companies are unable to access them given the auditing requirements to make companies eligible. Thus, there is some policy inconsistency evident - there is a mismatch between the purposes of the policy and the way to access it that does not meet the expectations or requirements of the nascent biofuel industry.

Meanwhile, the other fiscal incentive policies are essentially formulated for general investment in Indonesia, where the biofuel industry could be included providing the investment met the terms and conditions stipulated by each policy. These fiscal incentives are mainly targeted at attracting new investment into Indonesia meaning existing biofuel companies (bioethanol and biodiesel) are again mostly unable to meet the requirements, because they had started their operations before the mandatory blending policy was implemented (see Chapter 5). Thus, the fiscal incentives provided by the government for the biofuel industry ultimately became meaningless, only serving as a supportive policy on paper.

The Ministry of Energy and Mineral Resources stipulated that the biofuel industry would receive fiscal incentives. Nonetheless, any fiscal incentives given to an industry must meet a standard approved by the Ministry of Finance. This means there are two government bodies with differing authority, but with roles in administering the same policy. On the one hand, officials from the Ministry of Energy and Mineral Resources are likely to understand the current state of the biofuel industry (bioethanol and biodiesel). Yet, they may not understand the requirements that private institutions have to meet in order to receive fiscal incentives. On the other hand, officials from the Ministry of Finance focus on assessing the level of investment that makes a company eligible for fiscal incentives e.g. the amount of investment, the number of jobs created, the location and the source of input material. Biofuel is just one type of investment that needs to fit the standards of the Ministry of Finance to receive fiscal incentives, disregarding factors that are specific to the biofuel industry such as its market, industrial structure and previous agricultural policies (discussed in previous chapters). As such, problems emerged since officials in both units were only focused on their respective tasks and processes without seeing the bigger picture for Indonesia's biofuel industry.

Thus, it is suggested that both government bodies have their respective authorities in designing a policy and neither body wants its authority to be compromised by other government bodies. The Ministry of Energy and Mineral Resources has the authority to set the target for the biofuel policy, but it cannot design the types of incentive that fit the biofuel industry. The Ministry of Finance, on the other hand, is in charge of designing the fiscal incentive policy, but in doing so, it cannot produce too many policies that appear to favour a particular industry, since its primary concern is general investment and biofuel is just one among many industries. This suggests the reason for only one policy solely dedicated to the biofuel industry being issued by the respective Ministry (see **Table 6.1**).

Current literature using the lenses of political ecology and agrarian political economy has shown that requiring mandatory biofuel use within domestic fuel markets has been an effective policy instrument promoting the success of the biofuel industry in countries such as the US and Brazil (Gillon, 2010; Wilkinson and Herrera, 2011; Oliviera et al., 2017). Although these previous studies did not discuss government policy documents meticulously, they do highlight policy success in encouraging biofuel companies to increase production in an attempt to achieve government targets. They argue that this has been, in part, due to the ways that such government policies were able to give certainty to the biofuel industry, offering security for investment. In the context of Indonesia's biofuel policy, however, any potential success of the mandatory blending policy remains unrealised as the biofuel industry is unable to benefit from such a policy owing largely to ineligibility and bureaucratic processes that make it economically unviable. These problems with the existing processes associated with the mandatory blending policy and other fiscal incentives are well recognised by the industry and a source of frustration. As respondent R22 stated:

> *"We're doing this business for profit not for charity. The government should give a proper incentive that makes our return faster, economical and so on."*

(R22, Palm oil companies' representative, May 2017)

Based on R22's statement, it is suggested that government incentives must be financially beneficial for biofuel companies, since that is the main reason for them to enter the biofuel business.

The apparent inability by the different government ministries to formulate incentives that can truly benefit the biofuel industry has, in reality, disincentivised the industry as regards strengthening the domestic biofuel market. This is partly because the policies are, in practice, not being utilised; the fiscal incentives are not specifically crafted for the biofuel sector given their distinctive characteristics and the mandatory blending policy is ambivalent towards the biofuel industry, allowing for continued use of fossil fuels. This situation makes the government's political commitment in pursuing biofuel policy questionable - the policy has been created and executed, yet the government's actions in terms of implementation and ensuring outcomes are inconsistent. This inconsistency within government policy and actions relating to the biofuel policy has had serious implications for the bioethanol industry as one part of the biofuel industry (and in contrast with the biodiesel industry which will be discussed in Chapter 7). This forms the focus of the next section.

6.2. The Case of Bioethanol: Policy and Politics in the Eventual Shutdown of the Bioethanol Industry

Chapter 5 discussed market competition between different consumers of bioethanol that caused a mismatch in the price expectation between Pertamina, as the sole consumer of bioethanol and bioethanol (FE) producers. Pertamina expected the price of bioethanol to be competitive with its fossil fuel counterpart, while the bioethanol companies could only offer prices based on their production costs. This section turns the focus away from markets and onto the roles of policy and politics, looking at the ways these shaped and contributed to the demise of bioethanol. Moreover, the section also explores some of the concepts from the literature about policy governance in order to help explain overlapping policy and policy conflict.

Fowler and Johnson (2017) argue that energy policy is not the responsibility of a single government body and thus, addressing it improperly could create consequences for the government itself. This would be the case the biofuel policy in Indonesia, particularly the bioethanol programme, as there are two government ministries in Indonesia managing different policies on bioethanol. One key issue that emerged for the domestic sale of bioethanol was the existence of ‘overlapping’ policies between biofuel and excise tax. In what follows, the analysis explains how a conflict between these two areas of policy would have severe consequences for Indonesia’s bioethanol programme. Moreover, it also shows how the government did not intervene by effectively resolving this policy conflict issue. Instead, the government introduced another policy - a subsidy for the bioethanol industry - with the expectation to resolve any problems entangling the industry. However, instead of being a problem solver, this policy worsened the issues to the point where the bioethanol industry stopped producing fuel grade bioethanol.

The first policy of importance in this part of the analysis is a 1995 policy that prohibited the sale of alcohol in Indonesia and introduced high tax tariffs on any associated products, such as ethanol. This was stipulated in Law Number 11 on Excise (1995)[12]:

> *"Excise is imposed on Excise Goods consisting of:*
> *a. ethyl alcohol or ethanol, ignoring the ingredients used and the manufacturing process;*
> *b. alcoholic beverages of any percentage, ignoring the ingredients used and the manufacturing process, including concentrates containing ethyl alcohol;*
> *c. tobacco products, which include cigarettes, cigars, leaf cigarettes, sliced tobacco, and the results of other tobacco processing."*
>
> *(Law Number 11/1995, Article 4)*

From the excerpt above, the Law on Excise (1995) made a very clear statement that ethanol regardless of material origin, production method, purpose or purity is subject to excise tax. Moreover, this tax is for the consumer, where the buyers of bioethanol will have to pay. This law has the following purposes:

> *"The tariff imposed is not oriented on (government) revenue aspects, but on aspects of production and consumption restrictions for certain goods in which their nature or characteristics have a negative impact on health, environment, and social order such as liquor where the way to limit it is through tariff instruments."*
>
> *(Law Number 11/1995, Explanatory chapter Article 5 point 1)*

From the excerpt above, it is explained that the tax imposed on bioethanol is because it is used to make liquor and the government wanted to tax liquor given its negative impact on health and social order. Indeed, there are numerous media

[12] Although the Law on Excise was amended in 2007, the aspects discussed in this section did not change in the amended law with the exception of the tax rate.

reports about abuse of ethanol, where it is used as a mixture in a compound to make intoxicating drinks and causes fatality to many who consume it. Although the number of casualties for etanol abuse before 1995 is uncertain due to difficulties in finding such data, a recent media report stated that more than 600 deaths occurred between 2008 and 2016 due to the consumption of liquor made with an illegal mixture of ethanol (Tribunnews.com, 9 April 2018). Moreover, the Global Agriculture Information Network (GAIN) Report (2006) also mentions that the food and beverages industries, that also include the alcoholic beverages industry, use bioethanol with a purity of 99.95%, which is equal to fuel grade bioethanol or fuel ethanol (FE). Thus, bioethanol inadvertently became a focus for the government as it can be used legally by the liquor industry or illegally by irresponsible individuals. This became a justification for the government to regulate and impose excise tax on bioethanol.

The excise tax imposed on bioethanol would serve as a means to increase the price of bioethanol, far exceeding the cost of its production, as the law stated:

> "*The tax rate for bioethanol is 250% of the factory sale price or 55% of the retail price."*
>
> *(Law Number 11/1995, Article 5)*[13]

Based on the above excerpt, the consumer would have to pay 3.5 times more for bioethanol if it is bought from the bioethanol factory. Conversely, consumers would only pay 1.5 times more if the respective bioethanol is sold by the industry that buys

[13] The excise law was amended in 2007 and increased the tax rate for bioethanol to 1,150% of factory sale price and 80% of retail price. As the law was amended after the government implemented its biofuel policy in 2006, it also meant that bioethanol would carry the new tariff which further increased its price on the market.

the product from the bioethanol factory, providing that the respective product also has excise tax imposed such as with cigarettes and liquor. This would mean buying bioethanol from the factory would be more expensive than just buying a product that contains bioethanol. In the context of fuel grade bioethanol, Pertamina as a bioethanol buyer, is categorized as a consumer buying bioethanol straight from the factory. This means the SOE, as well as other industries that are categorized as direct consumers of bioethanol, could be charged the highest tax rate.

However, article 9 of this law stipulated the exceptions for bioethanol that could be free from the excise tax:

> *"Excise exemption can be given for Excise Goods:*
>
> *a. used as raw or supplementary materials in making non-excisable goods;*
>
> *b. for the purposes of scientific research and development;*
>
> *c. for the purposes of representatives of foreign countries and their officials serving in Indonesia based on the reciprocity principle;*
>
> *d. for the needs of foreign workers in international bodies or organizations in Indonesia;*
>
> *e. carried by passengers, crews of transport facilities, border crossers or foreign packages (with certain quantity and price limitations);*
>
> *f. used for social purposes;*
>
> *g. put in a Bonded Stockpiling Zone."*
>
> *(Law Number 11/1995, Article 9)*

Moreover, a point (a) of explanation of this law stated:

> *"Excise clearance facilities based on the provisions in this letter (point a) are intended to support growth or industrial development that uses excise goods as raw materials or auxiliary materials in the manufacture of finished goods which are not excisable goods, both for export and for purposes of domestic marketing, such as ethyl alcohol used as a raw material or auxiliary material in making ethyl acetate, acetic acid, drugs and so on."*
>
> *(Law Number 11/1995, Explanation of Article 9)*

From these excerpts, it is evident that other industries such as those making ethyl acetate, acetic acid and pharmaceuticals are exempt from excise tax; this is clearly stated in the law. This means these industries can buy bioethanol (FE) without the excise tax. However, Pertamina cannot obtain an exemption as it is not specifically stated by the law, as the excise law was made a decade before the implementation of the biofuel policy. Such a condition suggests that policy makers at that time were unaware that bioethanol could also be used for fuel purposes. This has created a disadvantage for the bioethanol industry wanting to sell bioethanol for fuel purposes, because Pertamina is reluctant to buy expensive bioethanol, when the blended fuel would prove an expensive fuel product for regular fuel customers as compared to fossil fuel (pure gasoline) products which are much cheaper.

When the government implemented its biofuel policy in 2006, the policy regulation used was Presidential Regulation Number 5 (2006) which has less legal strength than the Law on Excise (see **Figure 6.1**). This means that biofuel policy regulation and subsequent related regulations cannot override excise policy which is higher in the regulation hierarchy. Thus, excise law is the regulation with which government authorities comply, which undermines biofuel policy.

As the second highest in the regulation hierarchy, the Excise Law would be difficult to amend. It would require the Indonesian Parliament to sit with the government, with both consenting to the proposed amendment. Furthermore, an excise tax exemption for bioethanol (FE) for the purpose of blending with fossil fuel, could potentially attract an intense debate of pros and cons in the Parliament due to the continued prevalence of ethanol abuse in society as described above. Based on my experience of law making, such a discussion could take months if not years which would be detrimental to the development of the domestic FE industry. This is because the bioethanol industry would still be taxed if it produced bioethanol for fuel purposes which then disincentives the industry in terms of growth.

This wider policy context which found biofuel policy (specifically that relating to bioethanol) unexpectedly at cross purposes with excise policy, created catastrophic impacts for the industry. In particular, small scale bioethanol producers who attempted to produce the product for fuel purposes were badly affected by the policy conflict. As a member of the Bioethanol Producers Association stated in a media interview:

> *"We just knew that ethanol (for fuel purposes) is associated with prohibited alcohol production, and subject to excise. Thus, we need to obtain complicated business licenses. Otherwise, we can be arrested by the police and pay a fine."*
>
> *(Setyo Budi, Member of APBI, BBC Indonesia 28 October 2012)*

From the excerpt above, it seems small scale bioethanol producers were not initially expecting their product to incur excise tax as they intended to produce bioethanol for fuel purposes. However, since small scale bioethanol producers were unable to produce fuel grade ethanol (as discussed in Chapter 5) their product was categorized as controlled alcohol production, which meant they needed to obtain a special licence just to sell their product.

The small-scale bioethanol producers already faced problems of limited feedstock input and lack of buyers, as Pertamina did not want to buy the non-fuel grade bioethanol produced. The conflict between biofuel and excise tax policies was the final blow and hundreds of small-scale bioethanol producers shut-down their operations (BBC Indonesia, 28 October 2012). Large scale bioethanol producers still produce bioethanol (FE), yet they only do so to fulfil the requirements of domestic industries that need this product for non-fuel purposes and are thus exempt from the tax. Meanwhile, Pertamina's demand for bioethanol (FE) is very limited due to the product being too expensive for the company to make a profit. This suggests that the excise tax embedded in the bioethanol (FE) price also disincentives the SOE from increasing its demand for the product.

Surprisingly, during the interviews, none of my respondents from amongst the government representatives, particularly those in the Ministry of Finance and Ministry of Energy and Mineral Resources, ever spoke about the excise tax being imposed on bioethanol for fuel purposes as a problem for biofuel policy implementation. This suggests that officials in the Ministry of Energy and Mineral Resources are not aware of the excise tax policy mechanism since it is not a key obligation that they understand it. Meanwhile, their Ministry of Finance counterparts do not appear to be aware that bioethanol can be used for fuel purposes.

Based on this observation, it is possible to suggest that officials in the respective ministries are focused on their own issues rather than comprehending the bigger picture. This is also suggestive of the difficulty of cross government cooperation in the policy implementation process, especially if there are different policies administered by different government bodies. Both ministries, with their respective authorities, are again unable to comprehend the problem and thus resolve it, which, in this context, would involve finding a solution for the excise tax being imposed on bioethanol.

However, instead of the Ministry of Finance and the Ministry of Energy and Mineral Resources collaborating to find the right solution for the tax imposed on bioethanol, the latter just issued another biofuel regulation. This policy was implemented through MEMR Decree Number 219 (2010), which regulated the disbursement of the government subsidies dedicated to the biofuel industry (**Figure 6.2**). This policy regulation was administered solely by the Ministry of Energy and Mineral Resources, thus minimizing the problems of policy conflict that happened with the other incentives given to the biofuel industry and avoiding the problem of tax on bioethanol. This policy was expected to help the biofuel industry to thrive, since the subsidy covered the difference between the production cost and the sale price which included all the taxes imposed on biofuel. Thus, the biofuel industry would be expected to make a profit and this would incentivise it to increase production.

Figure 6.2
Bioethanol Subsidy Schemes

Subsidy = Argus Price (FOB Thailand) * 5% * 788 kg/m^3 – Fuel Retail Price

Source: Based on the Ministerial of Energy and Mineral Resources Decree Number 219 (2010)

Based on **Figure 6.2**, the conversion cost for the bioethanol subsidy is the Argus Price with an additional profit margin of 5%. The Argus Price publication is *"a daily report that provides key international insights into the biodiesel, ethanol and feedstock markets"* (www.argusmedia.com, 2018). Thus, the government would use the nearest commodity market in the region that also sells bioethanol (FE) as a selling price benchmark for the domestic bioethanol (FE) market. A percentage (5%) is added that resembles the production cost and the profit margin for domestic bioethanol producers. Moreover, since biofuel is produced from feedstock that is measured by weight, a conversion factor is added to convert weight (kilogrammes) to volume (litres) which is a fixed amount. However, the conversion cost is a key problem for biofuel producers because it is lower than the actual cost of producing biofuel. As the Head of APROBI (*Asosiasi Produsen Biofuel*/Biofuel Producers Association) stated in a media interview:

> *"Domestic bioethanol production has stopped, because, the subsidy given is not enough to cover the production cost of bioethanol."*
>
> *(Paulus Tcakrawan interviewed by Tempo.co, 28 November 2010)*

Based on the above excerpt, the implementation of the biofuel subsidy policy has created the adverse consequence of the discontinuation of bioethanol (FE) production. The bioethanol industry was dealt a fatal blow as the government decision to use the foreign market to benchmark the price for domestic bioethanol production did not reflect the true cost for domestic producers of producing bioethanol. The foreign bioethanol market did not have the specific aspects that negatively impacted the industry in Indonesia such as the agrarian policy on feedstock (explained in Chapter 4) and the fragmentation of the domestic bioethanol market (explained in Chapter 5). The fact that bioethanol production ceased indicates that the subsidy that the government allocated to the domestic bioethanol industry was insufficient to cover bioethanol (FE) production costs. Since bioethanol companies did not want to sell their product at a price below the production cost, they chose not to produce fuel grade bioethanol for Pertamina as there was no profit in doing so.

The case of Indonesia's bioethanol programme and the useless incentives for biofuel producers (discussed above) highlight that there has been a contrasting outcome as compared to other biofuel case studies discussed in the literature (e.g. Boras Jr et al., 2011; Oliviera et al., 2017; Gillon, 2016; Wilkinson and Herrera, 2011). This can be explained when the political and policy contexts are examined, as they have been here. The examination has shown that there is an issue of overlapping policies with each administered by different government bodies (Fowler and Johnson, 2017). Such an issue has impeded the effectiveness of policy implementation particularly for policies that require inter-ministry coordination such as biofuels (Byrne et al., 2007).

The analysis further highlights the failure of the government to address the problem effectively. The Ministry of Energy and Mineral Resources chose to maintain the status quo and decided to implement a subsidy policy for the biofuel industry that was expected to be the solution for the entire problem engulfing the development of domestic biofuel. However, instead of resolving the problem, the subsidy policy only worsened it by providing a subsidy amount that did not cover biofuel production costs if producers chose to sell their product to Pertamina. For the biodiesel companies, they had another option available – to sell their product overseas due to the strong palm oil industry that provided an abundance of feedstock (see Chapter

5). However, in contrast, the combination of insufficient government incentives and absence of an integrated agro-industry, along with a fragmented bioethanol market caused the bioethanol industry to cease production of fuel grade bioethanol for fuel purposes, effectively ending the bioethanol programme in Indonesia.

The Indonesian bioethanol programme indicates the challenges faced by the different ministries to comprehensively formulate a policy so that the domestic biofuel industry can thrive - and is also suggestive of the complicated underlying political economy in Indonesia. Fowler and Johnson (2017) argue the need for different government institutions to sit down together and collaborate to resolve their common problems. Their research found that the failure of government institutions to do so had reduced the policy effectiveness of the US energy policy, where inter-governmental bodies were in dispute over who had the right to change the electricity tariff. The case of bioethanol in Indonesia also highlights problems of policy conflict between different government bodies which has resulted in policy failure, rather than just policy ineffectiveness. The government officials from the Ministry of Finance and the Ministry of Energy and Mineral Resources were unable to come together to find an appropriate solution when formulating the biofuel policy. This suggests that collaboration between government bodies could potentially settle policy conflict, whilst lack of collaboration and policy ignorance will eventually impact the overall outcome of policy implementation.

The adverse impact of the implementation of subsidies for the biofuel industry has further shown the complicated politics behind the construction of biofuel policy. I argue that these are, in part, related to the government's political commitment to implementing the policy. This suggests the necessity for political elites such as the President of the Republic of Indonesia to intervene, as this involvement of high-level officials could potentially settle the problem - which itself suggests insights regarding the underlying politics that have shaped biofuel policy. In the next section I will address the wider political context for the developments highlighted thus far and examine processes of policy implementation to develop further insight into the issue.

6.3. Uncovering the Politics behind Biofuel Policy

Thus far, this chapter has discussed the failure of different government bodies to harmonize the implementation of biofuel policy. These analyses show the tendency of different government ministries to create policies according to their individual authority without seeing the bigger picture. Following Fowler and Johnson's (2017) argument, there is a need for cross ministry coordination to resolve the problems that arise during policy implementation. In the context of biofuels, Stattman et al (2013) conducted a study in Brazil and their research showed that biofuel policy is not a policy formulated by a single government body. Instead, it is a comprehensive policy where multiple government bodies with different types of authority are involved. As such, there is a need to coordinate at national level to ensure each government body consistently implements the biofuel policy (Byrne et al., 2007).

Thus, I will move the analysis to the high-level politics of energy in Indonesia, which is represented within a government agency called *Dewan Energi Nasional* (DEN) or the National Energy Board. This government body has tasks stipulated by a Presidential regulation as follows:

> *"a. design and formulate national energy policies to be implemented by the government with parliament's approval;*

b. formulate general national energy plans;

c. formulate steps to overcome crisis conditions and energy emergencies; and

d. supervise energy policy implementation across the intragovernmental sector."

(Presidential Regulation Number 26/2008, Article 3)

DEN is led personally by the President of the Republic of Indonesia with members ranging from ministers to public stakeholders (see **Table 6.2**). DEN members are appointed and dismissed by the President and members from the stakeholders' side must also have Parliament's consent before being appointed by the President.

Table 6.2
Structure of the National Energy Board (DEN)

<table>
<tr><th colspan="2">Board of Leaders</th></tr>
<tr><td colspan="2">Chairman: President of the Republic of Indonesia</td></tr>
<tr><td colspan="2">Vice Chairman: Vice President of the Republic of Indonesia</td></tr>
<tr><td colspan="2">Executive Director: Minister of Energy and Mineral Resources</td></tr>
<tr><th colspan="2">Members</th></tr>
<tr><th>Government</th><th>Stakeholders</th></tr>
<tr><td>Minister of Finance
Minister of Planning and Development
Minister of Transportation
Minister of Industry
Minister of Agriculture
Minister of Research, Technology and Higher Education
Minister of Environment and Forestry</td><td>8 people representing stakeholders consisting of
2 university academics
2 Practitioners in the energy industry
1 expert in energy technology
1 environmentalist
2 public energy users</td></tr>
</table>

Source: Based on Presidential Regulation Number 26 (2008)

Based on the excerpt from the Presidential Regulation, DEN has authority to supervise energy policy during formulation and implementation and when involving different government bodies. Moreover, **Table 6.2** also shows that both the Minister of Finance and the Minister of Energy and Mineral Resources are included on the board. This suggests that cross ministry coordination is expected when formulating energy policy, such as policies relating to biofuels - and any problems emerging when formulating such policy should be resolved during DEN meetings.

The issue of excise tax being imposed on bioethanol for fuel purposes was of concern to one DEN member (from the stakeholders' side) when he made a media statement:

> *"To encourage the use of bioethanol, it is expected that the Minister of Finance will reconsider the excise imposed to use ethanol as fuel."*
>
> *(Syamsir Abduh, Kontan.co.id, 12 October, 2017)*

In this excerpt, the DEN member appeals to the Minister of Finance to urgently review the policy on excise tax for bioethanol (FE). However, the respective DEN member made his statement in the media on 12 October 2017, but the domestic bioethanol industry had already stopped producing bioethanol (FE) for Pertamina back in 2010. This suggests that the issue may have been discussed within a DEN meeting, but any attempt to address the excise tax on bioethanol (FE) was unsuccessful, as there is no obvious action from the government. There is an insightful statement by respondent R9:

> *"During regular DEN meetings, members of DEN from the government side are usually represented by their subordinates who are high ranking government officials such as echelon 1 or the minister's expert staff. As representatives of their respective ministers, their decisions are supposed to mirror their minister's decision. However, in a larger forum session attended by the ministers, decisions made by their representatives are usually changed by their bosses (the respective ministers). Thus, the*

discussion that already reached a conclusion could go back to zero and we must discuss again from the beginning. This situation also happens in assembly meetings with the President."

(R9, Member of National Energy Board, May 2017)

According to Presidential Regulation Number 26 (2008), DEN should have an assembly meeting led by the President at least twice a year and regular meetings led by the Minister of Energy and Mineral Resources once every two months. Furthermore, to increase their working efficiency, the Minister of Energy and Mineral Resources can create a task force which consists of members from the stakeholder side with high-level government officials appointed by their respective ministers. These government officials are supposed to have the same authority as their respective chief in terms of making decisions and collaborating with other members to resolve issues around energy policy, such as the ineffective fiscal incentives given to the biofuel industry and the tax imposed on bioethanol. However, the statement by respondent R9 suggests that consensus reached in meetings with these government officials is often annulled or altered in the wider forum attended by Ministers. One plausible explanation for this is that every DEN member from the government side maintains their own views of a particular issue in accordance with their authority and disregards the bigger picture.

Since DEN is led by the President of the Republic of Indonesia, every dispute between members of DEN, particularly the Ministers, is supposed to be settled in the meeting led by the President. However, this aim has never been reached as Respondent R9 further stated:

"Initially, the President said that he would focus on completing RUEN (the National Energy General Plan). But, he started to have doubts since there were still debatable issues. Thus, we have to review again and he refused to sign before everything is clear."

(R9, Member of the National Energy Board, May 2017)

R9's statement indicates that the President is reluctant to meddle if there is a dispute in the formulation of energy policy and he prefers his subordinates (the Ministers) to resolve disputes on energy related issues. Thus, it is suggested that the President wants his Ministers to compromise and resolve any problems that emerge. Yet, there are still problems (as discussed in the earlier section of this chapter) suggesting that the Ministers are still attached to their own views of the policy in accordance with their authority and with little compromise. This creates a huge problem as political elites, such as the President and the Ministers, do not have a strong commitment to implementing energy policies, such as the biofuel policy. R9 articulated this in another statement in which he questioned the President's actions rhetorically:

"That is what happened so far when there were problems; we brought the issue to the plenary session with the President. For the President, well, we just give him the pros and cons of every option and he will have to make the decision. The President can respond either with (presidential) instructions or other policy instruments. But, in this democratic system he (the President) cannot be authoritarian or perhaps he is just doubtful (in making decisions). This can happen due to various reasons. It can be that there is conflict of interest with his constituents or he has a political debt with his campaign supporters."

(R9, Member of the National Energy Board, May 2017)

Based on the above excerpt, it is suggested that even the highest political authority such as the President can be indecisive in making an executive decision for political reasons. This can hinder political efficiency in resolving pressing issues such as the biofuel policy problems discussed above. As R9 further stated:

> *"Energy affairs are directly related to politics. So, sometimes the policy made was good, but implementing it was rather half hearted."*
>
> *"Even though the policy is made, there is a serious problem namely leadership commitment in terms of implementation as some inconsistency remains in the policy."*

(R9, Member of the National Energy Board, May 2017)

The statement by respondent R9 implies that the government's intention to pursue a biofuel policy is a positive response to help resolve Indonesia's energy security issue, but that its implementation is less than effective. He further explains that although the government has made policies to develop the domestic biofuel industry, some policy inconsistency exists and there is not an effective response to resolve it. This suggests that there is insufficient political commitment, particularly from the political elites, in developing the biofuel industry - R9 describes it as a lack of "leadership commitment". This relates to the contested political issues evident in biofuel policy implementation - there is the intention to develop biofuel, but there is no strong commitment to fulfil the intention.

The insufficient political support of the political elites has created negative impacts for the government officials who are drafting the policy documents. As respondent R11 stated:

> *"We need a clear direction in developing biofuel policy and that could come from a Government Regulation or Presidential Regulation. If we still insist on doing it without support from any of these regulations, we are susceptible to claims of criminalization (should the policy fail)."*
>
> *(R11, Government officials' representative, May 2017)*

In the excerpt above, the respondent emphasizes the importance of producing or drafting a regulation that is supported by a higher-level regulation, which he implies could include a policy document signed by the President. The existence of such a document is essential as government officials need to take due care in formulating a regulation, particularly if it involves spending government funds for example designing a subsidy policy for the biofuel industry. A biofuel policy that regulates the mandatory blending target and the subsidy are only regulations at a ministerial level, which is lower in hierarchy than a presidential regulation (see **Figure 6.1** above). This is in contrast to fossil fuel subsidies, as these are stipulated by a presidential regulation (Presidential Regulation Number 55, 2005). Creating a biofuel subsidy policy without any higher-level regulation to support it could put certain high-ranking government officials in a precarious position. This is because there is no justification that could support their decision should the policy fail and the government suffer loss of public funds; the officials involved in the formulation of the respective policy regulation would ultimately bear responsibility for this.

A further important point of discussion when seeking to uncover the politics shaping biofuel policy is the government's vested interests in the SOE - Pertamina. The Ministry of Energy and Mineral Resources is not only in charge of administering the biofuel subsidy policy but is also in charge of administering fossil fuel subsidies. However, unlike the biofuel subsidy policy that hampers the industry, the fossil fuel subsidy is essentially generating revenue for its recipient - Pertamina - which is the reason the SOE is hesitant to buy biofuel to partially substitute subsidized fossil fuel (as discussed previously). This is again suggestive of a lack of political will within biofuel policy implementation, since the government has failed to address the differential implications of subsidy schemes for biofuels and fossil fuels. As R9 states:

> *"There is a perception that there is a desire by some people, let's just say oil "mafias" to disturb this (biofuel business). Because, if the utilization of biofuel increases in the domestic market, fossil fuel imports will decrease which greatly impacts their business."*
>
> *(R9, Member of the National Energy Board, May 2017)*

The above excerpt provides a clue that there are certain actors involved with the oil industry who potentially meddle in the formulation of policy for developing biofuel. Interestingly, respondent R1 explained:

> *"Biofuel is categorized as oil and gas, so it must be discussed by the oil and gas directorate."*
>
> *(R1, Biofuel company representative, May 2017)*

R1 highlights that biofuel was initially considered as part of the oil and gas policy and discussed by officials from the Directorate General of Oil and Gas under the Ministry of Energy and Mineral Resources. Thus, even within this Ministry biofuel policy formulation involves people who are already accustomed to oil policy development. The evidence becomes clearer as the regulation states:

> *"The price index for oil fuel markets and the price index for the biofuel market is set every month by the Director General of Oil and Gas."*
>
> *(*Ministerial *of Energy and Mineral Resources, Decree Number 219, 2010)*

The excerpt from this ministerial regulation indicates that the biofuel subsidy policy was formulated by government officials from the Directorate General of Oil and Gas whose main task was regulating the oil business. Moreover, the leader of this unit is the person in charge of deciding the price indexes that determine the level of government subsidy (see **Figure 6.2** and **Figure 5.6**). Added to this, the same person also holds a position as a member of the Board of Commission at Pertamina (www.finance.detik.com, 6 May 2010). Thus, there is a potential conflict of interest between designing the biofuel and fossil fuel policies. This is not a straightforward story about vested interests *per se* but attests to the deeper roots of incumbency. The notion of incumbency can be seen in the literature on energy transition (Geels et al., 2017) and socio-technical change (Bijker, 1994) where deployment of a new low carbon energy initiative is seen as a threat to the already established fossil based energy industry - in this context, biofuels would have a disruptive business effect on fossil fuels. Important to this story are the skills and positions of people who have worked with(in) the oil industry for many years. Such existing entanglements are not easily shifted or reshaped to the delivery of support for new forms of energy that appear to pose a threat to the existing industry.

Having a double position, such as an elite government official and commissioner of a state-owned enterprise, is common practise in Indonesia as stated by two government Ministers in media interviews:

> *"This government ownership (of the SOE) needs to be represented by the government itself. So, if the government has a company, it is common to put government officials in this company."*
>
> *(Asman Abnur, Minister of Empowerment of State Apparatus and Bureaucratic Reform in an interview with www.industry.co.id, 8 July 2017)*

> *"In my opinion, for supervising and coaching purposes, there is no harm in having a double position (such as for a government official to be an SOE commissioner)."*
>
> *(Rini Soemarno, Minister of State-Owned Enterprise in an interview with www.tribunnews.com, 12 June 2017)*

Mr. Abnur's statement indicates that appointing high-ranking government officials as commissioners of a state-owned enterprise is not just common, but also necessary. Moreover, Mrs. Soemarno's statement resonates with Mr. Abnur's statement as she also emphasizes that there is no conflict of interest for those with a double position, as a commissioner's task is only to supervise and not meddle in the SOE's operations. However, having a double position is also controversial as stated by the Head of the Corruption Eradication Commission:

"If you pay attention to the Law on Public Services, actually a government official cannot be a company commissioner."

(Agus Raharjo in an interview with www.jurnas.com, 17 November 2016)

The excerpt above suggests that not all political elites in Indonesia agree with double positions such as a government official being an SOE commissioner. However, such controversies are beyond the scope of this thesis. Although Mrs. Soemarno claims that having a double position will not create a conflict of interest, when being in such a position it is always plausible that the incumbent may have an interest in creating government policy that favours the respective SOE. In the context of biofuel policy, it is customary for high ranking government officials from the Ministry of Energy and Mineral Resources, specifically those in the Directorate General of Oil and Gas, to be commissioners for Pertamina or its subsidiary companies. Thus, whilst the double position held by certain individuals in this Ministry may not affect Pertamina's company policies, it may affect the policy the government makes in terms of its implications for Pertamina.

Since the above analysis indicates insufficient political commitment from the top political elite, particularly in directing the way the subsidy should be disbursed for the biofuel industry, favouring Pertamina could prove a preferable situation for those in charge of formulating the biofuel subsidy. For Pertamina, the subsidy received will become its revenue - the government could tax it and the government as the owner of Pertamina could also claim a portion of the revenue as a yearly dividend. This means a significant portion of the government's disbursed funds will return to the government budget, while the remainder of the funds will become an asset for Pertamina (which is itself a government asset). Conversely, the biofuel companies are owned by private stakeholders and thus a portion of the government subsidies will become part of the companies' revenue; this money will only return to the government in the form of taxes, while a significant amount of the subsidy will be enjoyed by the companies. Thus, it is more beneficial for government officials to formulate a subsidy policy that benefits Pertamina rather than the private biofuel industry, as the government would favour its own business entity.

Even though the biofuel subsidy policy was formulated by people who have ties with Pertamina, the government amended the Ministerial of Energy and Mineral Resources Decree Number 219 (2010) by issuing the Ministerial of Energy and Mineral Resources Decree Number 3053 (2011). This regulation was issued in February 2011 and stated:

> *"The price index for oil fuel markets is set every month by the Director General of Oil and Gas and the price index for the biofuel market is set every month by the Director General of New and Renewable Energy and Energy Conservation."*
>
> *(*Ministerial *of Energy and Mineral Resources, Decree Number 3053, 2011)*

The amendment of the ministerial regulation was due to bureaucratic reform in the Ministry of Energy and Mineral Resources with the establishment of the Directorate General of New and Renewable Energy and Energy Conservation (MEMR Regulation Number 18, 2010). The regulation amendment, as well as the reform in the Ministry of Energy and Mineral Resources, was expected to resolve the problem of the government under-subsidizing the biofuel industry. However, the respective biofuel subsidy scheme did not change until March 2014, when the subsidy scheme remained the same for bioethanol but changed for biodiesel. Yet, this change still did not truly favour the biodiesel industry, since the amount of subsidy given would depend on the price of fossil fuel instead of the actual cost of producing biodiesel.

The literature on biofuel governance has examined the way government interests in developing biofuel to resolve energy security issues intersects with private sector interests in profiting from such a policy (Bailis and Baka, 2011; Oliviera et al., 2017). However, the research does not discuss in depth the political processes involved in biofuel policy. There are a few exceptions, in particular the study by Stattman et al. (2013) on Brazilian biofuel politics. Their study found that the Brazilian government's success in implementing its biofuel policy was due to strong commitment from political elites. In the past, there was also political objection to Brazil's biofuel policy – for example, there was reluctance from Brazil's state-owned oil company and car industry, as well as the domestic sugar industry which indicated that not all stakeholders supported the biofuel policy. However, Brazil's political elites were able to compel all stakeholders to be on the same side to support the growth of the biofuel industry.

The analysis in this section suggests that the Indonesian government did not follow the example of the Brazilian government. Instead of adopting a decisive decision to implement a biofuel policy, the President preferred Ministers to compromise and find solution to problems that emerged relating to energy issues and biofuel in particular. Such a condition created a 'status quo' as Ministers preferred to retain their own views about the biofuel industry and as such tended not to compromise. This created circumstances that caused the government officials in charge of formulating policy to favour the fossil fuel business, as they had an existing interest in and understanding of this business.

As such, it is plausible that a conflict of interest emerged in favour of the fossil fuel business where the government officials prefer to formulate a subsidy policy beneficial for Pertamina rather than the biofuel industry. Providing a subsidy for Pertamina is in the government's interest as the company is government owned. Meanwhile, the biofuel industry is privately owned, which means that providing a subsidy to this industry would potentially put the government officials in a precarious situation, as there is no support for such a subsidy from a higher-level regulation. Strong "leadership commitment" as mentioned by respondent R9 could potentially have suppressed the conflict of interest, as those who formulated the biofuel policy would need to follow the high-level policy direction.

6.4. Summary and Conclusion

Studies using the lens of political ecology have shown that in many developing countries, government development policy has become one of the most effective instruments in increasing economic growth (Baird and Quastel, 2015; Neuman, 2001; Smits, 2015; Sovacool, 2010). In terms of biofuel policy development, several studies indicated how the industry has thrived due to government policy interventions, such as through mandatory blending targets and subsidies (Oliviera et al., 2017; Stattman et al., 2013). For example, the study by Stattman et al (2013) highlighted the importance of political elites in ensuring biofuel policy success. Moreover, other studies using the lens of agrarian political economics have confirmed that government policies creating targets for biofuel use in domestic markets have caused rapid growth in biofuel production and its feedstock (Wilkinson and Herrera, 2011; Gillon, 2016).

These previous studies emphasise that government policy is an essential factor contributing to rapid growth in domestic biofuel industries. However, the studies are mostly focused on the ultimate impact of government policy on the environment and groups of people living in that environment (e.g. Fernandes et al., 2010; Baird and Quastel, 2015; Neuman, 2001). The underlying politics within the policy-making process has been under-explored within these studies - with a few exceptions such as Stattman et al. (2013). However, this latter study, despite showing that the strategic position of political elites influenced the biofuel policy trajectory, did not discuss in-depth the biofuel politics of the elite.

In this chapter, I have highlighted the underlying political economy behind biofuel policy implementation in Indonesia. The government showed its commitment in implementing a biofuel policy through the implementation of mandatory blending targets and subsidies to increase the growth of the domestic biofuel market. However, the underlying politics of Indonesia’s biofuel policy have shown that policy and political commitment should not be conflated. Without strong political commitment from top elite figures, such as the President, a policy can lack effectiveness. In this context, the biofuel policy provided incentives that not only failed to stimulate the growth of the industry, but also actually hampered its development. To be more precise, although the government implemented its biofuel policy, its subsequent actions did not follow the same trajectory to support the policy.

The biofuel case study of Indonesia has increased our understanding that political commitment, particularly from the top political elites, is a key factor for a policy to achieve success. This suggests that political elites are the most important actors within government policy-making as they have the power and authority to decide the trajectory of the policy. Although the case of Indonesia’s biofuel policy cannot be generalized to other countries, it provides a plausible explanation for success or lack of success of biofuel policies more widely – that is, commitment from political elites and not merely the implementation of a biofuel policy by the respective government.

The inconclusive biofuel policy in Indonesia created an opportunity for large agro industries, notably the palm oil industry, to influence the government's biofuel initiatives. This led to the formation of an agro-fuel alliance between the biodiesel industry and the large palm oil industry, which, arguably, eventually shifted the trajectory of Indonesia's biofuel policy towards favouring and becoming dependent upon the palm oil industry. This shifting of power that influenced the government policy trajectory forms the focus for the next chapter.

Chapter Seven

The Politics of Biofuels: Part II

The Government, Policy and the Agro-Fuel Alliance

This chapter attempts to further explore how politics and policy issues enacted by actors involved in the biofuel energy nexus have consequences for implementation and practice. I argue that insufficient political commitment (discussed in the previous chapter) in pursuing biofuel policy has contributed to the government excessively favouring large agro-industries, particularly multinational agro companies and eventually reshaping policy in accordance with the interests of the respective agro companies. This situation has changed the trajectory of Indonesia's biofuel policy. The policy that was initially meant to resolve energy security issues, rural poverty, and environmental change has become the policy that benefits only large agro companies.

Again using the lenses of political ecology and agrarian political economics as in the previous chapter, I will apply data from my interviews, document analysis, and observations during field research, as well as my personal experience working as a government official involved with government policy implementation related to the palm oil industry. I will focus the analysis on the politics and policies of both the palm oil and biofuel industries which led to the constitution of agro fuel alliances and the shifting of Indonesia's biofuel policy trajectory. The analysis in this chapter, in particular, aims to develop the work of Oliviera et al. (2017), which argues for the need to examine the underlying political economy of biofuel politics in order to understand processes that shape the State's patronage over large agro-industry, as well as the resulting socio-ecological problems that have been critiqued by political ecologists and agrarian political economists (e.g. Searchinger et al., 2008; Fargione et al., 2008; Fernandes et al. 2010; Boras Jr et al., 2011).

This chapter is composed of three sections. The first section analyses government policy concerning the palm oil industry and argues that the policy tends to favour large agro palm companies – and thus has underpinned the formation of agro-fuel alliances in the biodiesel sector. The second section analyses the dominance of the palm oil industry over the biodiesel industry – highlighting that insufficient political will, as regards implementing biofuel policy, that has created this condition. The third section analyses this dominance in relation to the fall of the CPO price at the end of 2014, which I argue has paved the way for the palm oil industry to influence the government's biofuel policy.

There are two key analytical points in this section. Firstly, it will analyse the way the palm oil industry took advantage of a lack of political commitment to the biofuel policy and influenced the government in its policy making. Secondly, it will analyse the impact of the palm oil industry on the government's biofuel policy which effectively altered Indonesia's policy to favour palm oil-based biodiesel. The chapter concludes by arguing that large agro-industry has the ability to influence government policy in accordance with its own interests, particularly if there is weak political commitment in implementing the biofuel policy.

7.1. Forging Agro-Fuel Alliances: Government Interest in the Palm Oil Industry

This section focuses on the important facet of the biofuel nexus where agro-fuel alliances are created – but not because the government is implementing a biofuel policy. Instead, this outcome is due to the government's intention to develop a derivative industry from palm oil which has caused the large palm oil industry to seek opportunities in the biofuel sector. This policy, which is known as the Palm Oil Down-Streaming Policy, would eventually influence the biofuel policy trajectory and alter it into a policy heavily influenced by the large palm oil industries.

Agrarian political economists have shown that large agro industries start to consolidate their businesses when the government implements biofuel policies such as those in Brazil (White and Dasgupta, 2011) and the US (Gillon, 2010). These studies found that agro industries used biofuel policies as a new market opportunity leading to agro-fuel alliances. However, Oliviera et al. (2017) go further in their analysis, beyond a focus on the underlying political economy of biofuel policy, and instead emphasise that agro-fuel alliances occur as a result of multifaceted government policies. Thus, this first section of the chapter will aim to further develop Oliviera et al's (2017) argument that biofuel policy is developed based on corporate interests utilising economic power and government concerns about resolving energy security problems to advance corporate interests (p.9). In other words, I will not discuss the benefits of biofuel policy for large corporations as this has been covered in the previous literature (e.g. Hollander, 2011; Wilkinson and Herrera, 2011; Oliviera et al., 2017). Instead, I will focus on the underlying political economy that leads the government to create a biofuel policy that will eventually benefit large agro companies.

As discussed in Chapter 4, the implementation of the Core Estate Policy from the 1970s led to the palm oil industry becoming an industrial giant, as the policy successfully made farmers and smallholders into an extension of private plantations. The smallholders' involvement in the palm oil industry is essentially a mutual relationship as the latter helps the former to establish their plantation and in turn, the former supplies fresh palm bunches to the latter to process into crude palm oil (CPO). As a result, private palm oil industries can produce CPO in large quantities (see also **Figure 4.6** in Chapter 4) far exceeding domestic consumption which is approximately 5 million tons annually (MEMR, 2016).

CPO is mainly used to produce cooking oil for the domestic market and its excess supply is sold overseas - as respondent R22 stated:

> *"The national refinery capacity is around 15 million tons per year. Yet, only 8 million tons is used to produce cooking oil because domestic demand is only 5 million tons and the remainder is exported."*
>
> *(R22, Palm oil companies' representative, May 2017)*

The respondent's statement reaffirmed the data from the Ministry of Energy and Mineral Resources by asserting that any excess of cooking oil and CPO produced domestically is sold to the overseas market. Meanwhile, the national production of CPO has increased from 5.4 million tons in 1998 to 11.8 million tons in 2005 (Ministry of Agriculture, 2014). Thus, there has been a huge quantity of CPO sold on the overseas market since the beginning of the 2000s. However, CPO is still considered as a raw material that can be used to support other industries, such as food, soap, cosmetics and so on. The product is, therefore, in high demand even when its price is relatively high and tends to bounce back if its price decreases (**Figure 7.1**). This ensures that the palm oil industry manages to gain substantial profit, particularly when the price of CPO is high.

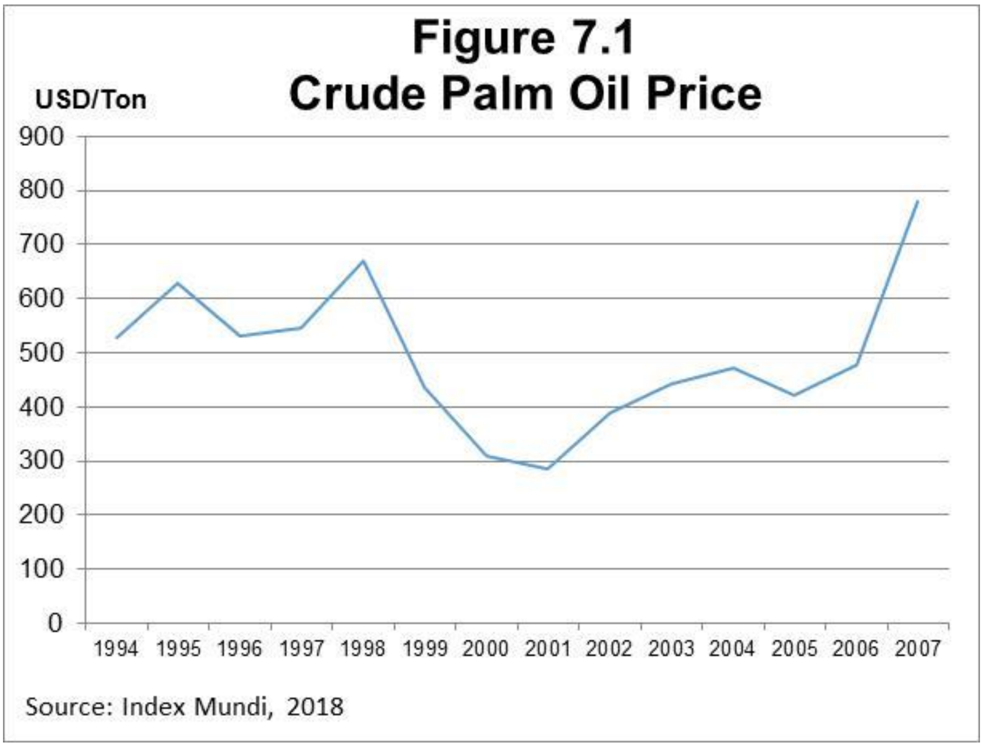


Table 7.1
Export Tax Rate on Palm Products (%)

1	Fruits and Fresh Fruit Bunches	3%
2	Crude palm oil	3%
3	Crude olein	1%
4	RBD Palm oil	1%
5	RBD Palm olein	1%

Source: Based on Ministerial of Finance Regulation Number 66 (2001)

Based on analysis of policy documents about the export tax on CPO products, the government started to impose tax on this product from 2001. The government imposed an export tax on palm oil and its derivative products with a higher tax rate for the raw product, such as CPO and fresh palm bunches, and a lower tax rate for the processed products, such as cooking oil and olein[14] (**Table 7.1**). The higher tax rate imposed on the raw products will discourage palm oil companies from directly exporting CPO since this product will become expensive for overseas consumers

[14] Palm oil processing yields many derivatives compound where RDBPO (refined, deodorized and bleached palm olein) also known as cooking oil along with palm olein are the most common derivatives product produced by palm oil industry (Minal, 2014).

and reduce the prospect that they will buy it. Conversely, the lower tax rate for the processed product will make it somewhat expensive for overseas consumers, but still competitive enough that they are likely to buy processed CPO products.

The government's progressive export tax structure may relate to its intention to encourage palm oil industries to process raw products, rather than directly export them. However, there is no consideration written in the Ministerial of Finance (MoF) Regulation Number 66 (2001), as well as its higher-level regulation, which is Law Number 10 (1995) on Customs, about the government's intention of having a progressive export tax structure. Thus, one of the most plausible explanations is that the government's intentions in imposing an export tax on CPO and its derivative products was merely to increase government revenue. This soon changed, however, as the Law on Customs was amended in 2006 and clearly stated the purpose of imposing the export tax:

> *"Export duty is imposed on exported goods with the aim to:*
>
> *a. guarantee the fulfilment of domestic demand;*
>
> *b. preserve natural resources;*
>
> *c. anticipate drastic price increases in certain export commodities on the international market; or*
>
> *d. maintain the stability of the prices of certain domestic commodities."*
>
> *(Law Number 17, 2006, Article 2A)*

The amended Law on Customs suggests that the government's interest in the palm oil industry expanded from a mere source of revenue into a somewhat larger scheme. This included prioritizing the domestic demand for CPO which was expected to stimulate growth in palm oil derivatives and eventually lead to an increase in economic growth at national level. Thus, with the Law on Customs amendment, the government had a clear intention to develop the derivative industries related to palm oil – this policy is known as the Palm Oil Down-Streaming Policy.

However, the implementation of the Palm Oil Down-Streaming Policy does not necessarily mean that the government was already keen for the palm oil industry to support the biofuel industry. Indeed, there is no specific consideration within the Law on Customs about supporting the biofuel industry, which signifies that the government's main aim was to generally develop all industries needing palm oil as their feedstock. Moreover, the Law on Customs offered flexibility because it only provided the reason for the government to implement the Palm Oil Down-Streaming Policy. The fiscal instrument itself was in the control of the Ministry of Finance through the export tax tariff mechanism. This would give flexibility for the government to amend the tax tariff structure at any time in accordance with the dynamic of economic conditions. The subsequent amendments included changes in the tax tariff, increases in the number of taxable goods, and an adjustment related to the higher level regulation.

Thus, when the price of CPO skyrocketed from USD599/MT in January 2007 to USD821/MT in August 2007 (Index Mundi, 2018), the Ministry of Finance amended the export tax rate through implementation of MoF Regulation Number 94 (2007). This regulation significantly changed the export tax structure for CPO and its derivative products (**Table 7.2**) as it harmonized the progressive tax rate in accordance with the high price of CPO in the international commodity market. In this regulation, palm oil is divided into 13 different products with much more detail than the previous regulation. The changes in the tariff structure along with its complexity show that the government could flexibly adjust the export tax to accommodate the dynamics of international economic conditions, while also keeping on track with its Palm Oil Down-Streaming Policy.

Table 7.2
Export Tax Rate on Palm Products (%)

	Products / **Price**	<US$550 /ton	<US$650 /ton	<US$750 /ton	<US$850 /ton	>US$850/ ton
1	Fruits and Fresh Fruit Bunches	40.0	40.0	40.0	40.0	40.0
2	Crude palm oil	0.0	2.5	5.0	7.5	10.0
3	Crude olein	0.0	2.5	5.0	7.5	10.0
4	Crude stearin	0.0	2.5	5.0	7.5	10.0
5	Crude palm kernel oil	0.0	2.5	5.0	7.5	10.0
6	Crude kernel stearin	0.0	2.5	5.0	7.5	10.0
7	Crude kernel olein	0.0	2.5	5.0	7.5	10.0
8	RBD Palm olein	0.0	2.5	5.0	7.5	10.0
9	RBD Palm kernel olein	0.0	2.5	5.0	7.5	10.0
10	RBD Palm kernel oil	0.0	1.5	4.0	6.5	9.0
11	RBD Palm stearin	0.0	1.5	4.0	6.5	9.0
12	RBD Palm kernel stearin	0.0	1.5	4.0	6.5	9.0
13	RBD Palm oil	0.0	1.5	4.0	6.5	9.0

Source: Based on Ministerial of Finance Regulation Number 94 (2007)

It is still unknown why the structure of the export tax rate changed significantly between the 2001 and 2007 policies (as shown in **Table 7.1** and **Table 7.2).** However, it is implied that government officials in the Ministry of Finance, particularly those involved with the export tax regulation, were aware of the multifaceted products that the palm oil industry could produce. Moreover, the implementation of MoF Regulation Number 94 (2007) shows that the government had an increased interest in the agro-palm industry. The complexity of this new tax structure suggests two possibilities: the government is either aware that the domestic industry needs the palm oil derivatives; or the tariff structure changes were applied as a means to encourage the palm oil industry to build these derivative industries. Despite the fact that this research does not investigate in depth the outcome of the Palm Oil Down-

Streaming Policy, it is important to note that the government expected that the policy would increase economic growth and reduce unemployment due to increased investment in establishing factories to produce palm oil derivatives.

The next amendment to the export tax regulations is important for the biodiesel industry since it incorporates biodiesel within CPO derivative products (**Table 7.3**). Interestingly, this MoF regulation was implemented on 7th February 2008 which is earlier than the mandatory blending target regulation issued on 26th September 2008 (MEMR Regulation Number 32, 2008; MoF Regulation Number 9, 2008). This suggests that the change in export tax structure in the Palm Oil Down-Streaming Policy was not necessarily implemented as a means to support the biofuel policy.

Table 7.3
Export Tax Rate on Palm Products (%)

	Products / **Price**	<US$550 /ton	<US$650 /ton	<US$750 /ton	<US$850 /ton	<US$1,100/ton	<US$1,200 /ton	<US$1,300 /ton	>US$1,300 /ton
1	Fruits and Fresh Fruit Bunches	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
2	Crude palm oil	0.0	2.5	5.0	7.5	10.0	15.0	20.0	25.0
3	Crude olein	0.0	2.5	5.0	7.5	10.0	15.0	20.0	25.0
4	Crude stearin	0.0	1.5	4.0	5.5	9.0	13.0	18.0	23.0
5	Crude palm kernel oil	0.0	1.5	4.0	5.5	9.0	13.0	18.0	23.0
6	Crude kernel stearin	0.0	1.5	4.0	5.5	9.0	13.0	18.0	23.0
7	Crude kernel olein	0.0	1.5	4.0	7.5	9.0	13.0	18.0	23.0
8	RBD Palm olein	0.0	2.5	5.0	7.5	10.0	15.0	20.0	25.0
9	RBD Palm kernel olein	0.0	2.5	5.0	7.5	10.0	15.0	20.0	25.0
10	RBD Palm kernel oil	0.0	1.5	4.0	5.5	9.0	13.0	18.0	23.0
11	RBD Palm stearin	0.0	0.5	3.0	4.5	8.0	11.0	16.0	21.0
12	RBD Palm kernel stearin	0.0	0.5	3.0	4.5	8.0	11.0	16.0	21.0
13	RBD Palm oil	0.0	1.5	4.0	5.5	9.0	13.0	18.0	23.0
14	Biofuel	0.0	0.0	0.0	2.0	2.0	5.0	5.0	5.0

Source: Based on Ministerial of Finance Regulation Number 9 (2008)

Instead, it is suggested that the amendment in the export tax regulation (see **Table 7.2** and **Table 7.3**) was due to the lobbying of officials in the Ministry of Finance by the biodiesel companies. One respondent stated:

> *"APROBI was established in 2006 and this association assisted the government in making regulations related to biofuels such as pricing, financing, specifications and finally blending in 2008."*

(R1, Biofuel company representative, May 2017)

Respondent R1 suggested that it was biofuel companies (i.e. APROBI) that initially lobbied the government by approaching different Ministries in an attempt to encourage the government to create its biofuel policy in accordance with what they wanted. This suggests that biofuel companies had also approached government officials in the Ministry of Finance, as part of their discussions with the government involved financing and specifications for biofuel. However, this also suggests that MoF Regulation Number 9 (2008), which includes biodiesel as a palm oil derivative, may not be correlated with MEMR Regulation Number 32 (2008), as it is plausible that the biofuel companies discussed these matters separately with the respective government officials. Thus, despite being beneficial to the biofuel industry, particularly the biodiesel industry, MoF Regulation Number 9 (2008) still serves as an economic policy for the palm oil industry, rather than being part of the biofuel policy. Nevertheless, this MoF regulation would be the crucial government policy that led the palm oil industry to enter the biodiesel sector - as respondent R1 also stated:

> *"Palm oil companies only entered the biodiesel industry when the regulation existed."*

(R1, Biofuel companies' representative, May 2017)

Based on the respondent's statement, it is suggested that the palm oil industry expanded into the biodiesel sector due to the change in the export tax structure implemented by the Palm Oil Down-Streaming Policy in 2008. This is supported by evidence from the GAIN Report (2011, p.8) as it shows the number of biodiesel factories increased from 7 in 2007 to 14 in 2008 and that production more than doubled in that period. This significant increase in the biodiesel sector indicates that palm oil companies had started to expand into the biodiesel business.

The significant increase in the number of biodiesel factories along with their production in just a one year period (2008) indicates that a policy implemented during the year encouraged the palm oil industry to bond with the biodiesel industry. Both the Mandatory Blending Policy and the Palm Oil Down-Streaming Policy were implemented in 2008. As the former was implemented at the end of 2008 it is unlikely that it was sufficient to promote significant biodiesel industry growth in that year. Thus, it is likely that the significant growth in the biodiesel industry related to policy implementation at the beginning of 2008, as palm oil companies would need time to establish biodiesel factories as subsidiary companies. This points to the Palm Oil Down-Streaming Policy as the most significant policy as it was implemented at the beginning of the year.

The export tax structure imposed in the MoF regulation (see **Table 7.3**) also created an opportunity for the palm oil industry to profit from the overseas market for biofuel - as biodiesel products had a lower rate of export tax compared to other palm oil derivatives. As such, overseas biodiesel demand meant the product could be exported without the imposition of a high export tax. Thus, palm oil companies gained significant benefits from entering the domestic biodiesel sector as they could avoid high export taxes while profiting from an overseas market. In this context, it is suggested that the agro-fuel alliance was formed due to the palm oil industry's response to the Palm Oil Down-Streaming Policy rather than the Mandatory Blending Policy. To be more precise, the bonding of the palm oil industry with the biodiesel industry was not correlated with the biofuel policy but with wider economic policy.

The government's decision to impose export tax on CPO created an irony for Indonesia's biofuel policy. On one hand, the policy had encouraged the palm oil industry to bond with the biodiesel industry, which effectively forged an agro-fuel alliance for the biodiesel sector and supported the growth of the industry. On the other hand, Indonesia was still unable to meet its biodiesel targets despite the bonding with the palm oil industry. This is because, whilst there was an increase in domestic biodiesel production, most of the product was exported to benefit the palm oil companies.

The situation in the biodiesel industry effectively saw the large agro-industry bond with the biofuel industry, constituting what agrarian political economists have referred to as an agro-fuel alliance (e.g. Fernandes et al., 2010; Boras Jr et al., 2011; Wilkinson and Herrera, 2011; Hollander, 2011; Gillon, 2016). Research, conducted in Brazil and the USA, has shown that such alliances are essentially formed as a response to government initiatives to use biofuel in the domestic fuel market, which creates a new market quickly capitalized on by large agro industries. The large agro-industry already has the advantage of producing crops efficiently and cheaply which is essential for producing biofuel (Wilkinson and Herrera, 2011; Hollander, 2011; Gillon, 2016). That being said, the large agro-industry is attempting to profit from the government's biofuel policy either through the mandatory use of biofuel or the provision of a subsidy for biofuel products.

However, Indonesia's biodiesel case study shows that large agro-industry, notably the palm oil industry, was initially not interested in entering the biodiesel sector, since the industry did not consider this business as a profitable endeavour, as discussed in Chapter 5. I assert that involvement occurred due to two main factors; first the more lucrative overseas market for CPO products, partly shaped by domestic policy. Second, the government's interest in encouraging development of the industry's derivative products as part of domestic economic development policy. This created an opportunity for the biodiesel industry to lobby the government to include biodiesel as part of the wider scheme in the Palm Oil Down-Streaming Policy. Thus, palm oil industry involvement with the biofuel business is not driven by the opportunity to profit from the biofuel policy - as in other case examples, but to counter the government policy whilst still making a profit. In this context, the palm oil industry avoids the higher tax rate for exporting CPO, while profiting from the overseas biodiesel market. This suggests that government economic policy, concerning the potential of a crop to produce biofuel, could be the most influential aspect in the forming of agro-fuel alliances, rather than the biofuel policy itself. Thus, this section has discuss on the underlying political economy that caused the bonding between biodiesel industry with palm oil agro-companies. The next section discuss on the way the intersecting policy made palm oil industry became the winner in Indonesia's biofuel policy. Thus, this section has discussed the underlying political economy that caused the bonding between the biodiesel industry and palm oil agro-companies. The next section discusses the way intersecting policies made the palm oil industry the winner in Indonesia's biofuel development.

7.2. Dominance of the Palm Oil Industry in the Biodiesel Sector

On one hand, the implementation of the Palm Oil Down-Streaming Policy ensured CPO availability for the domestic biodiesel industry. On the other hand, the government implemented the Mandatory Blending Policy and introduced subsidy incentives for the biodiesel industry to sell its product to Pertamina. The implementation of both policies is supposed to make the government able to achieve its biofuel target policy, especially for biodiesel. However, the underlying politics of Indonesia's biofuel policy (discussed in Chapter 6) revealed the inconsistency of the incentive policy for biofuel companies, which negatively impacted both the biodiesel and bioethanol industries, albeit to differing degrees. As discussed, this impact was more devastating for bioethanol as the production of fuel grade bioethanol was discontinued, whilst the biodiesel industry still had the option of selling its product to a lucrative overseas market (as discussed in Chapter 5).

However, this does not necessarily mean that the biodiesel industry was not affected by the adverse impact of the government's inconsistent biofuel policy. The Head of APROBI made the following media statement:

> *"Biodiesel producers are currently losing money because the price of crude palm oil has skyrocketed to US$1,100 per ton, whilst the biodiesel reference price is only around US$1,070 per ton."*
>
> *(The Head of APROBI interviewed by Tempo.co, 28 November 2010)*

The excerpt above shows the resentment of the Head of APROBI toward MEMR Decree Number 219 (2010) since the regulation which stipulated a subsidy incentive for biofuel producers, had in reality not benefitted biofuel producers since it did not cover biodiesel production costs (see also Chapter 6). However, as explained in Chapter 5, biodiesel is a derivative product of palm oil that can be produced at any stage of CPO manufacture. Derivatives also include stearin and palm fatty acid distillate (PFAD) which is a by-product of producing cooking oil and much cheaper than CPO. As such, the Palm Oil Down-Streaming Policy created an opportunity for both the palm oil and biodiesel industries. The palm oil industry wanted to avoid the high export tariff, whilst the biodiesel industry needed the cheap feedstock that the palm oil industry produced.

Based on personal observation from visiting Dumai City during field research in 2017, many biodiesel industries are located within the palm oil industrial complex.

This suggests that the biodiesel industry had linked with the palm oil industry and was acting as its subsidiary. As a palm oil subsidiary company, a biodiesel company could access the less valuable by-products of the palm oil industry as feedstock to produce biodiesel (see also **Figure 5.4** in Chapter 5). This meant the respective biodiesel company was able to minimize its production costs to allow greater profit not only from the overseas market but also the domestic market. The ability to reduce production costs significantly also meant the company was able to use the government subsidy to cover - and even to profit from – the production of biodiesel. This is noted by respondent R22:

> *“The conversion cost plus CPO price had actually been more expensive than the price of (fossil) diesel. For companies that didn’t have (access to) a refinery, this situation would be their end. But, for those who have (access to) refineries, the government subsidy is still enough.”*
>
> *(R22, Palm oil companies’ representative, May 2017)*

The respondent’s statement suggests that the government subsidy that was insufficient to cover the production cost of biodiesel was only a problem for independent biodiesel companies. This would not be the case for a biodiesel company under a palm oil group, since the subsidy may not be enough to create profit, but it is sufficient to cover the base cost of producing biodiesel. This suggests that being part of a palm oil agro conglomeration was highly advantageous or even necessary for a biodiesel company’s success. In addition to this, the route to market for biodiesel companies was also affected by policy, leading to a focus on international export. This was due to the unfavourable policy should it choose to sell its product in the domestic market.

The benefits of a biodiesel company being under a palm oil group are not restricted to minimizing production costs – another benefit is resilience to bankruptcy. This evidence emerged when I linked the information obtained during field research with information received from respondent R22 who was a former biodiesel company owner. The information from the field research came from the visit to Wilmar Bioenergy Indonesia Ltd. - a biodiesel company owned by the Wilmar Group, the biggest palm oil company in Indonesia. A local informant contacted an employee of the respective company who stated that the company had not produced biodiesel for about a year since there was no demand from Pertamina. This implies that this biodiesel company is supported by its parent company to ensure its business survival (as it did not produce biodiesel for almost a year). Further information came from R22 who had to shut down his company due to the inability to produce biodiesel for one year (as discussed in Chapter 5). The two pieces of information above suggest that palm oil industry involvement with the biodiesel industry is crucial and strategic, as the biodiesel company could still exist and operate even without producing biodiesel for a long period of time.

In contrast, an independent biodiesel company would have to use more expensive CPO to produce biodiesel, as it is the only type of accessible material. As such, this type of company cannot produce biodiesel with a low production cost - unlike a company which is a subsidiary of the palm oil industry. Consequently, it is suggested that an independent biodiesel company is unable to profit from the low government subsidy, although it is still able to sell its product on the overseas market. The differential advantages of these two types of manufacturer did not pose real problems particularly for the independent biodiesel company, as long as there was an available overseas market for biodiesel. However, the situation changed drastically in 2012 as the EU - a major biodiesel export destination - accused Indonesia's biodiesel product of entering the EU as a subsidized good. Respondent R1 stated:

> *"Indonesia's biodiesel product was being accused of being a subsidized good in the EU which deterred our export to EU countries. But, the most devastating effect happened when EU countries also implemented an anti-dumping policy which made our biodiesel product uncompetitive due to the high anti-dumping duties charged on our product and this has effectively stopped all of our biodiesel export activity."*
>
> *(R1, Biofuel companies' representative, May 2017)*

R1's statement suggests that the biodiesel company was facing difficulties in selling its product in the EU, as EU countries changed their policy towards Indonesia's biodiesel and this involved the introduction of an anti-dumping tax. Dumping is the practice of exporting a product at a price lower than the price of the same product in the home market. This practice, although not regarded as illegal conduct, creates severe consequences for the local product in the respective export destination. Thus, the government of the export destination country can impose an anti-dumping tax with the intention of protecting its local industry from cheap imported goods. The EU's decision to impose this tax on Indonesia's biodiesel meant that the EU market became unprofitable since the respective tax made biodiesel imported from Indonesia uncompetitive against the local product. This had a considerable impact as the EU was Indonesia's main export destination for biodiesel products (Ministry of Agriculture, 2014).

The situation created a dilemma, particularly for independent biodiesel companies, since they had lost their prime lucrative overseas market and selling biodiesel in the domestic market had negative consequences, as the subsidy did not cover their production costs. As a consequence, independent biodiesel companies eventually shut down their operations as respondent R22 stated:

> *"With the low amount of conversion cost (for biodiesel price index), many independent biodiesel companies are just shutting down their operations."*
>
> *(R22, Palm oil companies' representative, May 2017)*

The loss of a prime overseas market meant biodiesel companies, especially the independent ones, were negatively affected by the implementation of MEMR Decree Number 219 (2010) as they were not supported by the successful palm oil industry. However, biodiesel companies that had become part of the palm oil agro conglomeration were not so adversely affected by this regulation (as explained above).

The Palm Oil Down-Streaming Policy had caused the palm oil industry to become involved in the biodiesel sector but still did not benefit the government's biofuel policy implementation in achieving the target for domestic biofuel use since the majority of biodiesel produced is exported (see **Figure 5.2** in Chapter 5). Moreover, the loss of the overseas biodiesel prime market effectively undermined independent biodiesel companies, which could not survive selling only within the domestic market. Thus, the combination of the insufficient political commitment by the government in implementing biofuel policy along with the unfavourable overseas market conditions served to strengthen the palm oil industry's supremacy over the biodiesel industry.

The dominance of the palm oil industry was furthered by events that occurred in 2014 and 2015 that created an opportunity for the large palm oil industry to influence the government and eventually shift the trajectory of the biofuel policy. The 2014 event (the CPO price plummets) had tremendous consequences for the domestic palm oil industry, which will be discussed in depth in section 7.3. Meanwhile, the 2015 event (ending the subsidy policy) demonstrated the lack of governmental commitment to delivering its biofuel policy. This is noted by one respondent as follows:

> *"The Parliament has decided that the government must not distribute subsidy to private companies. The Parliament argues that the government subsidy is supposed to be distributed for the benefit of the people not for the benefit of private companies. So, we (the government) have to cancel the plan to subsidize biofuel in next year's budget."*
>
> *(R24, Government official representative, September 2016)*

The statement by R24 highlights the reason that the government stopped the subsidy for the biofuel programme. During the budget hearing meeting with the Parliament there was disagreement regarding the subsidy beneficiaries. The Parliament argued that "government subsidies must only be given to benefit the people not private companies" and as such the government rescinded the biofuel subsidy policy. However, it is possible to contest this argument because other government subsidies, such as the (fossil) fuel subsidy, are given to companies. Moreover, people benefit from the subsidy in the form of receiving goods and services at an affordable price, when the subsidy is given to the company that provides the respective goods/services. The only difference between biofuel subsidies and other government subsidies is the recipient - the former is the private sector while the latter is a state-owned enterprise.

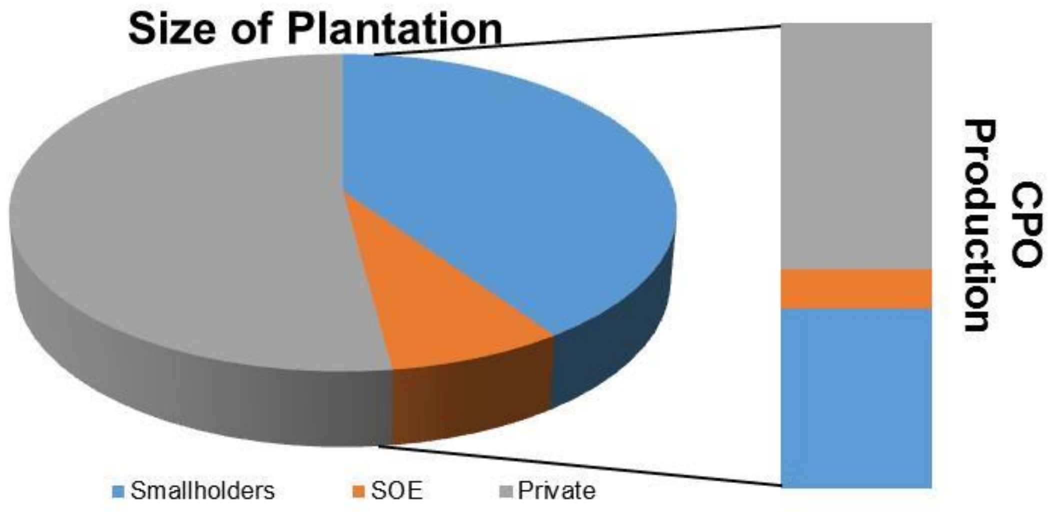
Although the Parliament does not have the authority to execute a policy, it has the power to force the government to accommodate Parliament's decision. This led to complicated politics within the Indonesian Parliament regarding its position towards the biofuel policy, which may have had its root in the incumbency of the fossil fuel business - as happened with the government officials who formulated the biofuel subsidy policy discussed in Chapter 6. Nevertheless, it would require a thorough investigation to uncover the politics involved, particularly to understand Parliament's motive for the decision, but this is beyond the scope of this thesis.

The government's decision to rescind the biofuel subsidy policy further strengthened the dominance of the palm oil industry over the biodiesel industry. This is because without the subsidy, selling biodiesel in the domestic market was no longer profitable even for the biodiesel industry that was bonded with the palm oil industry. Thus, with both overseas and domestic markets becoming unprofitable, it is expected that the biodiesel industry will collapse as it does not have a means for creating profit. However, as previously discussed, a biodiesel company that has become a palm oil subsidiary could still exist despite not producing anything. This meant the only biofuel industry existing in Indonesia is the biodiesel industry within the palm oil agro conglomeration. This has created an opportunity for the palm oil industry to influence the government with regard to its biofuel policy as will be discussed in the next section.

7.3. The Influence of the Palm Oil Industry in the Government's Biofuel Policy

Chapter 4 has discussed the effect of past agrarian policy on the palm oil industry, which successfully incorporated smallholders and farmers into the industry and effectively made them an extension of the palm oil companies. Moreover, the agrarian policy implemented in this sector in the 1970s to 1980s has positioned smallholders as the second biggest actor in the palm oil industry - as of 2010 their total contribution was approximately one third of the total palm plantation area and production (**Figure 7.2**).

Figure 7.2
Indonesia's Palm Oil Industry Contribution in 2010



Source: Based on the data from the Ministry of Agriculture (2014)

However, smallholders' considerable involvement with the palm oil industry had both positive and negative consequences. For example, when the price of CPO is high and increasing, it increases the welfare of these smallholders, but if the price of CPO falls it poses the risk of plunging them into poverty. This was mentioned by several respondents:

> *"The low price of CPO would reduce the price of fresh palm bunches (FFB) and this would hit the farmers most since they could only produce FFB."*
>
> *(R1, Biofuel companies' representative, May 2017)*

> *"The government is concerned to maintain the price of CPO if it is too low since it will impact the smallholders whose numbers are significant in this*

industry. If the CPO price is too low, the price of FFB will be lower and if that happens smallholders won't be able to tend their crops which results in lower yields and eventually make them switch to other crops."

(R22, Palm oil companies' representative, May 2017)

The excerpts above suggest that lower CPO prices lead to a vicious circle for farmers. Low CPO prices result in lower income for farmers and as such it reduces their ability to keep the crop maintenance cost, which in turn will reduce their yield followed by a further decrease in their revenue. As noted by respondent 22, such a situation would potentially cause smallholders to switch to other revenue crops. However, the analysis in Chapter 4 has shown that a material characteristic of palm oil crops is that they need at least three years until the first harvest. This suggests that if smallholders decide to switch from palm oil to other crops, they would probably be unable to revert their farm plot back to palm oil without support from other actors such as private companies.

Another consequence emerges if farmers switch from planting palm oil to other crops. Since farmers produce approximately one third of the total CPO produced in Indonesia (Ministry of Agriculture, 2014), smallholders switching their palm plantations to other crops would result in a significant reduction in CPO production at the national level. Thus, the problem of a low price for CPO is not only a problem for large palm oil companies, but also a concern for the government since smallholders will be impacted the most.

This was an issue when a decreasing trend in the international price for CPO meant that it finally reached USD693/MT by the end of 2014 and was continuously decreasing (Index Mundi, 2019). This price was close to the cost of producing CPO as respondent R22 stated:

> *"In my calculation, the minimum price for CPO should be kept at USD600/MT. If it's lower, it will hit smallholders the most."*
>
> *(R22, Palm oil company representative, May 2017)*

The respondent's statement recommends USD600/MT as the minimum price for CPO as both smallholders and large palm oil companies would be affected (with the former suffering the greater impact) if the price tips below this. However, the CPO price kept decreasing in the first half of 2015 until it reached USD549/MT in August 2015. The sharp decrease in the CPO price in the international market was primarily due to oversupply as the Head of GAPKI (*Gabungan Pengusaha Kelapa Sawit Indonesia*/Indonesia Palm Oil Company Association) stated in the media:

> *"The CPO price has decreased due to several factors such as a reduction in demand from the main importer destinations such as the EU and the Middle East, a decrease in the crude oil price, an increase in the production of CPO substitute commodities like soy bean and rapeseed, and a mandatory blending programme that is still ineffective. We were hoping that the biodiesel programme would increase the price of CPO, but the programme is still far from reaching its target."*
>
> *(Joko Supriyono, Statement during International Palm Oil Conference, 26 November 2015)*

The statement by the Head of GAPKI indicates that the lessening demand for CPO caused the price to decrease and thus, to reverse the condition, he suggests that increasing demand for CPO is the answer. He further emphasises that the biodiesel programme is a way to increase the price of CPO in the international market. Thus, the palm oil industry sought an opportunity to increase the CPO price by relying on the biodiesel industry to increase its production using CPO as feedstock (which would increase CPO demand). Next, I will discuss how the palm oil industry used its bargaining position to influence government policy and benefit the industry.

7.3.1. Establishment of the CPO Supporting Fund: An Incentive for the Government?

The fall in the CPO price in 2014 happened at around the same time that the government decided not to allocate a subsidy to the biofuel industry in 2015. Thus, some large palm oil companies recommended that the government establish a trust fund for the palm oil industry. Respondent R1 stated:

> *"BPDPKS[15] appeared officially as the initiative of the government c.q[16]. the Ministry of Finance, but its formation came from a recommendation by the large palm oil companies due to low CPO prices caused by the reduction in world demand for CPO. It was hoped that a burgeoning biofuel industry, would increase demand for CPO and subsequently increase the price of palm oil."*
>
> *"After repeated discussions, the palm oil bosses agreed to form the BPDP(KS), and they're trying to find its hook within the regulations and they found it in the Law on Plantations. Everything fits there except for the energy issue"*
>
> *(R1, Biofuel company representative, May 2017)*

The first excerpt indicates that the large palm oil companies recommended that the government create *dana perkebunan kelapa sawit* (DPKS) or a CPO supporting

[15] BPDPKS is acronym of *Badan Pengelola Dana Perkebunan Kelapa Sawit* or CPO Supporting Fund Agency.
[16] c.q. is abbreviation of latin word 'casu quo' which means "in which case, if that be the case, in particular" (en.wiktionary.org, 2019)..

fund. The government also established *Badan Pengelola Dana Perkebunan Kelapa Sawit* (BPDPKS) or the CPO Supporting Fund Agency to manage the fund. The respondent further stated that the idea of creating such a fund came from the Law on Plantations, which meant that the palm oil industry legitimately utilized another regulation to facilitate the government in implementing the industry's recommendation. To be precise, the palm oil industry through its elites recommended that the government execute the mandate from the Law on Plantations to create the CPO supporting fund as a means to increase the price of CPO in the international market by using the fund to finance the government's biofuel policy. In this context, the establishment of the CPO supporting fund would seem to be a means of executing government policy instead of a recommendation from the palm oil industry.

The Law on Plantations mentioned by respondent R1 is the original regulation. Part of this law regulates the financing of plantations as stated below:

> *"(1) Financing of state-owned plantations comes from the central government budget.*
>
> *(2) Financing of regional government owned plantations comes from the regional government budget.*
>
> *(3) Financing of privately-owned plantations comes from a fund that collects from plantation business actors, financing institutions, communities and others.*
>
> *(4) Collection of funds from plantation business actors as referred to in paragraph (3) is used for human resource development, research and*

development, plantation promotion, rejuvenation of plantation crops, facilities and infrastructure.

(5) Further provisions regarding the collection of funds from plantation business actors, financing institutions and communities as referred to in paragraph (4) is regulated in a Government Regulation."

(Law Number 39, 2014, Article 93)

The foundation used as the legal basis for establishing the CPO supporting fund is based on Article 93 of the Law on Plantations. Article 93 regulates the financing method for plantations where clause three states that private plantations should be privately financed either independently or through financing institutions such as banks or other legitimate funding sources. However, the Law on Plantations does not mention the type of crops to be financed using plantation funds. This inadequacy in the Law on Plantations (i.e. failing to mention the crops eligible under the trust fund) is quickly rectified through the enactment of Government Regulation Number 24 (2015) on Collection of Plantation Funds which states:

"(1) Fund collection is purported to develop sustainable plantations.

(2) Fund collection is conducted for strategic plantation commodities.

(3) These strategic plantation commodities are palm oil, coconut, rubber, coffee, cacao, sugarcane and tobacco."

(Government Regulation Number 2, 2015, Article 3)

The excerpt above shows that the government has created a regulation to define the type of crops that can use the plantation fund mechanism, which in this case are crops that are considered as strategic to the national interest. Thus, the government has created a fundamental reason to create the CPO supporting fund based on the regulation above.

Moreover, the Law on Plantations also mentions that the use of the plantation financing fund is specifically designated for plantation activities that exclude the subsidizing of biofuels. This would explain the second comment from respondent R1 above when he mentions that the legal base for establishing the CPO supporting fund is available in the Law on Plantations although the energy related issue is not covered. Thus, the government used Government Regulation Number 24 (2015) to cover this deficit as the regulation stated:

> *"Funds collected are used for the purposes of:*
>
> *a. human resource development for plantations;*
>
> *b. research and development of plantations;*
>
> *c. promotion of plantations;*
>
> *d. rejuvenation of plantations; and*
>
> *e. facilities and infrastructure of plantations."*
>
> *(Government Regulation Number 24, 2015, Article 9, Clause 1)*

> *"Use of funds collected is included in fulfilling food needs, industrial down-streaming and utilization of biodiesel."*
>
> *(Government Regulation Number 24, 2015, Article 9, Clause 2)*

The above excerpts indicate that the government created a legal justification for specifically using the plantation fund to finance the biodiesel industry. The excerpts from Government Regulation Number 24 (2015) Article 3 and Article 9 highlight a serious government commitment to creating a legal base for the use of the plantation financing fund, collected from private companies, to finance its biodiesel programme.

Although the government mentioned several crops that are considered as nationally strategic, palm oil is the only crop that has the plantation fund established. This suggests that the government is targeting the palm oil plantation fund to support its biodiesel programme. This is evident with the issue of Presidential Regulation Number 61 (2015) on the Collection and Use of the CPO Supporting Fund as this is a derivative regulation from Government Regulation Number 24 (2015).

Interestingly, Government Regulation Number 24 (2015) and Presidential Regulation Number 61 (2015) were signed by the President and came into effect on 18th May 2015. This was highly unusual since there is normally a brief period of time between an issue of a regulation and the issuance of its derivatives. This 'brief period of time' could be translated as that required to go through the government's bureaucratic processes, which could take several months. This arduous process had previously caused problems for biofuel policy incentives, such as the VAT rebate, that rendered it useless for the biofuel industry (as discussed in Chapter 6). Moreover, there are many clauses within both policy documents that indicate copy and paste statements, or where the only change is the word 'plantation' to 'palm oil plantation'. I have highlighted some of the most relevant clauses for the analysis in this chapter in **Table 7.4**. It seems that both policy documents were drafted at the same time which suggests that the government was focusing its attention on palm oil and not any other crops.

Table 7.4
Comparison of Two Policy Documents that Regulate the Plantation Fund Establishment

Government Regulation Number 24 (2015)	Presidential Regulation Number 61 (2015)
"The Plantation Fund is intended to encourage the development of the sustainable plantation." (Article 3, Clause 1)	*"The CPO supporting fund (CSF) is intended to encourage the development of the sustainable palm oil plantation."* (Article 2, Clause 1)
"The Fund is collected from plantation companies, financing agencies, public fund, and others." (Article 4)	*"The fund is collected from palm oil companies, financing agencies, public funds, and others."* (Article 2, Clause 2)
"Funds collected from plantation companies come from export levies, for plantation commodities, and subscription fees." (Article 5, Clause 1)	*"Funds collected from palm oil companies come from export levies, for the CPO product and its derivatives, and subscription fees."* (Article 3, Clause 1)
"Funds collected are used for the purposes of: a. human resource development for plantations; b. research and development of plantations; c. promotion of plantations; d. rejuvenation of plantations; and e. facilities and infrastructure of plantations." (Article 9, Clause 1)	*"Funds collected are used for the purposes of: a. human resource development for palm oil plantations; b. research and development of palm oil plantations; c. promotion of palm oil plantations; d. rejuvenation of palm oil plantations; and e. facilities and infrastructure of palm oil plantations."* (Article 11, Clause 1)
"Use of funds collected include fulfilling food needs, industrial down streaming and utilization of biofuel." (Article 9, Clause 2b)	*"Use of funds collected include fulfilling food needs, palm oil industrial down streaming, and utilization of biodiesel."* (Article 11, Clause 2)

Sources: Author created

The fact that both policies were implemented at the same date and had similar wording indicates the strong political will of the top political elites, notably the President, to implement the palm oil plantation fund or *dana perkebunan kelapa sawit* also known as the CPO supporting fund. Moreover, the government through the Ministry of Finance issued MoF Regulation Number 113 (2015), which is a regulation to manage the collection of the CPO supporting fund by establishing BPDPKS or the CPO Supporting Fund Agency. This regulation was put into effect on 10th June 2015 less than a month after the implementation of the previous two regulations. Thus, there are three regulations that the government issued to create the legal base, as well as the mechanism for managing the fund, with all of them formulated and implemented within a period of less than one month.

The speed in developing the whole legal basis from Government Regulation Number 24 (2015) to MoF Regulation Number 113 (2015) shows the effectiveness of the influence of the top political elite when implementing a policy. This also suggests that the top political elites are the most important figures to intervene in policy implementation in Indonesia. The involvement of these political figures in the creation of the CPO supporting fund eradicated the government red tape usually witnessed in policy creation. The regulations detailed above also suggest that the government took seriously the palm oil industry recommendation to establish a CPO supporting fund.

Government actions suggest that money was needed to finance the biofuel programme and these funds could not be allocated from the government budget due to political reasons (as discussed in Chapter 6 and in the earlier section of this chapter). Thus, it could be argued that the palm oil industry indicated a way for the government to fund its biofuel programme without resorting to government funds and which could also be implemented legally. This also suggests that the CPO supporting fund became the incentive for the government to speed up the process of creating the relevant regulations. Thus, instead of having large agro companies benefiting from biofuel policy implementation such as those in the US (Gillon, 2010) and Brazil (Hollander, 2011; White and Dasgupta, 2011), establishment of the CPO supporting fund has positioned the Indonesian government as the benefactor for its own biofuel policy. However, it does not mean that the palm oil industry suffers a loss, as the CPO supporting fund is the policy recommended by the industry to benefit them. To understand how the CPO supporting fund benefits the palm oil industry, I will discuss how the fund is collected and its impact on the palm oil industry in the next subsection.

7.3.2. The Price of the CPO Supporting Fund: Government Patronage for the Palm Oil Industry

The establishment of the CPO supporting fund has created a mutual relationship between the government and the large palm oil industry. Oliviera et al. (2017) assert that biofuel policy creates state-corporate alliances in cases where the government needs large corporations' support in solving energy security problems. This, in turn, creates new markets for the corporation to capitalize on and profit from. Their research compares the reality of biofuel policy implementation in Brazil, the USA and the EU where such patterns exist and exposes the negative consequences. For example, deforestation, workers and farmers exploitation, as well as closures of small-scale biofuel producers in favour of large corporate activity to produce biofuel at large scale. All of these negative consequences became the paradox of biofuel production as it was originally promoted as a green energy source and one that would be beneficial for farmers. Nonetheless, Indonesia's case study shows a different way in which biofuel policy implementation has been used by large agro industries in accordance with their benefits - this forms the focus of the following section.

The CPO Supporting Fund Agency (hereafter called BPDPKS) collects money for the CPO supporting fund by imposing a tax levy on top of the export tax charged to palm oil companies that conduct export activity (**Table 7.5**). Thus, palm oil companies need to pay a levy if they want to export their CPO and derivatives regardless of the current price of CPO in the international market. Although the levy and export tax are essentially government levies, they serve different purposes. The funds collected from the export tax will go into the government budget and can be spent in accordance with the government's budgetary plan. However, the funds collected from the levy can only be used for the purposes stipulated in Presidential Regulation Number 61 (2015, Article 11).

Table 7.5
Levy and Export Tax on Palm Products

	Products / Price	Levy (USD)	Export Tax (%)										
			>US$750/ton	>US$800/ton	>US$850/ton	>US$900/ton	>US$950/ton	>US$1,000/ton	>US$1,050/ton	>US$1,100/ton	>US$1,150/ton	>US$1,200/ton	>US$1,250/ton
1	Fruits, kernel and empty shell												
2	CPO and CPKO												
3	Cooking oil and stearin (prior to refinery)												
4	Oil and stearin from kernel (prior to refinery) and PFAD												
5	Other PFAD												
6	Cooking oil (after refinery)												
7	Process CPO dan stearin (after refinery)												
8	Cooking oil in branded pack ≤ 20kg												
9	**Biodiesel**												

Tax Rate > 0
Tax Rate = 0
Source: Based on MoF Regulation Number 140 (2016) and MoF Regulation 114 (2015)

The BPDPKS 2017 Annual Report (p.6) indicates that the funds collected from palm oil companies contributed more than 95% of the total funds collected in 2016 and 2017 where 21.1% and 79.0% respectively were spent from the collected fund for subsidizing biodiesel (**Table 7.6**). These amounts comprise more than 90% of the agency's total expenditure across both years. Thus, it can be said that the government collected money from palm oil companies to fund its biodiesel programme. Since, BPDPKS is a government body, which is not meant to profit from its activity, any surplus or deficit is to be reported to the government before BPDPKS can use the funds for the next year's activities. The government could now fund the biodiesel programme without the need to spend any public funds, since the money collected from the palm oil companies is more than enough to cover the cost of the biodiesel subsidy.

Table 7.6
BPDPKS Summary of Financial Statement of 2016 and 2017*
(Milion of Rupiah)

	2016**	2017***
Income		
- Income from palm oil companies levy	2,915,076	3,473,661
- Other income	122,099	117,179
Total	3,037,175	3,590,840
Expenditure		
- Incentive for biodiesel production	641,741	2,840,184
- Other expenditure	43,158	61,597
Total	684,899	2,901,782
Surplus	**2,352,276**	**689,058**

*) For the period end in 31 March

**) 9 months of operation

***) 1 year of operation

Source: Based on BPDPKS Annual Report of 2017

Although the new policy scheme seems to benefit biodiesel companies at the expense of the palm oil industry, it actually benefits biodiesel companies with ties to palm oil companies as two respondents stated:

> *"The establishment of BDPKS is only benefiting palm oil companies that are also engaged in biodiesel, as pure biodiesel companies have all been shut down."*
>
> *(R22, Palm oil company representative, May 2017)*

> *"The subsidy has been helpful (for the company), although it came from palm oil producers and exporters."*
>
> *(R21, Biodiesel company representative, May 2017)*

The analysis in the earlier section of this chapter showed that independent biodiesel companies had shut down their operations due to the combined effect of MEMR Decree Number 219 (2010) and the changing policy in the EU (Indonesia's prime biodiesel market). Thus, the only biodiesel companies that still operate are those that have become the palm oil subsidiary company. With the implementation of the CPO supporting fund, palm oil companies essentially pay the price difference between the cost of biodiesel production and the fossil fuel market to biodiesel producers, which are in effect subsidiary companies. To be more precise, the palm oil companies are subsidizing their own biodiesel companies and legitimizing their action by involving the government through the establishment of CPO supporting fund.

The creation of the CPO supporting fund meant that large palm oil companies gained a double benefit - economically and politically. From the economic perspective, subsidizing biodiesel companies increased palm oil demand from the respective industry, which also increased the price of CPO in the international market. Respondent R7 stated:

> *"What is most important for this policy is not the effect on biodiesel production, but what comes after with the price of CPO as the price rebounded."*
>
> *(R7, Government official representative, April 2017)*

According to R7's statement, the new policy successfully increased demand for palm oil and subsequently increased the price of CPO. Moreover, **Figure 7.3 (red arrow)** also shows that the price of CPO in the international market was rebounding - with the CPO price showing an increasing trend following its lowest price in November 2015. The increase in the CPO price at the beginning of 2016 suggested that the palm oil industry's decision to pay the government levy to subsidize the biodiesel industry had been an economically strategic action. Biodiesel industry demand for CPO increased and this subsequently increased the price of CPO. This would eventually lead to an increase in the revenues of palm oil companies. Thus, by subsidizing its own subsidiary companies, the palm oil industry managed to benefit from the increased price of CPO on the international market.

Figure 7.3
Price of CPO (2011-2016)

Source: Created based on Index Mundi, 2018

From the political perspective, the establishment of BPDPKS increased the palm oil industry's prestige within the government. As such, the government became the patron of the palm oil industry, particularly as regards its lobbying of countries that established trade barriers that impacted Indonesia's palm oil or biodiesel trade. Respondent R1 stated this succinctly:

> *"APROBI along with the government c.q the Ministry of Agriculture, the Ministry of Trade and the Directorate General of EBTKE of the Ministry of Energy and Mineral Resources are trying to lobby EU countries to ensure that no subsidies are introduced for Indonesia's biodiesel products that enter their markets."*

(R1, Representative of biodiesel company, May 2017)

Furthermore, as smallholders are the second biggest contributor to the palm oil industry, it is necessary to prevent the CPO price from continuously decreasing to protect them. Thus, government support for the palm oil industry was driven by the pretext of protecting smallholders and their interests. As the Coordinating Minister of Maritime Affairs stated in the media:

> *"I am strongly defending this palm oil (industry) because it concerns the fate of the small people. The President also speaks out strongly on this matter."*
>
> *(Luhut Binsar Panjaitan, Speech in front of the media, 27 March 2019)*

The excerpt above is part of the speech by the Coordinating Minister of Maritime Affairs in response to the European Commission verdict to forbid the use of palm oil-based biodiesel because it causes deforestation (www.wartakota.tribunnews.com, 29 March 2019). This recent event gives a strong indication of the Indonesian government's support for the palm oil industry, particularly when policies in other countries negatively impact the industry.

Government patronage towards the palm oil industry can be justified as a means of defending the interests of smallholders and workers in plantation companies, because the impact of a low CPO price would hit smallholders the most. Also, large palm oil plantations employ hundreds of thousands of workers and the industry's demise would mean increased national unemployment. Thus, government intervention in lobbying countries that establish trade barriers impacting either palm oil or palm oil-based biodiesel is important as means to secure the future of Indonesia's palm oil industry. However, it is large palm oil companies that reap the benefit of government actions lobbying foreign markets to relax their policies towards palm oil and palm oil-based biodiesel products from Indonesia, as they are the ones who gain the most from the increasing price of CPO.

The establishment of the CPO supporting fund has indicated how the palm oil industry overcame the government’s insufficient political commitment towards the biofuel policy. On the one hand, palm oil companies were concerned by the sharp decrease in the price of CPO which reduced their profits. On the other hand, the heavily politicised biofuel sector rendered the government unable to implement its biofuel policy efficiently. This enabled the palm oil industry to propose that the government create the CPO supporting fund and use it to fund the biodiesel programme. The government viewed the CPO supporting fund as the answer to its burdensome biofuel problems as the palm oil companies would finance the fund. This meant the palm oil industry supported the government’s biodiesel programme financially without recourse to the government’s budget. For the palm oil industry, the act of financing the government’s biodiesel programme meant sacrificing a small amount of profit but increased the price of CPO, which increased their own profits with the additional bonus of government patronage for the industry.

Furthermore, the government now relies on the palm oil industry to support its biofuel policy - this is not only limited to the bonding of the palm oil and biodiesel industries, but also relates to the financing of the policy through the establishment of the CPO supporting fund. As such, the palm oil industry has become profoundly involved with the government’s biofuel policy, with the industry aiding the government to establish the CPO supporting fund to create a sustainable palm oil plantation as its justification. Castan-Broto (2018) highlights the use of government funds for low carbon delivery projects that provide sustainable benefits such as providing energy access to marginal communities and carbon emission reduction. Legally, the CPO supporting fund is a government fund purported to create sustainable palm oil production which potentially reduces carbon emissions and is beneficial for small rural farmers. However, the fund is hardly considered as a green financial fund since the majority is used to fuel biodiesel companies within the palm oil industry. Indeed, the palm oil industry is a key stakeholder with an interest in the fund as it both contributes to and benefits from the fund.

With the establishment of the CPO supporting fund, Indonesia's biofuel policy has, in reality, twisted into a palm oil biodiesel policy, since it is only biodiesel companies that have ties with the palm oil industry that are still in operation. This situation arose due to a multi-faceted policy traceable back to Indonesia's past agrarian policy in the 1970s. Oliviera et al. (2017) argue that agro-fuel alliances occur as a result of complex political economics in countries that implement biofuel policies. This is reflected in the Indonesian biofuel policy as its implementation was influenced by crop-related politics even before the government decided on the policy. This factor along with insufficient political commitment in policy implementation has led the palm oil industry to become the champion of Indonesia's biofuel policy.

7.4. Summary and Conclusion

Several case studies have shown that agro-fuel alliances can form due to the responses of industrial actors towards the government's intention to resolve energy security issues through the implementation of biofuel policies (Gillon 2010; Wilkinson and Herrera, 2011; Oliviera et al., 2017). These analyses have shown that industrial actors profit from governments' biofuel policies, such as mandatory blending targets and subsidies. Indonesia's biofuel politics (as presented in this chapter) have given a new insight into the emergence of agro-fuel alliances – showing that they can also arise from the implementation of government policies in the agro-industry sector to promote the development of a derivative industry related to a certain crop.

The analysis presented in this chapter has shown the way the government's interest in developing the palm oil derivatives industry has intersected with biofuel policy, resulting in an opportunity for the palm oil industry to profit from biofuel policy implementation. To be more precise, government interests in developing a palm oil-based industry has allowed the industry to capitalize on government policy through integrating the biodiesel industry into its business conglomeration. Nevertheless, the agro-fuel alliances consolidated through the Palm Oil Down-Streaming Policy have also created a vicious circle for the government. On one hand, the government needed to finance its biofuel programme, but did not want to use public funds. On the other hand, palm oil companies have an interest in increasing the CPO price and recognised that an increase in demand for palm oil-based biodiesel would mean an increase in demand for CPO, followed by an increase in the price of CPO. Subsidizing the government biofuel policy through the CPO supporting fund would also create government dependence on the palm oil industry to pay for its biofuel program. In exchange the palm oil industry could claim government patronage over the industry essentially creating 'state – corporate alliances' (Oliviera et al., 2017, p.9)

The analysis in this chapter has also shown the importance of understanding the political economy of biofuels as this fundamentally influenced the government when implementing its policy. Agro-fuel alliances do not merely emerge due to the flexible usage of crops produced by large agro-industry as argued by agrarian political economists (e.g. Gillon, 2010, 2016; Wilkinson and Herrera, 2011; White and

Dasgupta, 2011), but are part of a multi-faceted political processes as suggested by Oliviera et al. (2017). The bonding of the biodiesel industry with the palm oil industry occurred not as a means of business consolidation to profit from biofuel policy, but as a counter response to government policies on both biofuel and palm oil.

The lack of concerted political commitment to biofuel policy - owing in part to incumbency associated with fossil fuels - ultimately gave large industrial actors the ability to reshape government policy in accordance with their own interests. In particular, it created an opportunity for the palm oil industry to influence government biofuel policy and achieve its own ends, that is to increase the price of CPO. Thus, it is suggested that strong and consistent political commitment, particularly from the top political elites, is required to effectively implement biofuel policy designed to address core policy problems of environmental degradation, rural poverty, and energy security. In this case, ultimately the policy has over taken by economic interests and the motives of market actors focused on profiting from biofuel with little care about achieving policy objectives.

The Indonesian case study on biofuel has shown that an agro-fuel alliance does not necessarily occur due to the opportunity for profit that large agro-industry seeks when the government implements a biofuel policy. Instead, the underlying political economy of biofuel was the main driver for biofuel companies bonding with large agro industries. The politics of biofuel have not only promoted unsatisfactory policy implementation, but also created an opportunity for the large palm oil industry to intervene and influence contemporary biofuel policy. Furthermore, government politics around biofuels have allowed large agro industries to influence government policy and even receive government support. Oliviera et al. (2017) argue the importance of critically examining the underlying political economy of biofuel to understand which aspects can be transformed to increase the sustainability of biofuel production. In the case of Indonesia, I have further argued that commitment from political elites was essential for the effective implementation of a strong biofuel policy - because without strong political will the policy is likely to only serve the agenda of large agro companies.

Chapter Eight

Conclusion

Prior to this thesis, there has been some limited research on biofuel policies in Indonesia (e.g. Amir et al., 2008; Afiif, 2014; Fatimah, 2015). However, these studies address only two aspects of Indonesia's biofuel policy: the government's initial intention for developing a biofuel industry; and the failure of the jatropha initiative in biofuel policy implementation. Although these previous studies discussed the cause of the failure of jatropha, they only examined how the jatropha crop emerged as the focus of biofuel policy and the inability of jatropha farmers to supply the biofuel industry, they did not extend their analyses to the historical and political-economic dynamics that underpin the trajectory of Indonesia's biofuel policy development.

Outside of the Indonesian context, most biofuel studies using the lens of political ecology are only focused on the socio-ecological impact of agro-fuel alliances within the biofuel energy system (e.g. Searchinger et al., 2008; Fargione et al., 2008; Fernandez et al., 2010; Ariza-Montobbio et al., 2010; Obidzinsky et al., 2012). Meanwhile, those studies using the lens of agrarian political economy have tended to look at the way the large agro-industries have benefitted from specific biofuel policies, which have ultimately become the foundation for agro-fuel alliances (e.g. Boras Jr et al., 2011; Wilkinson and Herrera, 2011; Gillon, 2010, 2016; Oliviera et al., 2017). Most of these studies, with the exception of Oliviera et al. (2017), do not delve further into discussion of the underlying political economy that shapes the ways governments formulate biofuel policy and *(un)intentionally* support the formation of agro-fuel alliances.

Oliviera et al. (2017) assert that the formation of agro-fuel alliances is synonymous with mutual relationships between governments, large agro-industries and biofuel companies. Similar to other studies, they highlight how governments intent on resolving domestic energy security issues implement policies that enable the industrial actors in agriculture and biofuel to benefit from newly created markets. Furthermore, they also examine why certain agro-industries come to dominate biofuel markets and eventually influence governmental biofuel policy - this is core to the research and analysis within this research. However, they do not focus on the history of policy and politics in shaping contemporary biofuel policy – as addressed in Chapter 2 - and thus, limit the emphasis placed on the role of biofuel companies compared to agro industries within attempts to understand the alliance. Thus, this research thesis has addressed the dynamic of political economy in Indonesia's biofuel policy. The underlying politics of biofuels are undoubtedly influenced by the past politics of crops which reshape contemporary biofuel policy. The situation is also exacerbated by insufficient political commitment that eventually paved the way for the large palm oil industry to have hegemony over biofuel policy.

The politics of biofuels in this research has increased our understanding of the underlying political economy of biofuels which needed to be expanded within political ecology and agrarian political economy literature. As most of political ecology literature focuses on the environmental and social impacts of biofuel production on a large scale, this research addresses the multifaceted nature of Indonesia's economic policy that caused the government to endorse biofuel production on a large scale and rely on the large agro-palm industry to support the biofuel industry. This could potentially create what Oliviera et al. (2017) describe as 'political ecological blind spots' since government reliance on large agro-industry to support its biofuel policy has been the cause of the negative environmental and social outcomes associated with the production of its feedstock. Through the lens of agrarian political economy, it is also revealed that the history of the agrarian policy for certain crops can shape and reshape the biofuel policy implemented decades later. Thus, this research had used a combination of both literatures to understand the politics of biofuel in Indonesia, its actors and the intersections between different interests that eventually twisted the policy.

This final chapter is divided into three sections. The first section discusses the key findings from each empirical chapter and how they synthesize and contribute to the existing body of knowledge. The second section reflects on the limitations of this research, as well as potential research areas that could be addressed in the future to complement this research. The third section, discusses the possible implications for policy and practice. Given this study is about Indonesia's biofuel policy and has been sponsored by the Indonesian government, I consider some more applied recommendations for the problems that have been identified in this research.

8.1. The Politicization of Biofuels: From Crop Politics to Agro-Fuel Alliances

This analysis began with a look at the beginnings of Indonesian government policy on biofuels. The research highlighted how initially biofuel policy was viewed as a means to solving problems of energy security and rural poverty by encouraging farmers and smallholders to plant sugarcane for developing bioethanol and jatropha for developing biodiesel (Amir et al., 2008; Afiff, 2014; Fatimah, 2015). Such early policy attempts were to culminate in failure and ultimately Indonesia's biofuel policy became one that largely facilitated the interests of large palm oil companies.

Although this research has focused on Indonesia as a case study, the emergence of alliances between large agro-industry and biofuel producers has been seen in many countries that implemented biofuel policies, including Brazil, the USA and the EU (Oliviera et al., 2017). Using the lens of political ecology and agrarian political economy together, this analysis of Indonesia's biofuel policy offers an alternative perspective on the emergence of agro-fuel alliances, which arises out of the intersection between the two bodies of knowledge (see **Picture 2.1** in Chapter 2). There are three key findings in this research that I assert enhance our current knowledge and understanding of the rise of agro-fuel alliances within the biofuel energy system: 1) the significance of past agrarian policy for shaping contemporary policy trajectories; 2) the role of markets; and 3) the importance of elite political commitment.

1) The role of past agrarian transformation in influencing contemporary biofuel policy.

Past agrarian policy has been largely under-examined within biofuel studies, particularly within the Indonesian context, where I argue it has been of utmost importance in shaping the trajectory of biofuel policy. The relevance of historical agrarian policy is primarily discussed in Chapter 4 where I analyse the two different crops that came to dominate biofuel feedstock in Indonesia i.e. sugarcane for bioethanol and palm oil for biodiesel.

Both sugar cane and palm oil had a similar historical policy background in the 1970s and 1980s, when the government focused its policy on both crops in an attempt to increase the welfare of farmers and rural workers. I argue that government aims to increase rural welfare were inspired by historical agrarian policy that dated back to the colonial era, particularly for the sugar industry. This is because the colonial government had successfully made the pre-independence Indonesian sugar industry the second largest producer in the world, while using small-scale farmers as the industrial backbone. At this time the profits from the sugar industry went to the colonial government, but farmers were able to generate large supplies inspiring the Indonesian government's agrarian policy transformation. The government's sugarcane policy in the 1970s and 1980s thus attempted to emulate colonial policy, but more effectively share the profit of the industry with farmers.

The government later expanded its pro-farmers policy to palm oil crops to enable small scale farmers to benefit where previously only industrial plantations had done so due to various physical and industrial characteristics. Nonetheless, these pro-farmers policies culminated in different outcomes for sugarcane and palm oil. Where the sugarcane agro-industry became fragmented and disintegrated, the palm oil industry became cohesive and larger with private companies and smallholders dominating the industry. I have asserted that the different outcomes for both crops set the stage for biofuel policy implementation in 2006, which saw sugarcane used to supply the bioethanol industry and jatropha (and later palm oil) used to supply the biodiesel industry.

The fragmented sugarcane industry proved unable to supply the bioethanol industry despite large potential within the domestic market. Conversely, palm oil became the biodiesel industry's preference for producing biodiesel, neglecting the government's preference for jatropha. I have shown how the different outcomes of the bioethanol and biodiesel industries were largely determined by their supplier. The palm oil agro-industry has an interconnected industrial chain that makes its output, crude palm oil (CPO) cheap and abundant, leading it to become the primary option for producing biodiesel. Meanwhile, within the domestic sugar industry there was not enough capacity to produce cheap and reliable feedstock for the bioethanol industry.

The analysis presented in Chapter Four has contributed to our understanding that the historical background of agrarian policy relating to different crops is an important aspect in the implementation of biofuel policies. Agrarian policy implementation in the past has not only shaped contemporary policy but has also determined industrial performance in respect to the different crops and ultimately influenced the biofuel industry's performance. Importantly, this also contributed to the way the biofuel industry bonded with its feedstock industry, with one fuel type and relevant feedstock (biodiesel - palm oil) coming to dominance over the other (bioethanol - sugar cane).

2) Understanding the dynamic of biofuel market structure.

Most biofuel studies argue that a biofuel policy creates new lucrative markets from which private institutions can capitalize (e.g. Holander, 2011; Gillon, 2010, 2016; Wilkinson and Herrera, 2011). However, the idea that biofuel policy creates a new market needs to be refined to include consideration of who would benefit from this market. In Indonesia, the biodiesel industry thrived with its market growing, while the bioethanol industry failed despite the government's attempts to develop both biodiesel and bioethanol industries. Indeed, Indonesia's biofuel policy implementation created a potentially large domestic market for both bioethanol and biodiesel. Nevertheless, only the biodiesel industry prevailed while the bioethanol industry flopped. This shows that there are other factors, beyond government policy, that shape the biofuel industry and influence its ability to consolidate its business.

The analysis of biofuel market structure for both bioethanol and biodiesel in Chapter 5 revealed that only large and cohesive agro-industries were able to benefit from the government's biofuel policy. Although this was the apparent result of past agrarian policy as discussed above, a careful examination of market structure shows another factor that reshaped the conditions of Indonesia's biofuel policy implementation i.e. the purpose for which biofuels were produced. Biodiesel is produced solely for fuel purposes, while bioethanol can be used flexibly for non-fuel purposes. Moreover, the bioethanol industry had already been developed for non-fuel purposes with a well-established market prior to biofuel policy implementation, despite the fact that the industry was struggling to secure feedstock.

In order to win themarket competition, biofuel needed to be competitive against its fossil fuel contender. The biodiesel industry could meet this requirement providing it used palm oil as its feedstock, while bioethanol could not. Bioethanol, however, already had a secure market for non-fuel purposes. This meant that fuel ethanol (FE) had to compete against industries needed bioethanol for non-fuel purpose and the fossil fuel industry. Thus, where biofuel policy implementation created a new lucrative market opportunity for biodiesel, it created only a new contender for the product within the bioethanol market.

The government's decision to regulate the domestic blended fuel market escalated the domestic biofuel situation. By appointing the state oil company Pertamina, as the sole blender for biofuel sold in the domestic market, the government limited domestic biofuel consumers. This was particularly important as biofuel needs to be blended with fossil fuel to be used in the engines of most vehicles. Pertamina's decision to buy biofuel was influenced by the biofuel price compared with that of fossil fuel. For the biodiesel industry, such a condition would be overcome as they could sell to both the domestic and overseas markets. However, the bioethanol industry encountered more problems than the biodiesel industry in producing fuel (i.e. arising from government tax policies), but did not need to compete with the fossil fuel industry since there were several other industries that needed bioethanol in their production lines. This made the production of bioethanol for fuel purposes become less attractive as a market for bioethanol producers.

Thus, by understanding biofuel market structure, it becomes apparent that the absence of other market contenders competing for the same product is an important factor in terms of the impact of biofuel policies. This is an important finding as although policy implementation may create a new market as highlighted in previous research (e.g. Eden, 2012; Van Dam et al., 2008; Gillon, 2010, 2016; Wilkinson and Herrera, 2011), this study has shown that attentiveness to the wider market context for specific biofuel products and their feedstocks is required.

In the context of Indonesia's biofuel policy, past agrarian policy has influenced both the establishment of large agro-palm industries and the fragmentation of the bioethanol market. Meanwhile, biofuel policy implementation made FAME (the palm oil-based biodiesel) an important new product in the fuel market with fossil fuel as the only contender, but there were not the same implications for bioethanol - attesting to the importance of considering the specificities of different types of biofuel. Thus, there are two key political-economic factors that can be identified as positively contributing to the palm oil industry forging agro-fuel alliances with biodiesel companies, whilst having the opposite consequences for bioethanol companies. My final contribution to the literature is, I argue, in many senses the strongest or most important factor in consolidating and shaping the agro-fuel alliance - this is the level of political commitment from key political elites.

3) The importance of insufficient political commitment in implementing biofuel policy.

Based on the above discussion, the biodiesel industry already had factors that would ensure its development by relying only on market mechanisms, as opposed to requiring government intervention. Meanwhile, the bioethanol industry did not have the same positive factors as its biodiesel counterpart. Swinnen (2010) argued for the government to intervene in the sector to alleviate disadvantages that prevented it from growing. However, instead of addressing the problem separately for different forms of biofuel, the government formulated a policy to incentivise all biofuel producers including both bioethanol and biodiesel and directed this policy at the domestic market. As this research has shown, the policy failed due to its inconsistency with other policies and because ultimately it did not provide the industry with what it needed to grow. As such, the biodiesel industry responded to government policy failure by selling its product to overseas markets, while the bioethanol industry preferred to focus on the non-fuel purpose market, which effectively ended the production of bioethanol for fuel purposes.

Other biofuel studies in countries such as such as Brazil (Wilkinson and Hererra, 2011) and the US (Gillon, 2010) have shown a strong political commitment to implementing a successful biofuel policy. In the context of Indonesia, strong political commitment from the top elites did not seem to exist in the same way. The government decision to rescind its biofuel subsidy policy in 2015 has further confirmed the lack of political commitment in implementing the biofuel policy. I have suggested that this may be, in part, due to incumbency associated with the fossil fuel industry, although to deepen the strength of such an assertion would require further research. Interestingly, I have highlighted how it was precisely the lack of government political commitment that created a new opportunity for the large palm oil industry, since, for reasons of economic policy, the government also promoted the palm oil down-streaming policy.

Prior to biofuel policy implementation, the government had already implemented a policy designed for the palm oil industry to down-stream its product. This policy was meant to increase economic growth and reduce unemployment, particularly within the small-scale farming industry. Yet, because palm oil-based biodiesel is categorized as a derivative product of palm oil, these two areas of policy (i.e. down-streaming and biofuel) intersected. With the government being inconsistent in implementing its biofuel policy, an opportunity emerged for the palm oil industry to comply with the government requirement to down-stream its product while maximising its profit by producing biodiesel (FAME), a palm oil derivative.

Oliviera et al. (2017) argue that biofuel policies implemented in countries such as Brazil, the USA and the EU are distorted in accordance with corporate interest for profit due to governmental interest in solving energy security problems. They argue that agro-fuel alliances within the biofuel system are benefiting from the respective government policies through subsidies, mandatory usage and export restrictions. Although the Indonesian biofuel policy follows a similar pattern to that discussed by Oliviera et al. (2017), it offers a new insight into a vicious circle created by the intersecting interests of private industrial stakeholders and governments.

In the Indonesian case the intersecting interests concern the government’s desire to boost economic growth and help small scale farmers by supporting biofuels, but without using public funds - and the palm oil industry wanting to keep the price of CPO in international markets stable to maintain its profits. By continuing to finance biofuel policy the government created demand for biodiesel, which, in turn, created demand for palm oil and led to an increase in the price of CPO. This underpinned the case for the CPO supporting fund (discussed in Chapter 7), which saw the funds provided by palm oil industries effectively being used as a subsidy for the biodiesel programme. Since the palm oil industry was already integrated with the biodiesel industry, the subsidy scheme in the CPO supporting fund meant that the palm oil industry was in essence paying its own subsidiary companies and using the government as legal basis for doing so.

This mechanism would ensure growing demand for CPO and stabilize or even increase CPO prices, maintaining the palm oil industry's profits, while also ensuring the government's aims of supporting farmers and boosting economic growth were met. The legal justification for the policy means the fund's existence can also be perceived as the palm oil industry providing support for the government's biofuel policy. As a consequence, the palm oil industry was able to garner further benefits in the form of government patronage due to its strategic role in assisting biofuel policy. The establishment of the CPO supporting fund has thus created a state-corporate partnership that is beneficial for both government and the palm oil industry which difficult to break due to the mutual relationship that has been formed. It becomes clear from this that large industries are able to capitalise on diverse forms of policy (including economic policy and legal frameworks) to effectively generate financial and political support from governments. This means that it is necessary to look beyond the remit and actions of the parts of governments focused on energy in order to more fully understand the politics of biofuels.

To conclude, this research has examined the political economic processes, both past and present, that have shaped the creation of agro-fuel alliances in the Indonesian biofuel energy system. The Indonesian case study has increased understanding of the politics of biofuels by opening up insight into the role of wider processes and policies (beyond energy policy) in shaping the emergence and consolidation of agro-fuel alliances. It has shown how the material nature of crops combine with policy to shape outcomes that are often at odds with those apparently intended by the government. In doing so, the research has highlighted the importance not only of looking beyond energy policy, but of analysing the historical context for policy development in order to provide a fuller picture of the emergence of contemporary biofuel policy.

This study thus makes a core contribution to the literature on biofuels within political ecology and agrarian political economy by advancing understanding of the constitution of agro-fuel alliances. Although biofuel policy and politics may vary with respect to the different countries and different geographical compositions, the case of Indonesia’s biofuel policy shows that large agro-industry involvement within the biofuel system is constituted through complex processes that emerge over time, not all of which are initiated by large industry but rather occur in response to policy, market conditions and material politics. Crucially, the extent to which political elites are engaged with the processes of policy implementation has been shown to be key in the delivery of intended outcomes. While in the case of the earlier policy on biofuels there was a clear lack of political will and elite engagement, later policy (which was initiated by industry) had clear involvement from elites to ensure it was realised in practice. This analysis might potentially explain the reason for the contradictions that appear to emerge between the promise of biofuel and the reality that occurs.

8.2. Future Research

This research has investigated the politics that shape contemporary biofuel policy implementation using a qualitative methodology and analytic approach. Although this research has covered the politics engulfing Indonesia's biofuel policy from its historical, market and governance perspectives, there are also areas that have not been covered in this research, which could be explored in depth through future research. I identify three specific areas through which the research could be taken forward and expanded.

First, there is a need to better understand global influences on domestic biofuel policy. This is because one of the reasons for Indonesia's government offering patronage to the palm oil industry was due to the banning of palm oil products in the export destination countries and the knock-on effects for the national economy. This research does not discuss why these export destination countries banned Indonesia's palm oil products, which actors were involved and how it was related to international biofuel politics. Such an examination of the interplay between domestic and global-regional policies within the international arena is thus signalled as a potentially important area for future research.

Second, there are important questions more concerned with the micro-politics of policy making and the role of policy makers across different scales of government in the development and implementation of biofuel policy. For the current research, this would mean undertaking research within the Indonesian Parliament, as most government policy is discussed with members of Parliament and requires their approval. Such a study could potentially challenge (or confirm) the argument I have (tentatively) mounted regarding insufficient political commitment being related to the incumbency of the fossil fuel industry. I highlight this because the current study only found a conflict of interest at the level of government officials and this could have been resolved with strong political commitment from the top political elite. Engagement with different scales of government in studies that build on this research would thus likely be important both within Indonesia and beyond.

Third, without the constraints of time, access and financing for the project, it would have been better to conduct a longer field study observation and to have undertaken more interviews. I would have particularly liked to have been able to gain better access to industry actors to develop deeper insights into their perspectives. This would have allowed for a stronger understanding of how actors from different spheres are interacting and influencing one another. This could also create new insights into how biofuel politics influences stakeholders' actions with implications for the trajectory of the biofuel policy.

8.3. Policy Implications

As a government official of the Ministry of Finance in Indonesia, I am also required to suggest solutions to the challenges and problems I have identified. This research offers important insights for practice, since biofuel industry performance in meeting government targets has been poor to date. Thus, the recommendations in this section are concerned with the potential for implementation of the research in the real-world context, particularly for Indonesia's policy makers. Nonetheless, this does not mean the recommendations are relevant only for Indonesia. There is a global growing interest in deploying low carbon energy systems along with mounting evidence that such processes have culminated in unwanted consequences arising during policy implementation (Castan-Broto, 2015) - as highlighted in this research biofuel policy is no exception to this trend.

Based on the discussion in the empirical chapters, I suggest two possible routes to help the government in achieving its biofuel policy target. Firstly, since I have argued that a key problem is one of political will from the top political elite, it is they who need to formulate stronger regulations at higher levels, such as Government Regulation and Presidential Regulation levels. This is due to the authority that these regulations hold which is stronger than a Ministerial regulation. Stronger regulation would also have the potential to force the government's elite officials to draft a biofuel incentive regulation that would benefit all biofuel producers, both biodiesel and bioethanol.

Secondly, since large agro-industry involvement is an integral part of biofuel policy, it is important to also limit its activity particularly in terms of expanding plantation sizes. This is because plantation companies could expand their plantation sizes by using the pretext of supporting the government's biofuel policy and such processes will require oversight to limit or prevent any negative effects from expansion. This would also require a strong commitment from the political elites, particularly the President. Moreover, limiting palm oil plantation expansion would also positively impact on the government lobby towards countries that banned palm oil and its derivative products. This is because palm oil plantation expansion is associated with the destruction of environment, biodiversity, livelihoods and culture. Thus, limiting expansion would show that Indonesia's palm oil products do not have to be associated with these negative issues.

These recommendations do not necessarily resolve the problems engulfing Indonesia’s biofuel policy implementation. Instead, the possibilities to fix the current state of Indonesia’s biofuel policy could also emerge outside the above recommendations. However, a changing policy would open new possibilities for future research and learning as the approaches evolve. Thus, the recommendations provided in this section could also be developed through an exploration of scenarios for implementing biofuel policy.

Appendix One

Interview Guide Questions

CENTRAL GOVERNMENT OFFICIAL RESPONDENTS

Theme: Biofuel Scaling

1. Tell me about your role or your unit role in delivering or implementing biofuel policy?
   Prompt (if answer is negative)
   - What about your role in delivering or implementing GHG emission reduction/agriculture policy?
   - How do you think of the correlation between GHG emission reduction/agriculture policy with biofuel policy?
2. How does biofuel policy being formulated?
   Prompt
   - How is it being formulated? Bottom up/top down process?
   - Who/which unit initiate it?
   - How is it correlated with other policy such as RPJMN and RAN GRK?
   - How is biofuel policy position within the undergoing national general energy plan (RUEN)?
3. How does biofuel policy being transmitted to the regional government?
   Prompt
   - How is it correlates with RPJMD policy?
   - Does all reg. govt. level (provincial and municipal/residential) have to create subsequent policy to implement biofuel policy or its feedstock?
   - Are there any evaluation for the implementation of biofuel policy in regional govt. (Provincial and municipal/residential)?
4. Are there consultation/hearings/discussion with the third party such as academicians, NGOs, private stakeholders, regional governments or local people when formulating the biofuel policy?
   Prompt
   - How strong does third party engagement with biofuel policy? Is it compulsory or optional?
   - Which level of reg. govt. strongly engage with this policy? Is it provincial or municipal/regent level?
   - Who are these private stakeholders? (Biofuel companies or CPO companies; private or SOE)
   - Which party have strongest influence? Is it NGO's or academician or private stakeholder or political will from the top?
5. How did you evaluate the biofuel mandatory blending policy?
   Prompt
   - Does the target ever achieve?
   - What are constraints and solution for unachieved target?
6. How is the role of CPO supporting fund (CSF) in achieving the mandatory blending policy? (asked to respondent from MoF, MERM, Bappenas and DEN)
   Prompt
   - Does price subsidy is the only mechanism to support blending policy?

- Do you think CSF is adequate to achieve the blending policy target (due to the increase demand for biofuel)?
- Any govt. program besides CSF to support biofuel policy?

Theme: Land Usage

7. What are the government roles in providing land for biofuel feedstock?
   Prompt
   - Is there any map for marginal land?
   - How is marginal land being defined?
   - How is your involvement in creating map for marginal land?
8. Are there hearing with the local and indigenous people before deciding sites for biofuel feedstock or palm plantation?
   Prompt
   - How do you resolve the land conflict for biofuel refinery sites or feedstock expansion?
   - Are there any active roles by the govt. as a mediator between private stakeholders with the local/indigenous people particularly in preventing land conflict?
9. How does ISPO role in preventing deforestation, forest fire and land conflict for biofuel feedstock? (Mainly asked to DEN, MoA, MoFE and Bappenas)
   Promtp
   - Do you think ISPO has positive impact for biofuel policy?
   -
10. Do you think govt. policies such as CSF, ISPO, RAN GRK are impacting biofuel policy?
    Prompt
    - Negatively/positively?
    - Are there other factors influencing biofuel policies?
11. Is there anything else you want to ask me?

REGIONAL GOVERNMENT OFFICIALS RESPONDENTS

Theme: Biofuel Scaling

1. Tell me about your role or your unit role in delivering or implementing biofuel policy?
   Prompt (if answer is negative)
   - What about your role in delivering or implementing GHG emission reduction/agriculture policy?
   - How do you think of the correlation between GHG emission reduction/agriculture policy with biofuel policy?
2. How does biofuel policy being formulated?
   Prompt
   - How is it being formulated? Bottom up/top down process?
   - If bottom up: Who/which unit initiate it? If top down: how do you follow up this policy?
3. How does biofuel policy being transmitted to the regional government?
   Prompt
   - How is it correlated with other policy such as RPJMD and RAN GRD?
   - How is biofuel policy position within the regional general energy plan (RUED)?
   - Are there any subsequent policies needed to implement biofuel policy or its feedstock at this govt. level?
   - Is there evaluation on biofuel policy implementation at this govt. level or by the central authority?
4. Are there consultation/hearings/discussion with the third party such as academicians, NGOs, private stakeholders or local people when formulating the biofuel policy at this government level?
   Prompt
   - How strong does third party engagement with biofuel policy? Is it compulsory or optional?
   - Who are these private stakeholders? (Biofuel companies or CPO companies; private or SOE)
   - Which party have strongest influence? Is it NGO's or academician or private stakeholder or political will from the top?

Theme: Land usage

5. What are the government roles in providing land for biofuel feedstock?
   Prompt
   - Is there any map for marginal land?
   - How is marginal land being defined?
   - How is your involvement in creating map for marginal land?
6. Are there hearing with the local and indigenous people before deciding sites for biofuel feedstock or palm plantation?
   Prompt
   - How do you resolve the land conflict for biofuel refinery sites or feedstock expansion?
   - Are there any active roles by the govt. at this level as a mediator between private stakeholders with the local/indigenous people particularly in preventing land conflict?
7. How does ISPO role in preventing deforestation, forest fire and land conflict for biofuel feedstock?

Prompt

- Do you think ISPO has positive impact for biofuel policy?
- Do you have any involvement with ISPO?

8. Do you think govt. policies such as CSF, ISPO, RAN GRD are impacting biofuel policy?

   Prompt

   - Negatively/positively?
   - Are there other factors influencing biofuel policies?

9. Is there anything else you want to ask me?

PRIVATE STAKEHOLDER RESPONDENTS

Theme: Biofuel Scaling

1. Tell me about your role in delivering or implementing biofuel policy?
2. How do you think on government target on B20 and the incoming B30?
   Prompt
   - Is it achievable or too ambitious? Why?
   - What are main policy instrument to support this target?
   - Does the current CSF scheme sufficient for biofuel industry to meet the B20 policy? Why?
3. What are the obstacles of the implementation of biofuel policy?
   Prompt
   - Are there problems in the bureaucracy (all level)?
   - Are there lack of support from govt.? which level?
   - What are other factors being obstacles for biofuel implementation?
4. Have you ever been involved in consultation/hearings/discussion with the government or NGO/academia when formulating or implementing/evaluating the biofuel policy?
   Prompt
   - Which government level?
   - Which NGO? Local/national/transnational?
   - Can you voice your concern of the policy during the meeting?
   - Are there any follow up with your meetings? (if any)
   - How do you access to government?

Theme: Land usage

5. Do you think other government policy, such as ISPO, RAN GRK/RAN GRD, CSF affected on the implementation of biofuel policy?
   Prompt
   - How do they affect the policy? Negatively or positively?
   - Is it related on issue such as land usage or others?
6. Does land availability is a major issue for biofuel development?
   Prompt
   - Do you think the issue involve only with its feedstock?
   - Are there issue on land availability for the refinery site?
7. Are there hearing with the local and indigenous people before deciding sites for biofuel feedstock or palm plantation?
   Prompt
   - How do you resolve the land conflict for biofuel refinery sites or feedstock expansion?
   - Are there any active roles by the govt. as a mediator between you with the local/indigenous people particularly in preventing land conflict?
8. Is there anything else you want to ask me?

NGO/ACADEMIA STAKEHOLDER RESPONDENTS

Theme: Biofuel Scaling

1. Tell me about your role in delivering or implementing biofuel policy?
2. How do you think on government target on B20 and the incoming B30?
   Prompt
   - Is it achievable or too ambitious? Why?
   - What are main policy instrument to support this target?
   - Does the current CSF scheme sufficient for biofuel industry to meet the B20 policy? Why?
3. What are the obstacles of the implementation of biofuel policy?
   Prompt
   - Are there problems in the bureaucracy (all level)?
   - Are there lack of support from govt.? which level?
   - What are other factors being obstacles for biofuel implementation?
4. Have you ever been involved in consultation/hearings/discussion with the government or private stakeholder when formulating or evaluating the biofuel policy?
   Prompt
   - Which government level?
   - Can you voice your concern of the policy during the meeting?
   - Are there any follow up with your suggestion after the meeting? (if any)
   - How do you access to government?

Theme: Land usage

5. Do you think other government policy, such as ISPO, RAN GRK/RAN GRD, CSF affected on the implementation of biofuel policy?
   Prompt
   - How do they affect the policy? Negatively or positively?
   - Is it related on issue such as land usage or others?
6. Does land availability is a major issue for biofuel development?
   Prompt
   - Do you think the issue involve only with its feedstock?
   - Are there issue on land availability for the refinery site?
7. Are there hearing with the local and indigenous people before deciding sites for biofuel feedstock or palm plantation?
   Prompt
   - How do you resolve the land conflict for biofuel refinery sites or feedstock expansion?
   - Are there any active roles by the govt. as a mediator between you with the local/indigenous people particularly in preventing land conflict?
8. Is there anything else you want to ask me?

Appendix Two

Coding Process Stage 1

Open code	Selective code
anxiety consequences of low fuel reserve indonesia become net oil importer country large trade deficit from energy sector 06 increase biofuel reduce fossil fuel 08 Main purpose for biofuel policy 14 main purpose of biofuel policy 22 importance of biofuel policy 9 reasons to pursue biofuel policy point out on Indonesia low fuel reserve	Energy crisis
mandatory blending value non enterprise entity production increased because subsidy 22 Opportunity of biofuel business propose solution energy exclude	Economic interest
Biofuel category as oil biofuel role Business opportunity Cheaper than fossil fuel contribution of biofuel to reduce trade deficit government want private sector to be involved in fuel reserve problem most of biofuel production goes to domestic market mutualism between private and governmnet potential benefit of biofuel 15 Value of biofuel policy 07 government policy	Biofuel potential
absent of regulation Power on MERM Regulated under MERM coordination with MoA close relation with top elit to force offcials to cooperate difficulty to cooperate MERM support biofuel industry	Power between central government ministry

Ministry of Agriculture support on biofuel first time cooperate with other ministry losing monopoly on power	
first founder Aprobi expenses Independency of biofuel industry Membership free simple rule The growing of biofuel industries	Biofuel industries
avoid food crisis 14 other types of biofuel 14 R&D for non CPO feedstock Not enough supply 9 Land problem for non CPO feedstock 16 disadvantage of using non CPO feedstock	Non edible feedstock disadvantage
16 MA helps farmer to plant Jathropa 9 Failure of Jathropa yiled of jathropa 16 absent of mills 16 Unfavourable small scale 16 Ministry of agriculture involvement 9 Farmer scepticism expensive 08 non CPO feedstock colaps the use of Jathropa as feedsctok	Failure of Jathropa
strategic of energy industry other country determine oil price importing fossil fuel yield higher profit fossil fuel import more profitable Hesitation on buying biofuel by Pertamina	Oil company & oil business
benefit of low CPO price CPO as feedstcok CPO availability 08 CPO advantage 22 At the beginning of biofuel CPO cheap 11 CPO advantage from land availability 14 abundance of CPO 14 CPO advantage 16 CPO as feedstcok 23 CPO advantage	Advantage of CPO as feedstock

07 palm oil dominance 9 advantage of CPO 9 cost efficiency 9 Biofuel problem of land minimal with CPO 9 CPO as the only viable option 9 no need to convert land	
16 CPO designated as energy crop 9 CPO become priority for feedstock 02 CPO companies relation 08 corporate resitant 22 CPO price compare with others 11 power on CPO companies	Positioning in biofuel sector
Relation with oil company oil price decline oil price skyrocketing less profit from biofuel issue on price 9 biofuel impact toward oil import business 9 domestic competition with fossil fuel trigered export 9 low domestic consumption trigred export 21 less prioritize by Pertamina 22 Pertamina disinterest with biofuel	Relation with fosiil fuel business
Pricing based on fuel quality in sulfur content 20 Pertamina is the biggest biofuel buyer Biofuel pays transportation cost Pertamina pays transportation cost pricing biofuel with oil Fierce competition compete with fossil fuel price disparity 23 power on Pertamina 21 Direct appointment to suply subsidized biofuel 22 closeness Resentful with pertamina	Power on Pertamina over biofuel industries
23 policy gatekeeper 23 politics of energy	gatekeeper

9 effect of invisible hand 9 invisible hand	
20 Involvement Pertamina in formulating biofuel policy but limited on pricing policy 08 Power on Pertamina 22 Power on Pertamina	Relation between Pertamina and central government
expensive biofuel price Fossil fuel cheaper than biofuel 23 CPO price volatility 22 Uncontrolable CPO price 22 CPO price increase CPO price increase	Feedstock price increase
Subsidy origin Subsidy to stimulate biofuel industry succesfull discussion with parlemen Fiscal incentive for biofuel industries government responsibility 21 Biofuel policy ineffective 08 Disussion with parliament Biofuel subsidy was first proposed to parliament complicated discussion	Subsidy introduces
reason behind biofuel subsidy ambitious policy 20 Biofuel policy depend on subsidy 20 Impact of subsidy	Mandatory blending policy
22 Biofuel FAME 22 the need to blend 9 efect of biofuel to engine 22 risk of using too much biofuel 22 ideal blending composition 22 Biofuel low calori level	The need to blend
21 biofuel policy under utilized 22 future solution 22 manufactured process of biofuel 22 real definition of mandatory blending 22 refining capacity	Underutilized
06 CPO companies bargain 08 palm oil dominance CPO down streaming industry	Power on the CPO companies

gatekeeper of biofuel andCPO company 22 options for production 15 GAPKI owned APROBI 15 involvement in the creation of policy 08 biofuel behemoth 22 control of large companies 22 CPO companies with refinery	
15 CPO companies suplied biofuel industry 22 Biofuel industry as part of CPO companies 22 biofuel and CPO industries mutualism 23 CPO companies support 22 Biofuel dependency on CPO Biofuel industries as part of CPO industries Biofuel to support CPO industry 14 Biofuel policy benefit CPO industry	Relations between biofuel and CPO Industry
22 CPO SOE ability 22 CPO company without refinery 9 Biofuel designated feddstock 22 the need of refining facility 22 price determinan 22 Large CPO companies 22 disproportionate ability 23 biodiesel dominate	CPO company advantage
impact of biofuel policy to CPO bussiness CPO companies does not own biofuel company CPO companies expand to biofuel industry	Impact of biofuel policy to CPO industry
Biofuel export to EU 14 Export of biofuel 22 price in EU 9 incompetitive price trigered export	Biofuel export
22 the role of biofuel on domestic market 22 Problem on price 22 independent biofuel industries shut down 22 independent biofuel industries start to die out 22 Biofuel more expensive 21 low export market 15 Oil price influenced biofuel demand overseas	Role of international market

15 overseas biofuel demand consequences for more biofuel production 07 Biofuel more expensive than fossil fuel	
Accused of being subsidized dumping issue biofuel industries with GOI try to counter subsidy accusation Export stop permanently issue hinders biofuel export to EU Trade issue Import halted	Subsidi and dumping issue
EU emmision standard EU opinion on CPO based biofuel	EU Emision standard and claim
emission issue Emission standar by palm based biofuel company	CPO company claim on emision standard
14 GHG calculation method 14 neglected of emission policy 14 no research on carbon emision 17 absent of evaluation 9 relation with carbon emmision reduction program 17 incapability of official 17 obscure relationship 22 Relation with GHG emission reduction	Pretext of emsission reduction program
08 biofuel impact to forestry 15 research stated that CPO did not caused deforestation 15 CPO companies are better 15 CPO companies are claimed to be unlikely to break the law 15 breaking the law 15 comparing with others on the past 15 the locals and smalholders as the culprit of deforestation 15 definition of forest	CPO association with deforestation
15 asert on reason 15 dispute on deforestation definition 15 legal and illegal deforestation 15 Legal by law 15 simplification of Illegal deforestation 15 unclear boundary 15 consensus to decide boundary	Deforestation for development
17 bottom up target setup	Unclear target of emission reduction

17 difference betwee 2 documents 17 difference between document 17 biofuel companies protested 17 NDC status 17 new target GHG reduction 17 Purpose for NDC	
22 calculating biofuel subsidy 22 Conversion cost 22 dispute on the amount of conversion cost 22 Gap created 22 Government decision with conversion cost 22 neglecting recomendation 22 role of BPDPKS	Conversion cost
Palm plantation recomendation Law on plantation CPO Supporting fund estabilishment CPO fund collected 07 Public hearing 07 efect of CPO supporting fund 15 Reduce in export 07 Main purpose of CPO fund scheme 07 primary task of BPDPKS	CPO Supporting fund
07 Fall of CPO price 07 opportunity from biofuel 15 Biofuel to stimulate price increase Decline on CPO demand and price 07 reason of price fall 15 low oversea demand reduce CPO price	Fall on CPO price
14 no impact to import 07 Biofuel does not reduce fuel import 14 target not achieve	Biofuel policy outcome
07 CPO reliability on land 08 biofuel as pretext for land grab 15 Expansion of plantation 21 utility of land	Land for biofuels
22 Land belongs to CPO plantation 08 benefit of single land ownership 08 land profiting 08 land securing	Land profiting

9 difficulty on obtaining large area 08 securing land for CPO	
08 Land speculators 02 government decide the designated of land 07 government involvement in land management 07 Land use purpose	Purpose of land
08 amount of land to obtain 08 the locals loss 11 begining to come 11 peaceful takeover 15 no dedicated plantation for biofuel 15 reason for LUC	Huge chunk of land
02 difference 02 public hearing for spatial plan 02 representative 02 time frame for spatial plan 11 spatial planning 11 spatial planning is central authority 15 pointing on constitutional court 16 LUC is not MA concern 9 problem on spatial planing 9 the use of marker in map image 9 unfeasible solution for land problem	problem in spatial planning
little use of biofuel subsidy similarity of cause Subsidy reduced 22 independent biofuel companies reluctant reason to cut biofuel subsidy 22 government subsidy Biofuel subsidy stop	Inefective subsidy
9 problem on infrastructur 23 problem on distribution 9 problem with distribution 9 problem on supply 08 uneven distribution 14 infrastructure problem Distribution chain good 20 Distribution problem	Problems on infrastructure
06 short term over long term 08 policy maker wants 08 popular policy favorable	Lack of goodwill
incentive rejected	Inefective incentive

Involvement fo MoF resentment	
obstacle Governmnet budget mechanism government policy is the main problem	System
Impact on smalholders Impact on export farmer suffer most 15 Smalholders loss 16 farmers dependency with large plantation	Consequences of stoping biofuel policy
11 same treatment with oil industry as suggestion 22 if CPO price controled it reduces price 23 future solution 14 future solution	CPO price control
22 impact on farmer and smalholders 15 Transfer of payment due to export levy 15 disproportionate burden 14 Farmer sufer 07 smallholder and farmer loss	consequences of controling CPO price
CPO Fund shrink government unfair proposed policy changing system different opinion 06 inconsistent policy 08 inconsistency of policy government judment	Government inconsistency
08 CPO companies profitering 15 open market for CPO 22 Advantage of large CPO companies 15 conglomeration of agroindustry 9 CPO price problem	Opportunity for CPO industries
consequences on govertment negligience problem on feedstcok Biofuel capacity underutilized biofuel policy stagnate 22 concern of power difference	consequences on govertment inconsistency
07 Centralized policy	centralized policy

02 Municipal government very little role 06 official incapaility 11 regional govt involvement 14 insignificant reg govt role 16 Regional governmnet role 21 Centralized policy	
Regional government in favour of biofuel industry Regional government welcome biofuel industry 08 regional government openes 11 regional government role 11 regional governmnet role 9 regional government role	Regional government support on biofuel policy
08 ease on permit 11 regional government authorithy 08 reg govt endorsement 9 effect of desentralization	Misused of Reg. government endorsement for biofuel industry
9 problem on soft skill 9 regional government incapability 11 vary in problem 06 uneven ability 06 translating the policy 9 unclear authority 16 rigid beurocracy	Regional governmnet problems
11 regional dependent on central 06 less coordination 11 different perception 07 Biofuel inside	Relations between central and regional
11 future solution 11 strenghten authority 9 More authority for regional government 06 future solution	Increase authorithy
08 Government support on land speculan	Impact of problems

11 eager but unable	
9 attempt to verify data 9 fault occurance 15 Data inacuracy 22 Land belong to the locals 22 Land is scarce 9 land grab by the people	inacuracy of land data
Claim debunk claim on B20 22 claim on B20 debunk 14 claim on B20 06 supportive for mandatory blending policy 14 policy evaluation	B20 Mandatory
17 intangible hierarchy in accessing information 08 Gov official knowledged 14 Official capacity 22 avoiding responsibility 22 Incapability of official 22 difference trajectory 22 different scale	Different scale different knowledge
9 intangible hierarchy 06 Macro and micro policy 06 power on Bappenas 08 invisible hierarchy 22 Power on MERM 9 deadlock settled by president 9 limited capacity	Invisible hierarchy
06 less priority in public hearing 08 less priority for scientific reason 9 paradox of policy 9 problem of comitmen 9 problem of leadership 9 role of academician	biofuel complex
9 difficulties to amend policy of spatial planning 9 land availability 9 Problem on permit	Land and spatial planing

9 regional government lack participation 11 chain of command 11 sektoral regulation	
difficult process 11 official suspicious 22 Government red tape 9 future solution 08 biofuel industry being accepted 08 people acceptance 06 unclear position 14 subsidize biofuel 15 contentious of export duties 15 different activity companies of CPO 15 El Nino reduced CPO production 15 GAPKI agree with export duties 22 influence of car manufacturer 9 car manufacturer reluctant 9 consumer lack of choice 9 DEN main task 9 Mysterious source 9 primary stakeholder of biofuel policy 9 problem on pricing policy 9 testing limited capability 9 unverified data	Uncoded script

Appendix Three

Coding Process Stage 2

No	Selective codes	Themes						
		1	2	3	4	5	6	7
1	Energy crisis							
2	Economic interest							
3	Biofuel potential							
4	Power between central government ministry							
5	Biofuel industries							
6	Non edible feedstock disadvantage							
7	Failure of Jathropa							
8	Oil company & oil business							
9	Advantage of CPO as feedstock							
10	Positioning in biofuel sector							
11	Relation with fosiil fuel business							
12	Power on Pertamina over biofuel industries							
13	gatekeeper							
14	Relation between Pertamina and central government							
15	Feedstock price increase							
16	Subsidy introduces							
17	Mandatory blending policy							
18	The need to blend							
19	Underutilized							
20	Power on the CPO companies							
21	Relations between biofuel and CPO Industry							
22	CPO company advantage							
23	Impact of biofuel policy to CPO industry							
24	Biofuel export							
25	Role of international market							
26	Subsidi and dumping issue							
27	EU Emision standard and claim							
28	CPO company claim on emision standard							
29	Pretext of emission reduction program							
30	CPO association with deforestation							
31	Deforestation for development							
32	Unclear target of emission reduction							
33	Conversion cost							
34	CPO Supporting fund							
35	Fall on CPO price							
36	Biofuel policy outcome							
37	Land for biofuels							
38	Land profiting							
39	Purpose of land							
40	Huge chunk of land							
41	problem in spatial planning							
42	Inefective subsidy							
43	Problems on infrastructure							
44	Lack of goodwill							
45	Inefective incentive							
46	System							
47	Consequences of stoping biofuel policy							
48	CPO price control							
49	consequences of controling CPO price							
50	Government inconsistency							
51	Opportunity for CPO industries							
52	consequences on govertment inconsistency							
53	centralized policy							
54	Regional government support on biofuel policy							
55	Misused of Reg. government endorsement for biofuel industry							
56	Regional governmnet problems							
57	Relations between central and regional							
58	Increase authorithy							
59	Impact of problems							
60	inacuracy of land data							
61	B20 Mandatory							
62	Different scale different knowledge							
63	Invisible hierarchy							
64	biofuel complex							
65	Land and spatial planing							

Appendix Four

Sample of Interview Transcript (Private Stakeholder)

Backgroundnya chemical enginer kemudian setelah itu masuk ke industri pupuk urea dan ammonia di kawasan aceh. Kemudian sempat jadi guru setelah itu terjadi konflik aceh mundur bergabung dengan teman-teman buat bisnis biodiesel tahun 2006. Bekerja sama dengan PTPN IV. Perusahaannya punya anak ITB alumni tahun 77, mereka kumpul untuk bikin perusahaan.

Waktu bikin perusahaan ini harga solar HSD masih jauh berbeda dengan CPO sebagai bahan baku waktu itu masih USD400 per ton jadi hitungannya masuk dibikinlah di adolina. PTPN IV juga support bahan baku. Feedstock waktu itu sudah pake sawit karena arah kita adalah untuk green energy dalam perjalannnanya saya disuruh membangun pabrik itu di adolina berjalan di tahun 2006-2008 produksi setahun tiba-tiba harga CPO meningkat terus, bahan bakunya sendiri sudah melebihi harga HSD, sehingga tidak masuk akal. Akhirnya tutuplah pabrik itu.

Gagasan waktu itu ada beberapa temen di PTPN IV alumni ITB dengan gagasan untuk membuat pabrik biodiesel. karna waktu dihitung semua dengan berbagai analisis bahwa itungannya masuk semua untuk profit. PTPN IV juga mendukung karena untuk dipakai sendiri oleh PTPN IV karna kebutuhan mereka juga sudah cukup banyak. Untuk transportasi, genset, dll. Produksi sekitar 10 ton perhari yaitu FAME. FAME tidak bisa di gunakan seluruhnya untuk mesin kendaraan. Pertama di rekomendasikan 5%, 10% dan 15% kemudian 20% walaupun belakangannya asosiasi otomotif jepang merekomendasikan untuk mobil-mobil mereka 7.5%. Kalau pemerintah ngomong pakai 20% itu bohong itu. Gak ngerti dia masin asal ngomong aja.

Angka 20% gak tau darimana, karena resminya otomotif jepang menerbitkan rekomendasi yaitu B7.5 dan dikirim ke pertamina. Pertamina pegang surat itu tapi orang2 ya gitu.

Rekomendasi diberikan tahun 2008, waktu itu mobil-mobil jepang sudah disesuaikan kesitu (7.5%) memang dulu ada mobil lama dengan karet itu bisa lumer kalo kena FAME tapi yang belakangan mobil baru tetap direkomendasikan 7.5% pertimbangannya waktu itu apa gak tau. Nah berbarengan dengan itu muncul teknologi baru. Energy biodiesel generasi 1.5 yaitu hydrogenated vegetable oil jadi minyak sawit ini dinjeksikan dengan gas Hidrogen itu keluar langsung minyak solar persis seperti minyak solar fosil. Ada produk samping …. Jetfoil macam-macam. Itu dirintis oleh BIOPI ENI dan Nestee Oil. Singapur bikinnya sehingga dosen saya datang kesan melihat. uDah berjalan itu sekarang sekitar tahun 2013 provennya termasuk untuk scale up nya.

Nah berdasarkanitu juga akhirnya PTPN IV mencoba kerjasama dengan Pertamina, bikin kerjasama dengan Pertamina bagaimana kalau kita membangun itu bikinlah FS riset panggil Force n Sulivan sebagai konsultannya. Itukan termasuk konsultan top dunia, 10 besar lah. Kita kaji lah….

Dalam proses kajian itu terbentur pada masalah harga. Harga feedstock kita sudah tahu tinggi, tapi untuk pasar eropa itu masih masuk. Karena di Eropa dan USA 1 Liter HSD itu hampir 1 euro itu kan Rp13.000 (saat itu) sudah sangat ok banged.

Harga pokok produksinya itu kalo kita kurangi selisihnya banyak. Harga pokok termasuk bahan baku? Saya kalau melihat harga pokok sering bahan baku saya keluarkan karena bahan baku sangat fluktuatif. Kalau saya ngomong harga sekian maka aka nada pertanyaan di saat harga berapa? Gitu

Maka saya selalu menggunakan conversion cost istilahnya. Dengan perjalannan itu, artinya pemerintahpun sibuk dengan harga tersebut. Dan pemerintah tidak bisa membedakan jenis biodiesel itu. pokoknya semua yang keluar dari minyak nabati itu disebut biosolar. Padahal itu berbeda (produk dan prosesnya). Keluarlah kebijakan harga biodiesel itu setara harga CPO + USD125. Itu ada Kepmen nya. Nah kalau dengan USD125 gak masuk, pas aja kalau kita menggunakan CPO. Itu yang mengeluarkan Kepmen adalah ESDM (mandatory blending). Dan yang lucunya lagi yang menerbitkan itu adalah ESDM yang disuruh beli adalah pertamina, pertamina ada di bawah Kemen BUMN nolak seringkali. Karena anggarannya beda untuk subsidinya. Jual FAME ke pertamina kan harus di subsidi jualnya 125 (harga pokok produksi) masih lebih tinggi sementara HSD yang dijual pertamina lebih rendah. Mereka ada alokasi subsidinya.

Nah ini yang ngomong itu pemerintah bicara belum 1 kamar. Itu pangkal Indonesia seperti itu

Saya baca Malaysia, yang basisnya bukan CPO tapi RBDPO yaitu CPO yang sudah diambil asam, jadi sedikit lebih mahal ditambah USD120 kalau gak salah itu masuk dan itu yang ngatur petronas. Semua dibawah petronas.

Ini gak, ada 2 departemen yang berbeda yang satu ngomong ini yang satu suruh beli kalau gak beli masalah.

Nah tetap hidup bagi beberapa perusahaan yang sudah punya refinery tapi dia tidak menggunakan CPO sebagai bahan baku tetapi produk samping dari refinery sawitnya yang lagi bikin saat ini. Yaitu PFAD dan stearin di harga di pasar ini PFAD kira-kira 75% CPO nah ada (pengiritan 20%) yang RBD stearin 95% harga CPO (dapat pengiritan 5% disitu). Di tetapkan sama dia segitu dibikin biodiesel tapi di hitung mereka pake harga CPO +USD125 cukup.

Tapi bagi perusahaan yang tidak punya refinery gak bisa masuk langsung ke biodiesel. maka itu bermainlah disitu Wilmar, Musim Mas, sinar mas, dia masih hidup karena sudah punya refinery jadi bahan baku yang dipakai adalah produk sampingnya. Kalau perusahaan yang gak punya refinery, maka harus beli CPO dulu sehingga mahal. Menurut saya strategi yang sudah punya refinery yang menetapkan 125 karena sebelumnya keluar draf 188 yaitu CPO +USD188 sebagai harga biodiesel per ton kemudian entah kenapa yang berlaku menjadi permen adalah CPO +125.

Harga segitu bagi pengusaha biodiesel murni sangat kecil untungnya malah gaka da untung karna 125 itu conversion cost. Conversation cost adalah semua bisaya yang timbul dalam membuat 1 ton biodiesel (tenaga kerja, utilitasm chemical, dll) untuk konversi ke liter tinggal kali 0.86 aja.

Akhirnya kami yang di PTPN yang merintis itu, kalau turun ke 125 ya berhenti gak jadi (untung) lebih baik jual CPO saja. Perusahaan besar pengen di 125 saya curiga jahatnya untuk mengurangi competitor jadi mereka yang gak punya refinery gak bisa masuk ke sini. Kalau dia masuk kesini harus investasi di refinery dulu. Orang mikir sementara kapasitas refinery (untuk minyak goreng) di Indonesia sudah 2 kali lipat dari kebutuhan. Kecuali kebijakan khusus kayak kita buat ini merupakan amanat pemerintah ini. Supaya kestabilan harga minyak makan tidak dimainkan begini-begini.

(sehingga dalam hal ini perusahaan sawit besar menjadi pelaku monopoli di industry biodiesel yang bisa mengontrol harga pasokan biodiesel). perkebunan besar yang sudah punya refinery (yang masuk bisnis biodiesel). PTPN IV tidak punya refinery, baru dibuat yg di Sei Mangke. Tidak ada BUMN yang memiliki refinery, semua hanya jual sawit (CPO). Tidak ada satupun PTPN yang memiliki fasilitas hilirisasi industri sawit. PTPN baru buat refinery karena ada penugasan langsung dari presiden untuk bikin refinery supaya dapat mengontrol/mengendalikan harga minyak makan.

Mulailah start FS dan lain-lain walaupun setelah FS refinery tidak begitu bagus juga karena minyak makan sudah sangat dikendalikan oleh mereka (PBS) itu namanya merk 5 besar musim mas, wilmar, sinar mas ya kelompok-kelompok itulah yng sudah maju, yang kita masuk ke sektor itu sudah sulit kecuali masuk pada segmen murah yang seperti minyak getas, pemerintah nyuruh supaya minyak dijual dikemasan kecil-kecil yaitu kemasan seliter-seliter tapi kemasannya tidak menarik dalam bentuk bantal (bukan botol pet) jadi gak bisa di tegakkan. Itu untuk mengimbangi, kalau itu mahal beli yang ini, harganya Cuma Rp11 ribu kalau yang biasa kan RP13 ribuan.

Jadi dengan harga CPO sekarang rata-rata USD600 per ton dengan biaya olah sudah cukup tinggi itu menyebabkan tidak terlalu bagus dari sisi keekonomian harga minyak makan. Tapi buat mereka masih bisa karena sudah dikontrol harga oleh mereka. Kapasitas refinery nasional sekitar 15 juta ton per tahun hanyak untuk menjadi minyak makan. Kemudoan dari 15 juta yang terpasang yang hidup Cuma 8 juta setengahnya karena kebutuhan nasional itu sekitar 5 juta ton sisanya ekspor. Padahal produksi sawit sekitar 22 juta ton (versi pak munir bukan versi Kementan). Versi Kementan terlalu optimis (30 juta ton), gak sampai belum tahap itu, memang akan menuju kesana mengingat kita masih muda (perkebunannya) tapi setahun 2 tahun terakhir dikeluarkan ya sekitar 22-23 juta ton memang kita sudah lebih dari Malaysia.

22 juta ton sudah termasuk smallholder. Data ini dari GAPKI, saya lebih percaya kepada GAPKI. Gak masuk akal kalau mencapai 30 juta ton karena produktivitas nasional antara 3.5- 4 ton CPO per hektar kalau Malaysia sudah menuju 4-5 ton per hektar. Tapi kalau melihat angka-angka kebun BUMN sudah mencapai angka 5 ton tapi kebun rakyat paling Cuma 2-3 ton per hektar. Itu yang terlalu optimis dipakai oleh deptan untuk cari nama juga dia. Karena yang punya masyarakat kan gak ter record. Yang terrecord yang punya perkebunan, yang masyrakata Cuma estimasi saja yang terlalu optimist pada hal kenyataan gak seperti itu. jadi ketauan kita beli yang masyarakat itu rendemennya aja. 22 juta ton produksi tahun 2015 sisa yang diluar kapasitas refinery di ekspor dalam bentuk CPO.

TBS masuk mills keluar CPO baru refine untuk turunannya. Pas refine keluar 3 macam yaitu minyak makan, PFAD, Stearin. Dari sini baru turunn banyak sekali termasuk FAME. FAME belum jadi dari CPO tapi cara menentukan harganya dari CPO. Kalau ingin masuk ke FAME langsung dari CPO boleh, jadi mau bikin FAME itu banyak skema, langsung dari CPO yang keluar langsung dari mill bisa bikin kemudian dari turunan PFAD juga bisa bikin dari stearin juga bisa. Pokoknya yang prinsipnya lemak nabati semua bisa berproses menjadi biodiesel tapi dengan ada plus minusnya. Yaitu beda jenis input beda biaya yaitu akhirnya bermain dengan konsep riset yang bagus.

Seperti si wilmar yaitu dalam kondisi seperti ini bagusnya CPO aja dalam kondisi seperti ini kita olah dulu trus ini baru bikin jadi sangat dinamik. Karena Bea keluar itu tinggal ngitung-ngitung kalau saya mengekspor hilir yang sudah di olah bea keluarnya sekian kalau buat CPO biayanya sekian. Bea kluar itu kalau kita mengeluarkan CPO murni karna tujuannya supaya orang ngolah di dalam.

Itu CPO tambah 125 sudah lebih tinggi dari HSD sementara kalau kita menggunakan bahan baku CPO sebagai input biodiesel masih belum untung karena 125 conversion cost kita belum dapat apa-apa. Bisa kita hitung aja lah, ini kan 578 (harga CPO per ton) saat ini. Tambah 125 berarti ini menjadi 703 per ton kali 13400 (kurs) terus dibagi lagi 0.86 kira-kira. Ini menurut cerita per tonjadi tinggal ini kali 0.86/7. Ini, makanya itu tidak masuk makanya gak hidup sebetulnya bagi yang tidak punya refinery. Kalau menggunakan harga itu dapat 9420 rupiah per kilo perliter kali 0.87 dapat 6.987 ini harga yang dibeli pemerintah, makanya ada subsidi. Berapa harga yang ada di pasar? Selisih dengan harga pasar itu yang disubsidi. Subsidi Ini yang diminta untuk dibebankan kepada pertamina. Pertamina mau tapi pertamina masalahnya terkadang bayarnya 3 bulan sekali, turun subsidinya dulu dari pusat. Pengusaha disuruh nanggung 3 bulan kan itu cash, akhirnya apda gak mau, nah caranya di akali oleh yang sudah punya refinery. Ini bukan segini tapi 578 x 0.75 pake PFAD yang merupakan pecahan dari CPO begitu kita olah keluar minyak makan atau olein. Keluar PFAD (5%) dan stearin (8%) harganya kira-kira 70 sekian persen sisanya lari. Ini yang dipakai sebagai bahan baku (PFAD dan stearin). Karna harga PFAD kira-kira 0.75CPO dan stearin 0.95CPO jadi dia dapat untung dari sini. (PBS dapat menekan biaya bahan baku). Jadi dia dapat harga ini (CPO) Dibeli pemerintah pake harga CPO tapi dai dapat untung dari pakai limbah pengolahan.

Ini tidak dapat dilakukan oleh pengusaha yang tidak punya refinery karena conversion costnya sendiri gak segini. Tapi kalau boleh ekspor dengan harga internasional ini bagus bisa mencapai harga 400. Harga international CPO 578 ditambah 400 kalo harga internasionaljadi kalao kita equivalenkan harga biodiesel mereka disini kira-kira ada split disini 400 dengan harga CPO. Jadi kalau di internasional seperti ini, karena harga biodiesel internasional itu sudah mencapai 0.8 USD per liter.

Kalau conversion cost 188 masih masuk.

Dengan conversion cost rendah banyak yang mati yang kecil-kecil (industri biodiesel).

Pabrik bagus tapi bahan baku terputus-putus

BPDPKS muncul yang hidup Cuma pengusaha sawit yang juga bergerak di bidang biodiesel. yang pengusaha biodiesel murni sudah mati semua. BPDPKS hanya menciptakan gap yang makin lebar antara pengusaha yang sudah maju dengan yang masih kecil. (dengan kata lain industri biodiesel bisa tetap hidup walau tanpa ada BPDPKS dengan mekanisme subsidi yang ada) perusahaan sawit besar hidup.

Aspek teknikal 7.5% campuran dalam mesin kendaraan tapi campuran 20% bisa dilakukan dengan risiko di tanggung sendiri. Kalau truk-truk sawit itu mereka memang gak peduli, buat jangka pendek gak kenapa pakai saja untuk 1 atau 2 tahun, tapi kalau untuk penggunaan jangka panjang karna kita gak tau rekomendasi 7.5% itu atas dasar riset atau …..(tanpa ada keterangan). Cuma dia secara resmi membuat surat ke pertamina silakan telusuri sendiri. Cari surat rekomendasi dari asosiasi perusahaan lihat berapa persen yang di rekomendasikan.

Dulu saya punya temen sempet dikopikan tapi sudah hilang. Mengapa pertamina tidak tertarik untuk masuk ke biodiesel FAME dia minta kita lsg masuk kedalam greendiesel karena itu memang drp in sifatnya, bisa dipake 100% (B100). Biodiesel kita masih FAME. Karena biodiesel FAME itu dasarnya bukan biodiesel itu adalah bahan pelarut yang ternyata memiliki karakteristik sifatnya sama dengan bahan bakar. Dengan sedikit nilai bakar yang rendah ya gapapa, tapi sebenarnya dia itu pelarut.

Kalau B30 saya setuju asalkan bukan FAME yang greendiesel. Karna itu tinggal drop in. Gak dicampur juga gak apa-apa. Secara mix nasional disini bukan dicampur yaitu kombinasi secara nasional yaitu biofuel 30% yang 70% fosil itu itu pengertiannya. Bukan berarti 30% itu dicampur (di mesin) bukan. (dengan kata lain ada dua jenis BBM). Karena masih FAME makanya campuran. Arahnya B30 harusnya greendiesel. Kalau pake greendiesel sudah langsung drop in aja. Untuk masalah harga, kembali lagi. Karena pemerintah tidak membedakan antara harga FAME atau bukan. Walaupun greendiesel gini juga rumusnya, itu yang jadi masalah. Gak dibedakan karena terminology pemerintah untuk biofuel ya biofuel aja (BBN) atau bahan bakar lain. Tidak ada istilah biodiesel atau greendiesel. Jadi apapun yang namanya bukan fosil masuk kategori bahan bakar lain (BBN). Nah, kalau pake greendiesel lebih gak cukup 125. Karena greendiesel adalah CPO di injeksikan dengan H_2 (hydrogen) langsung nanti akan keluar 3 jenis produk green diesel, jet fuel, propane.

Jet fuel untuk bahan bakar jet, propane untuk LPG bisa.

Factor penambahnya bukan 125 dan hydrogen ini dibuat dari gas alam, makanya industri ini harus muncul pada lokasi yang ada natural gas butuhnya Cuma sedikit tapi harganya gak segitu. Gas alam ini di crack jadi hydrogen. Ada pabrik untuk proses reforming (crak) dan industri ini sudah banyak di Indonesia terutama pabrik pupuk. Infrastruktur greendiesel Indonesia belum siap. Untuk di Sei Mangke sebenernya sudah layak karena gas sudah masuk di sini. Cuma masalah harga saja yang beda dan harga gas harus masuk ke conversion cost 125 yang jelas tidak cukup.

Pemerintah juga belum bisa membedakan jenis biodiesel FAME dan greendiesel, itu seharusnya dibuka harus masuk orang praktisi disitu, dibuka ini loh begini begini biar ngerti.

Yang bilang dicampur 30% itu siapa? (pemerintah) gak bisa donk yang punya mobil (yang harusnya nentuin). Ada pak imam dari ITB saya kenal. Dia kan bukan pemilik teknologi mesin yang punya mesin itu ya harus asosiasinya yang nerbitin itu. samalah kalau kita punya mobil, mobil ini say buat untuk pertamax. Kan dia bilang kalau gak pke pertamax ya tanggung jawab sendiri. Kan gitu kan. Ini pake untuk premium kalo pake pertamax boleh kalau ada sesuatu tanggung sendiri bisa gitu juga sih. Tapi kan masalahnya harus kita kembali ke mobil siapa yang dipake, teknologi siapa, harus confirm dengan mereka. Tidak bisa kita riset sendiri tanpa libatin mereka (manufaktur company). Selama ini risetnya sendiri ya pak imam itu ITB, di uji sama beliau. Itukan short term. Terus ini dampaknya gimana? Belum pernah kan di riset sampe berapa tahun untuk lihat dampak mesin. Paling mereka uji bakar gimana itu efek ke mesin bakar torque. Dia memang ahli disitu. Tapi saya bilang, itu pak imam kan baru uji sekali dua kali di lab bapak, mobil orang dipake 5 tahun baru ketahuan hasilnya.

Gak tau saya, tapi begitu rapat-rapat gitu pertamina pun gitu. Kalau ada rapat bersama pemerintah gak ada yang berani ngomong di depan pengambil keputusan tapi baru ngomong ke kita macam-macam sedang di ruang rapat gak berani ngomong. Kenapa ya tidak tahu.

Tapi kalo kita gak percaya rekomendasi riset kita ya boleh-boleh saja pakenya tapikan tidak dalam dampak waktu dekat. (riset yang digunakan Cuma riset di lab saja) dan tidak mengacu kepada rekomendasi pabrikan mobilnya.

Yang banyak dilibatkan (untuk biofuel) pertamina sedangkan swasta seperti Gaikindo tidak terlalu.

Banyak yang gak terbuka untuk bicara soal biofuel. (hasil curcol)

(pertamina gak berani bicara langsung kepada menteri karena bisa dicopot jabatannya)

Riset kita kurang valid karena shorttime berbeda dengan riset yang dilakukan asoisasi otomotof jepang yang bersifat longitudinal.

Tidak ada counter untuk sebuah rekomendasi riset, sehingga pada dasarnya hanya ada 1 periset yang melakukan itu (terbatas). Pemerintah (pejabatnya) juga tidak percaya sama sekali bahwa fuel energy kita akan habis dalam waktu 10 tahun ke depan yang ngomong Cuma pejabat secara pribadi tapi tidak tercermin dalam kebijakan yang dikeluarkan oleh instansinya. Jadi pejabat A ngomong itu B ngomong ini tapi institusinya melakukan apa berdasarkan ngomongan itu. itu yang tidak pernah muncul ke permukaaan (yaitu dalam bentuk design policy).

Terkait masalah ijin:

Saya tidak mengatakan jelek tapi tidak baik juga. Standar lah birokrasi Indonesia. Walaupun sudah didengungkan sudah banyak perubahan tapi kenyataannya ya masih begitu. Contoh untuk kawasan berikat Sei Mangke perijinannya sendiri juga masih luar biasa banyaknya. Untuk bikin refinery ini kita butuh banyak aturan. Kenapa tidak disederhanakan atau dikeluarkan oleh 1 lembaga saja. Ini daftar regulasi yang dibuthkan untuk sebuah pabrik (19 aturan/ijin) harus ada semua kenapa gak disederhanakan padahal kan banyak yang bisa di gabung-gabung 1 instansi ngeluaring berapa ijin sekaligus.

Terkait PTSP: yah itu satu pintu (dengan sindiran soal 19 ijin). Yang 1 pintu ini Cuma pemda (tapi diralat) tidak ada 1 pintu disini. Untuk bisa beroperasi sebagai sebuah perusahaan normal semua ijin harus ada. PT INL ini refinery untuk produksi minyak makan bukan untuk biofuel (ini berikutnya). Walaupun untuk kawasan industri (ijin masih banyak) di luar kawasan mungkin lebih banyak lagi. Makanya kalau dibilang sederhana dimana sederhananya. Dari 19 baru 6 yang selesai (dari tahun 2016) yang strip2 belum dimulai karena bisa ditunda tapi wajib ada begitu mau edarkan makanan kalau gak di tangkap polisi tuh, di anggap barang tidak layak

(Terpotong beberapa menit)

Kalau pertamina mau membeli sehingga pembayaran tidak tertunda ada manfaatnya mendukung kawasan Sumu (ini pendapat terkait pembiayaan biofuel dengan asumsi tanpa BPDPKS). Kemaren memang ada aturan yang 125 ini adalah di gate di pabrik belum termasuk ongkos angkut dan ongkos angkut di atur.

Jika pakai green diesel conversion cost lebih dari 125 dan sudah ada kajiannya. Harga gas itu bisa dikontrol oleh pemerintah. Kalau CPO gak bisa di atur oleh pemerintah.

(this interview has been off topic on some part particularly after I received some new information but uncertain if that's related or not with the research. This is the moment where I got carried away).

Angka 188 merupakan draft yang dikeluarkan awal (waktu diskusi dengan stakeholder) dan saya gunakan masuk tapi berubah jadi 125 pas aturan ditandatangan dan diterbitkan.

(Dalam hal ini sulit untuk diketahui darimana asal usul angka yang diajukan untuk conversion cost, pak munir menganggap angka itu diajukan oleh PBS, tapi biar bagaimana angka tersebut pada posisi ini hanya menguntungkan pemerintah dalam jangka pendek, tetapi justru memberikan disinsentif bagi industry biofuel/biodiesel dalam jangka panjang. Karena industri ini menjadi sangat tergantung pada industri feedstock dan tidak menutup kemungkinan malah menciptakan konglomerasi yang lebih besar untuk indsutri feedstock, dalam hal ini sawit)

Artinya kalau menggunakan angka 125 ya pegusaha kan bukan gotong royong jadi mereka tidak rugi tapi tidak menarik karena return terlalu lama, tidak ekonomis dan lain-lain.

Harga biodiesel walaupun produksi secara masal akan sangat sulit untuk turun karena ada factor feedstock, sehingga harga biodiesel sangat tergantung dengan harga CPO (semakin mahal maka biodiesel semakin mahal dan sebaliknya). Pemerintah tidak bisa meng cap harga CPO karena kana membuat orang hulu marah. Begitu CPO dipaksa turun, maka TBS turun, begitu TBS turun kebunnya gak hidup begitu kebun gak hidup maka perawatannya asal-asalan gak di pupuk gak disiram. Walhasil rendemen turun. Kebijakan pemerintah ada di hilir sawit (biodiesel) tetapi sambil menjaga agar harga CPO tidak turun, karena yang terdampak juga petani sawit kecil yang jumlahnya 50% dari total petani. Apabila TBS turun maka petani tidak akan menanam sawit lagi tapi bisa ganti tanaman lain (jadi mirip dengan jathropa) jadi harus hati-hati. Pemerinta harus membuat ini sedemikian rupa seimbang. Saya ada kajian berapa ini seimbangnya (Tapi dipotong oleh gw argggghhh)

(There is a big problem that I always chip in the midle of respondent speech)

Atau kembali kaya eropa dimana biofuel seliter 1 euro. Orang eropa sangat takut CPO kita karena murah/ CPO kita gak di band di Eropa.

Mereka (eropa) juga melindungi petani mereka terutama rapeseed karena lebih mahal dari pada CPO.

Saya coba mengakji kemaren, mulai dari petani, berapa sih harga wajar TBS. jadi saya coba korelasikan kalau dia nanam padi, returnya berapa. Kira-kira jangan beda-beda dari padi kalo gak dia potong ini nanam padi darat begitu ditetapkan harganya. Baru kita hitung dari TBS ke mill itu berapa costnya maka itulah harga CPO yang masuk akal bagi petani. Kalau ternyata harga CPO terlalu tinggi dipasar internasional, supaya menjaga ini jangan terlalu berat lewat pemotongan biaya ekspor, kalau terlau rendah justru akan mendukung industri biodiesel karea demand biodiesel akan meningkatkan harga CPO dalam negeri apabila pasar internasional lesu. Saya mulai dari petani. Nilai tukar petani dari padi lah karena pakai beras iu yang jadi acuan.

Menurut kajian saya sekitar 600 lebih sedikit, itu harga yang tidak boleh turun. Kalau turun petani akan kehilangan semangat karena dia akan bandingkan dengan padi (tanaman lain yang lebh profitable), mereka juga gak mikir kalo semua nanam padi maka pas panen harga padi akan turun juga.

Kebijakan antara ucapan dengan aksi suka beda tergantung ngomong sama siapa

Karena di Indonesia, lahan sudah habis. Lahan dalam pengertian free dan tidak bermasalah sudah tidak ada lagi. Lahan perkebunan milik perusahaan cenderung sudah ok (Mungkin BUMN dan PBS), tapi yang punya masyarakat yang statusnya gak jelas. Yang punya perkebunan cenderung tidak bertambah yang punya rakyat nambah sedikit-sedikit 2 ha 3 ha.

Kalau biaya olah sebetulnya tidak terlalu significan. Yang signifikan adalah biaya CPO jika terlalu rendah pengusaha CPO lebih baik jual CPO saja (mungkin maksudnya conversion cost). Angka 125 untuk PBS yang punya PFAD dan stearin gak masalah tapi bagi pemain baru gak masuk.

(Lanjut lagi)

INL produksi maret 2018, kalau mau jual produk ini susah bisa bermasalah, harga pasarnya bisa dimainkan karena PFAD produk samping yang produk antara karena itu kalau kita masuk ke biodiesel maka ini akan prospek sekali sebetulnya. 125 saya dorong OK jalan kita, asal jangan dengan pertamina tapi BPDP itu.

Kalau untuk greendiesel 125 gak cukup paling 150. Supaya ada margin yang bikin orang tertarik. Greendiesel gak perlu ada mix. Para pemain besar juga gak akan berkutat di 125 gak dapet. Yang sedang bangun ini wilmar di gresik. Di gresik dia reklamasi pantai bangun ini.

Saya waktu dengan pertamina pun membahas masalah ini pertama muncul adalah NDA non disclosure agreement semua tandatangan baru kita bisa rapat. Hasil rapat tertutup kalau gak ada itu mereka gak mau rapat. Ada kemungkinan ada kebijakan politik yang mau mereka hindari berupa nama baik yang tercemar atau merasa tidak memiliki wewenang untuk bicara kalau gak dipecat.

Jadi yang ngomong pun harus dilevel tertentu dimana detil nya justru yang dibawah. Memang susah sekali. Saya berapa kali ke wilmar jalan-jalan dikasi makan tapi informasi gak dapet. Mereka semua sangat tertutup sekali. Kalo saya pikir kalau untuk masalah nasional kenapa gak dibuka.

Ini tidak ada konsideran apapun yang terkait dengan GHG emission reduction jadi hanya konsideran tambahan. Apa manfaatnya (biodiesel) cari-cari oh ini (GHG reduction) konsideran utama ya untuk masalah energy shortage (bisnis).

Sei mangke ini lahanya punya PTPN III BOT selama 25 tahun.

Yang jelas kebijakan biofuel ini wajib karena cadangan minyak sudah tinggal 11 tahun an lagi.

Malasyia bisa dapat mencapai 5 ton per hektar karena mereka dikendalikan oleh Velda semacam koperasi pengusaha rakyat dibidang sawit. Petani gak masuk ke GAPKI kalau VELDA khusus untuk rakyat.

Perusahaan biodiesel milik PTPN IV cuma beroperasi 1 tahun tapi sudah mati.

Terima kasih atas waktu Bapak untuk interview ini

Finish

Appendix Five

Sample of Interview (Government Stakeholder)

RUEN dibuat oleh pemerintah dan ditetapkan oleh pemerintah yaitu 8 kementerian yang tergabung dalam DEN. Peran pemerintah daerah ada juga dalam RUEN terutama untuk masalah renewable termasuk biofuel dan biomass.

Pedoman penyusunan RUEN ditetapkan oleh presiden (perpres), semua dibuat oleh pemerintah tapi dalam proses pembuatannya anggota DEN melihat ketikdasinkronan sehingga dirombaklah ceritanya. Perombakan itu membuat semua dibicarakan kembali dengan kementerian teknis.

Terkait biofuel dinyatakan didalam RUEN sampai tahun 2025 dibutuh kan 2 juta KL biofuel. Di tetapkan juga jenis tanamannya tapi yang tidak berkonflik dengan sisi pangan seperti singkong beracun (cassava) dan kemiri sunan (candlenut). Untuk menjaga agar terjaga ketersediaan feedstock maka direncanakan untuk membentuk BUMN khusus agar membeli hasil dari petani penanam tumbuhan feedstock tersebut. Agar kejadian jathropa tidak terulang kembali dimana petani sudah tanam tapi tidak ada yang mau beli hasilnya. Sehingga terkait rencana ini, petani sudah skeptis terlebih dahulu. Oleh karena itu muncul ide membentuk BUMN khusus tersebut.

Jadi yang paling siap sebagai feedstock adalah kelapa sawit, luas total kebun sekitar 12 juta. Untuk menjadi bahan bakar (biofuel) sawit tidak hanya mengandalkan CPO, melainkan juga bagian lain seperti TBS nya, batangnya, seratnya, kernelnya semua bisa digunakan sebagai bahan bakar untuk pembangkit listrik. Makanya pemerintah mengeluarkan permen 12 untuk mendorong itu.

Semua bagian sawit memiliki nilai jual sehingga dapat di ekspor dan ada pasarnya. Perusahaan sawit seperti PTPN III di Kalimantan sudah menggunakan limbah sawit sebagai bahan bakar untuk pembangkit listrik menggantikan batubara. PLN juga bersedia melakukan mix dalam bahan bakar untuk PLTUnya, jadi tidak 100 persen batubara.

Biofuel dilihat dari POME?

Terkait kebijakan B20, berdsarkan usulan Pokja BBN B20 (ketuanya dari Kementan dan dibentuk DEN bersama Aprobi). Saat itu di uji cobakan di Adaro kepada mesin kendaraan diesel (most likely truk) dan memang ada permasalahan berupa munculnya kerak (sludge) di mesin terutama setelah mencapai 20% mix. Sehingga setelah 20% sangat sulit untuk menambah porsi campuran jadi dapat dikatakan bahwa 20% merupakan campuran maksimum FAME tanpa menimbulkan dampak negative untuk mesin dalam jangka pendek. Sehingga dalam hal ini kebijakan B20 tidak semata untuk mengurangi konsumsi impor tetapi memajukan industry hilirisasi CPO dan biodiesel.

Pemerintah tidak pernah melakukan pengujian biodesel di lab. Uji tersebut biasanya dilakukan oleh perusahaan. Tes atau penelitian yang dilakukan pemerintah biasanya dilakukan secara individu oleh peneliti-pneliti tertentu dan tidak berskala nasional serta tidak ada penugasan secara khusus untuk meneliti B20 ini.

Kebijakan B20 ini merupakan kebijakan yang bottom up tapi dari para industrialis semua seperti industry otomotif, pabrik-parik dan aprobi, tak ada keterlibatan daerah. Sedangkan keterlibatan akademisi pun minim dimana riset-riset yang dilakukan akademisi bukanlah dedicated research unutk meneliti kebijakan B20 untuk kepentingan pemerintah melainkan sesuai dengan apa-apa saja yang mereka ingin lakukan (tujuannya lebih bersifat personal akademis di area-area tertentu).

Potensi bioenergy dari biofuel hanya dari sawit saja yang menentukan pun tidak jelas dari siapa karena data dari pemerintah tidak perlu disebut sumbernya. Sehingga dapat dikatakan sumbernya seperti anonim tidak diketahui siapa yang melakukan riset atau angkanya dari mana tapi sah dan legal karena dikeluarkan oleh pemerintah. Data-data terkait potensi sawit memang di komparasi dengan data dari pusat penelitian sawit tapi ketika terjadi perbedaan angka munculah angka-angka yang bersifat kompromistis.

Kebijakan B20 sendiri masih belum tercapai tujuan utamanya. Problem utama di infrastruktur, dalam hal ini biosolar sulit didapat oleh masyarakat karena memang tidak tersedia di SPBU hanya yang tertentu saja. Walaupun regulasi sudah mewajibkan untuk menyediakan dispenser untuk biosolar tapi banyak yang tidak patuh. Penerapan kebijakan juga problem, yang dijawa aja tidak patuh gimana yang diluar jawa. Kalau Cuma masalah mewajibkan bisa dibuat tapi problem utama adalah ketersediaan supply, jangan sampai sudah diwajibkan dan pemilik SPBU patuh dan menyediakan dispenser untuk biosolar tapi supply tidak tersedia terutama ketika harga di ekspor harga bagus maka menjadi masalah ketersediaan supply.

Implementasi kebijakan lemah selain dari infrastruktur yang belum memadai. Produsen biofuel memproduksi biofuel tapi hasilnya produksinya di ekspor karena tidak terserap pasar domestic. Perusahaan mobil Toyota memproduksi mobil di DN yang spek mesinnya dibuat khusus supaya bisa menggunakan biofuel tanpa masalah, tapi mobil tersebut tidak dijual di pasar domestic melainkan di ekspor ke Argentina dan Brazil karena Indonesia belum siap dengan infrastruktur biofuelnya.

Investor baru yang ingin memproduksi biofuel dari bahan lain selain sawit selalu terbentur dengan masalah perijinan lahan.

Pricing policy juga jadi masalah karena harga ke konsumen diseragamkan padahal ongkos produksi dan kualitas berbeda. Biodiesel pada dasarnya memiliki kualitas lebih baik karena rendah sulfur daripda bahan bakar fosil. Tapi penyeragaman harga terutama dengan bahan bakar fosil menyebabkan produksi biofuel menjadi lebih mahal dengan profit yang sedikit (bahkan pas-pasan) karena semakin rendah harga ICP maka harga diesel makin rendah, sedangkan harga biofuel tergantung dengan harga CPO yang cenderung menguat, sehingga jika besaran subsidi untuk fosil fuel tetap tapi untuk biofuel semakin tinggi.

Kemudian harus ada kebijakan untuk penggunaan/pemanfaatan biofuel. Kenapa dari CPO dulu, karena bahan baku sawitnya sudah tersedia, lahannya sudah ada, production chain sudah matang sehingga atur dulu saja yang lebih mudah.

Terkait daerah, terjadi perubahan kebijakan dimana sebelumnya pusat yang lebih berperan saat ini daerah juga ikut bertanggung jawab akan permasalahan energy di wilayahnya masing-masing. Jika sebelumnya apabila ada masalah seperti kelangkaan BBM, maka kepala daerah complain ke pertamina maka dengan adanya perpres baru kondisinya dibalik. Sehingga dalam hal ini peran daerah semakin diperkuat termasuk juga dalam peran untuk menanggung subsidi energy.

Tapi peran utama daerah saat ini adalah dalam penyediaan lahan. Daerah mendapat tugas untuk menyediakan lahan terutama lahan untuk fasilitas pembangkit atau gardu distributor listrik. Tapi rekaman tidak menunjukan apakah kebijakan ini telah benar-benar dilaksanakan di level daerah, kalau di terima oleh pimpinannya iya.

Permasalahan di Biodiesel lebih kearah kelapa sawitnya tapi tidak terlalu parah karena perkebunannya sudah matang sudah ada disana, pembeli untuk produknya juga sudah ada jadi kelapa sawitnya pasti ada. Permasalah lahan muncul ketika biofuel tersebut bukan berasal dari kelapa sawit, karena lahan tersebut harus dikuasai juga oleh industry biofuel nya. Tapi industry pun mengalami kesulitan karena lahan untuk menanam feedstock biofuel non sawit itu terpencar-pencar tidak bisa dalam satu lokasi. Lahannya pun pada dasarnya tidak dimiliki tapi disewa sehingga muncul kesulitan untuk mendapatkan satu lahan yang besar karena adanya kompetisi lahan dimana pemilik lahan juga menentukan produk apa yang ketika ditanam akan menghasilkan keuntungan besar. Dalam hal ini penanaman feedstock untuk biofuel non sawit selalu menjadi opsi terakhir untuk di tanam.

Untuk expansi lahan pun sangat sulit karena ada permasalahan RTRW. Kalau di undang-undang setiap ada usulan baru untuk RTRW dibutuhkan waktu bisa sampai 5 tahun karena aturan terkait RTRW direvisi per 5 tahun. Hal ini menyebabkan investasi untuk lahan untuk biofuel menjadi terhambat, karena keputusan yang dibuat cepat justru dapat menyebabkan kepala daerahnya di kriminalisasi karena melanggar UU RTRW.

Salah satu solusi adalah dengan menerbitkan perpu (govt regulation in lieu of law) tapi perpu hanya bisa dikeluarkan apabila ada hal yang genting dan dalam konteks lahan untuk biofuel feedstock hal ini tidak dapat dijadikan argument yang kuat. Kurangnya argument untuk membuat perpu menyebabkan hanya 4 juta ha lahan yang bisa dipersiapkan khusus untuk biofuel feedstock.

4 juta lahan yang dapat dianggap sebagai area untuk biofuel feedstock dibuat dengan menggunakan citra satelit. Tapi ada permasalahan lain yaitu daerah yang

bersangkutan tempat lahan tersebut berada tidak dilibatkan dalam pembentukan peta peruntakan lahan tersebut. Akibatnya terjadi perbedaan signifikan dari citra yang diciptakan oleh peta (yang difoto dari satelit) dengan kondisi sesungguhnya dilapangan. Hal ini menyebabkan area yang dicitrakan sebagai lahan potensial untuk biofuel feedstock sebenarnya bukan lahan yang kosong/marginal melainkan sebuah desa atau bahkan wilayah perairan bahkan untuk daerah tertentu peta tersebut menangkap wilayah yang bukan wilayah RI. Hal ini terjadi karena satelit dapat menangkap gambar yang merupakan area yang bukan hutan tetapi pembacaan citra satelit tersebut masih dilakukan secara manual dengan menggunakan spidol sebagai penanda area.

Hal ini menjadi ironi karena pemda tidak memiliki kemampuan untuk melakukan pemetaan wilayahnya sendiri sehingga mereka hanya bergantung kepada pusat, tapi pusat pun hanya bisa melakukan pencitraan melalui satelit tanpa mengetahui apakah image yang dibuat sudah akurat sesuai dengan yang dicitrakan atau tidak.

Masalah lain adalah munculnya perkampungan liar dimana orang lebih memilih areal yang kosong untuk mendirikan tempat tinggal tanpa memandang status kepemilikan hal ini bukan hanya dilakukan oleh suku-suku yang tinggal dipedalaman tetapi juga oleh masyarakat baik yang tinggal di perkotaan maupun pedesaan. Para peminpin daerah juga tidak bisa melakukan penertiban atas perkampungan liar tersebut karena pada dasarnya mereka juga merupakan basis pemilih sang kepala daerah pada saat pilkada.

Leadership commitment adalah permasalahan utama yaitu kemampuan para pemimpin untuk tidak kompromi kepada para pemilihnya sendiri untuk menegakan aturan yang dibuat demi kepentingan umum.

Politik istana juga merupakan masalah pelik bagi sector energy karena walaupun sudah terjadi kesepakatan baik dari kementerian terkait maupun stakeholder terkait kebijakan energy, aturannya bisa tetap terhambat untuk disetujui presiden karena pihak-pihak yang berkepentingan akan berusaha meloby presiden melalui berbagai jalur untuk menghambat di tandatanganinya kebijakan terkait energy.

Biofuel tidak digunakan untuk pembangkit listrik oleh PLN tetapi BBN (biomass) banyak digunakan oleh perkebunan sawit untuk pembangkit listrik.

Pertamina masuk ke industry biofuel tapi hanya sebagai pilot project menanam rumput gajah untuk feedstock yang pada akhirnya akan di ekspor karena pasar ekspor lebih tinggi harganya daripada pasar domestic, dimana fossil fuel juga disubsidi dan turunnya harga minyak juga memperparah situasi.

Pricing policy biofuel sangat menentukan, di Thailand di tetapkan harga dari tebu dan cassava (feedstock biofuel) sehingga petani mendapat insentif untuk menanam tanaman tersebut di tambah lagi dengan benih yang gratis dari pemerintah kemudian di SPBU ada berbagai pilihan campuran biofuel dengan berbagai jenis harga. Selain itu di dalam negeri juga ada kendala yang diakibatkan di subsidinya fossil fuel terutama jika biofuel malah dioplos dengan fosil fuel yang di subsidi yang mana hal ini illegal untuk dilakukan.

Kontribusi energy terhadap emisi karbon adalah 40% sehingga salah satu upaya untuk mengurangi emisi karbon adalah dengan memperbanyak porsi EBT. Yang menjadi masalah adalah inkonsisten di dari regulasi di mana pemerintah ingin mendorong penggunaan EBT tapi regulasi yang dikeluarkan justru sebaliknya.

Untuk pengembangan biofuel sendiri lebih terkonsentrasi pada biomass untuk pembangkit listrik sedangkan biofuel untuk sector transportasi masih belum berkembang.

Ide dasarnya kebijakan biofuel ini dilaksanakan adalah untuk mengurangi volume impor BBM. Biofuel ini diperoleh tanaman tertentu yang banyak jumlahnya di Indonesia. Ketersediaan feedstock nya lebih mudah, yang kurang pricing policy. Sedangkan emisi pengurangan karbonnya sendiri di hitung berdasarkan jumlah pengurangan konsumsi BBM fosil (suatu hal yang aneh karena tidak memperhitungkan LCA dari biofuel). Konsumen BBM paling besar adalah sector industry kemudian transportasi dan terkahir household sehingga diarahkan supaya feedstock biofuel diperuntukan untuk industry agar konsumsi BBM fosilnya berkurang.

Ada indikasi bahwa mengoptimalkan peranan EBT mendapat halangan dari bisnis migas. Para ‘mafia’ migas ini memiliki kepentingan terhadap bisnis migas dimana konsumsi BBM kita sekitar 1.5 juta barel per hari sedangkan kapasitas produksi adalah 800 ribu barel sehingga sisanya harus di impor. Jika 20% dari konsumsi BBM dipenuhi oleh EBT maka import BBM justru berkurang dan ini akan mengganggu elit tertentu yang berkepentingan dengan urusan import BBM.

Terkait keberadaan ‘mafia’ migas, sulit untuk menemukan siapa mereka. Sebab disetiap pemerintahan mereka selalu ada. Para oknum ini selalu bersiap-siap untuk bermain di semua kaki manakala terjadi pemilu presiden, sehingga siapapun yang memimpin eksistensi mereka akan tetap dipertahankan oleh oknum-oknum yang pada akhirnya duduk kembali di pemerintahan.

Dalam penandatangan RUEN sendiri juga sulit, karena ada inkonsistensi dengan statement presiden, di mana awalnya presiden mengatakan supaya semua menteri di DEN focus untuk menyelesaikan RUEN tapi ketika disodori draft RUEN presiden menjadi ragu dan meminta supaya di kaji lagi angka-angkanya, seakan presiden tidak percaya dengan angka-angka yang diformulasikan oleh anggota DEN. Walaupun pada akhirnya di tandatangani presiden tetapi memang ada proses yang sulit untuk bisa di tandatangani presiden dan sebagian besar disebabkan oleh adanya factor sang pembisik yang tidak ketahuan siapa pelakunya.

Sehingga yang diperlukan adalah leadership commitment supaya ada komitmen dari pemimpin baik pusat dan daerah supaya tetap pada komitment mereka semula untuk mengembangkan biofuel.

Terkait dengan desentralisasi, seorang kepala daerah bisa menolak perintah dari presiden dengan alasan mereka dipilih oleh rakyat di daerahnya sehingga walapun presiden dalam hirarki lebih tinggi dari gubernur tetapi keduanya dipilih oleh rakyat sehingga seorang gubernur bisa mengatakan bahwa dia mendapatkan legitimasi dari rakyat yang memilihnya bahwa perihal yang diputuskan oleh presiden tidak diterima oleh rakyat di daerah si gubernur. Hal ini terjadi ketika kasus geothermal dimana pada saat hearing dengan semua stakeholder untuk menentukan harga jual listrik satu orang gubernur tidak setuju dan ketika di panggil presiden kenapa tidak setuju alasan itu yang mengemuka. Hal ini yang membuat investor bingung dan memberi ketidak pastian pada mereka.

Bahlan di DEN sendiri ketika ada rapat-rapat di DEN untuk rapat anggota dimana yang hadir dari pemerintah adalah eselon 1 dimana mereka seharusnya menjadi representasi dari suara menteri tapi ketika di forum sidang anggota semua keputusan berubah yang tadinya sudah setuju berubah jadi kebalikannya. Sehingga keputusan yang terjadi pun mentah kembali dan harus kompromi lagi begitupun ketika rapat paripurna dengan presiden.

Daerah sendiripun apabila tidak mampu mengerjakan RUED cenderung menggunakan tenaga konsultan sehingga masih belum jelas apakah eksekutif yang menandatangani paham atau tidak isinya. Dalam hal ini DEN memberikan bimbingan teknis kepada daerah termasuk membuat model dan lain-lain.

Dalam hal ini pak syamsir mengatakan seharusnya Bapeda yang mengusuri urusan EBT termasuk biofuel karena ini merupakan lintas sector tapi justru di daerah mereka justru menganggap sector EBT adalah urusan dinas energy sehingga lead nya tetap lah dinas energy.

Kebijakan energy seharusnya merupakan kebijakan yang bottom up, dimana daerah yang seharusnya lebih tahu potensi energy mereka. Tapi kenyataanya daerah selalu menunggu pusat untuk mengetahui potensi apa yang mereka miliki dan dari situ menjadi dasar untuk membuat regulasi. Sehingga SDM di daerah juga menjadi masalah yang serius terutama pada saat memformulasikan kebijakan energy di daerah.

R&D juga harus difokuskan untuk mengembangkan EBT seperti halnya di LN kayak Jepang dan Korea Selatan.

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Finish.

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