

# The Transformation of Agriculture Based Economy to an Industrial Sector through Crowd Sourcing In Malaysia

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**Abstract:** This paper proposes the concept of transformation an agriculture-based economy to an industrial sector thru crowd sourcing. Malaysia play vital role in change an agriculture-based economy to industries. Other Malaysia's regional neighbors such as Thailand, Indonesia, Vietnam while still need improvements in many development sectors but focus of this paper to depict value between Malaysia based on the deployment of the (a) Quadruple Helix Model (QHM) is an improvement on the "Triple Helix Model", which popularized the interaction between industry, academia and government. . (b) Whole of Government (WOG) has to facilitate and foster the adoption of these formidable constructs so that innovation can flourish in Malaysia. (c) Network of Mosque (NOM) is focused on creating opportunities to poor and extreme poor on ways to increase their income and break away from the poverty by the small business enterprise such as Azam kerja, Azam Niaga, and Azam Tani. Crowd sourcing plays the important role to support the improving of agriculture by ICT as a tool of one solution to rise the agricultural activity for instance by using mobile, wireless and internet industries like the farmers can prepare for weather related to events, internet function to store large amount of data, mobile phones to disseminate temperature information to remote farmers cheaply especially to prevent crop losses and mitigate effect from natural adversities.

**Keywords:** Network of Mosque (NOM), Whole of Government (WOG), Quadruple Helix Model (QHM), Transformation, Agriculture, Industrial, Economy.

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## 1. INTRODUCTION

Malaysia is obtained her independent 57 years ago and agriculture has contributed substantially to its gross domestic product. The focus of agricultural before the year 1970s, the Malaysian economy was mainly agriculture-based. The sector contributed close to 50% of the country's GDP back in the 1950s but its importance had been reduced to below 10% by 2009. Apart from industrial crops such as oil palm and rubber, the agriculture sector added RM20.2 billion or about 4% of Malaysia's gross domestic income (GNI) in 2009 with a compound annual growth rate of 10.7%. However, the global requirement for agriculture is expected to expand fast with growing population and rising prosperity, and there are still many riches to be made in the agriculture sector given Malaysia's abundant natural resources. It is predictable that between 2010 and 2015, global food stipulate will increase by 10% while production will increase by a mere 1.6%. Next, the government agencies more concern on the food crops while the private agencies focus mainly on the plantation crops. Based on statistics, agriculture industry generates just about 12 percent to the national gross domestic product (GDP) and its reducing unemployment rate in Malaysia. The history of agriculture can be traced back to during British administration in Malaya. The commercial part in agriculture crops such as palm oil, cocoa and rubber were introduced. Hence, these crops became the vital part in agricultural exports to global market. Nonetheless, the agriculture in Malaysia also facing for some challenges like the country's agriculture trade deficit has been increasing. At the same time Malaysia's agriculture has many benefits from the growing demand for food product and the performance of the country's agro-food sector lags that of neighboring countries. For example, Malaysia's average yield per hectare for paddy or rice production is only 3.7 tonnes, compared with 4.9 tonnes in Vietnam and 4.7 tonnes in Indonesia. While Thailand's yield of 2.7 tons

per hectare is below Malaysia. According to the Performance Management and Delivery Unit (PEMANDU), the condition of food factor must be in good control; Malaysia will fail to capture market opportunities and will have to continue increasing its food imports amid rising food prices. The alternative to solve this solution is to address the issue of lack of economies of scale and market centricity, and to focus on high-value products in order to affect a transformation in the industry. Not only that, the role of ICT in agriculture is very essential to facilitate local and global agriculture surveillance with various useful functions such as its help faster contact with consumer and providers, up to date information which related to agriculture data. In addition, it can bring farmers closer to retailers and international markets where a crowdsourcing as a platform to give positive info about how to enhance the quality of agriculture product by individual or groups for idea generation in the hope of accelerating the implementation of ideas while fostering social innovation and collaboration among Malaysian citizens The Agriculture National Key Economic Area (NKEA) plays to double the agriculture sector's GNI contribution to RM49.1 billion by 2020, through 16 Entry Point Projects (EPPs) and business opportunities. This achievement will involve capturing a higher value for Malaysia's produce and increasing productivity.

## 2. PROJECT BACKGROUND

The agricultural economists focused on how agriculture can contribute to the whole economic growth and modernization. It is believed that the robust agricultural growth and productivity are vital aspect to sustained economic development. There are several policy makers, policy analyst and academic in developing countries. However, the interest in agriculture is returned and manifested in Malaysia where it is heralded as the next (third) engine of growth and promoted as 'New Agriculture' in Malaysia's latest 5-year development plan – the Ninth Malaysia Plan. The agriculture sector especially more concern to palm oil and rubber as the important factor to support longtime major contributors to GNI and plans are underway to boost the sector's value to Malaysia's economy. It plays an important role in Malaysia's economic development – providing rural employment, uplifting rural incomes and ensuring national food security. According to Tan Sri Bernard Dompok ( Minister of Plantation Industries and Commodities), he said that From the first oil palm cultivation in the early part of this century, the palm oil industry has transformed to become Malaysia's key socioeconomic driver, eradicating poverty and providing direct employment to more than 610,000 people, including over 177,000 smallholders. Based on plan to make palm oil as a major growth engine, the sector needs to undergo various fundamental shifts along its supply chain, from increasing the productivity of smallholders to growing capacity expansion of the downstream sector. The oil palm areas under development have risen to well over five million ha of planted land; nevertheless areas with ageing oil palm trees profile have hindered production growth and the country's average productivity. Average annual yield of oil palm fresh fruit (FFB) remained relatively stagnant at 20 tones/ha per year. Therefore, the Palm Oil National Key Economic Area (NKEA) was suggesting Eight Entry Point Projects (EPPs) to driving the sector's growth and its role as a central element of the national economy. Eight Entry Point Projects (EPPs) were identified under the Palm Oil National Key Economic Area (NKEA) to drive the sector's growth and its role as a central element of the national economy which are separated into two strategic measures. The first aims to make certain sustainability and achieve the country's oil palm FFB yield by 2020. Next, the second aim factor to support agriculture to boost income nation for Malaysia from rubber. It is the second largest industry in the world after iron and steel. The need of rubber has risen exponentially based on the increasing of the tyre and automobile industries. To enhance rubber yield in Malaysia, the EPP aims to make sure high-yielding and quality-planting material are supplied to the small holders. The EPP is projected to produce an incremental GNI of RM 3.1 billion by 2020 and 31,000 jobs. Consequently, Malaysian Rubber Budwood Centre (MRBC) was established to supply adequate quantity of high quality bud-eyes to nurseries to produce planting materials of the recommended clones. The MRBCs is divided in two such as in Bukit Kuantan, Pahang, and Penampang, Sabah, with an area of 30 ha and 15 ha respectively were successfully completed in 2012. Regarding to the performance of Malaysia's rubber plantation which is decreased over the last 10 years as a rubber land then converted to accommodate to crops and several economic activities. In 2000, the area under rubber stood at 1.43 million ha but has reduced to 1.02 million ha in 2011. Therefore, the policies have been formulated to guarantee that the rubbers areas are maintained at 1.2 million ha, of which one million ha are tappable. The Government wants to implement the replanting of rubber from some agencies for instance RISDA, LIGS, JPS, FELDA and FELCRA are committed to make certain replanting and new planting activities between smallholders. In 2011, the replanting grant was improved from RM7, 000 to RM9, 230/ha in Peninsular Malaysia and it was extended to Sarawak and Sabah at the rate of RM13, 500/ha and RM14, 000/ha respectively.

### 3. PROJECT OBJECTIVE

The main focus of this paper is to propose the transformation of an agriculture based economy to an industrial sector through crowdsourcing in Malaysia. This system shall blend and leverage on the strength of three key concept, namely: (a) Quadruple Helix Model (QHM), a country economic lies on four actors namely: academia, industry, government, and citizen, and economic growth are generated by New Economic Model (NEM) to transform the nation into a high income with suitable and inclusive in order to achieve developed nation status by 2020; (b) “Whole of Government” (WoG) concept to transform the government to be more effective in any delivery services as well as accountable for outcomes by National Key Result Areas (NKRAs); (c) Network of Mosque (NoM) focused on ICT as a tool of one solution to rise the agricultural activity by using mobile, wireless and internet industries which the internet function plays to store large amount of data, mobile phones to disseminate temperature information to remote farmers cheaply especially to prevent crop losses and mitigate effect from natural adversities. This paper more emphasize to palm oil and rubber as an important element to boost the country income. The Government commitment to aid the downstream palm oil sector is discontinued a duty-free export quota of crude palm oil and reduced crude palm oil export taxes beginning 1 January 2013. The four Entry Point Project (EPP) is implemented under NKEA like maintaining the production area of one million ha and increasing the average yield. The Palm Oil and Rubber NKEA highlights that the country’s key agricultural commodities are crucial for the country’s positioned in the future where Malaysia will be at the forefront to meet growing demand for the two key commodities as global population increases and rising affluence in emerging countries boosts purchasing power. By the year 2020, Malaysia’s palm oil sector is targeted to enhance the country’s total Gross National Income (GNI) by RM 124 billion to RM 178 billion and create 41,600 new jobs. To explain the performance of palm oil statistic will exhibited below;

Key statistics	2010	2011	2012
Planted area	4.8 million ha	5.0 million ha	5.1 million ha
CPO Production	16.99 million tonnes	18.91 million tonnes	18.79 million tonnes
Exports of palm oil	16.66 million tonnes	17.99 million tonnes	17.58 million tonnes
Exports of palm oil and products	23.04 million tonnes	24.27 million tonnes	24.59 million tonnes

(Tan Sri Bernard Dompok, 2012)

To achieve this target, the Eight Entry Point Projects (EPPs) were identified under the Palm Oil National Key Economic Area (NKEA) to drive the sector’s growth and its role as a central element of the national economy which are separated into two strategic measures. The first aims to ensure sustainability which helps the country’s oil palm FFB yield by 2020. Five EPPs are clustered such as [1] EPP 1 for accelerating the replanting and new planting of oil palm. [2] EPP 2 for Improving fresh fruit bunch yield, [3] EPP 3 for Improving workers’ productivity, [4] EPP 4 for Increasing the oil extraction rate, [5] EPP 5 for Developing biogas facilities at oil palm mills. Next, the second measure aims to maximise integration along the value chain with the goal of developing higher valued industry based on crude palm oil production and refining. Three EPPs come under this goal such as [1] EPP 6 for focusing on high value oleo derivatives, EPP 7 for commercializing second-generation bio-fuels EPP 8 for expediting growth in food and health-based downstream segments. In addition, the rubber industry in Malaysia is the second largest industry in the world. To boost the rubber yield, the EPP aims to ensure only high –yielding and quality-planting material are supplied to smallholders. This EPP is implemented to produce an incremental GNI of RM 3.1 billion by 2020 and 31, 000 jobs.

- **Seeds Production Areas (SPA):**

Rubber seeds are necessary to produce root stocks which are then budded to create planting resources of identified clones. SPA was established by Malaysian Rubber Board (MRB) to contribute extra rubber seeds for the reparation of the root stocks by nurseries.

- **i-KLON and RITeS:**

i-Klon is introduced as value to the current process of clone screening carried out manually, as well as to accelerate the certification process for nurseries. For the same function, a subjective mechanism, known as Rubber Information and Traceability System (RITeS), was developed to monitor and track the sources of planting materials.

- **Good Agricultural Practices (GAP):**

RISDA and LIGS (Lembaga Industri Getah Sabah) were active in conducting trainings related to Good Agricultural Practices (GAP) to ensure the young rubber trees are given the right inputs. As at Oct 31, 2012, a total of 111,727 smallholders in Peninsular Malaysia have been trained by RISDA while LIGS has provided training to 512 smallholders in Sabah.

- **Business Opportunities:**

The most important thing of palm oil is one of a significant global commodity. When the tree is planted, it can produce oil palm fruit for more than 25 years; provide a main source of income and employment for rural communities. Its oil is highly profitable, as the plant yields more oil/ha than any other major oilseeds. Regarding to its resourcefulness — the oil finds its way into toothpaste, soaps to chocolates and the clean fuel that powers automobiles — palm oil is poised for most important growth in the decades ahead. The BOs aim as a key challenges to the industry which consist of rising mechanization to reduce the plantation industry's dependence on labour in order to raise yields. Malaysia's palm oil industry is expected to grow in the next decade, powered by three Business Opportunities (BOs) in upstream expansion, development of existing downstream palm oil activities as well as biodiesel production worth RM57.6 billion by 2020.

#### 4. LITERATURE REVIEW

- In 1970, the Malaysian economy was mostly agriculture-based. The sector contributed close to 50% of the country's GDP back in the 1950s but it's had been reduced to below 10% by 2009. However, industrial crops such as oil palm and rubber in the agriculture sector contributed RM20.2 billion or about 4% of Malaysia's gross domestic income (GNI) in 2009 with a compound annual growth rate of 10.7%. Nevertheless, the international agriculture is expected to expand speedily with growing population and growing affluence, and there are still many riches to be made in the agriculture sector in Malaysia. (Sue-Ann, 2012).
- In 2013/2014 productivity report described the agriculture sector is going through a period of change as traditional farming practices give way to modern agricultural techniques and small holders consolidate their operations to gain greater economies of scale. Productivity growth in the agriculture sector improved to -3.5% compared to -11.1% in 2012, with productivity rising to RM33,006 from RM34,202, this sector comprises various sub-sectors including oil palm, rubber, livestock, forestry and logging, fisheries, aquaculture and other agriculture (paddy, fruits, vegetables, coconut, tobacco, tea, flowers, pepper, cocoa and pineapple). It contributed RM55.9 billion to Malaysia's GDP in 2013 (7.1% of total GDP), up from RM54.8 billion in 2012. The sector employs about 1.7 million workers, representing 13% of the country's total work force. The boost in productivity growth was made possible by a significant increase in the output of crude palm oil (CPO) and food commodities. The oil palm subsector was the single largest contributor to the sector's growth, accounting for 36.7% of the sector's Total added value. The food segment contributed about 46.2% to total added value, with significant increases in the production of livestock, fisheries, fruits and vegetables. (Joy Lee, 2011).
- Information and communication have always crucial in agriculture. It can contribute the smart agriculture and incentive farmers for instance ICT might improve the agriculture productivity such as how to answer the abundant information needs from farmers. ICT is one of the solutions which have the incredible potential to improve agriculture in developing countries specifically. The ability of ICTs to bring momentum in agriculture more compelling in rising investment in agricultural research. ICT is any device, tools, or application that permits the exchange or collection of data through interaction and transmission. (Book, 2011).

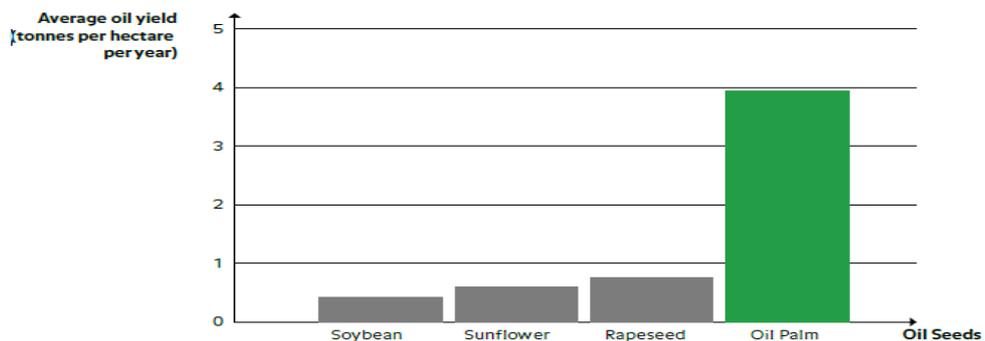
#### 5. PROPOSED SOLUTION

In order to realize this goal, the Quadruple Helix Model (QHM) which emphasize to New Economic Model (NEM) as represented to approach on the Tenth Malaysia Plan based on the performance of palm oil and rubber productivity to support Malaysia to achieve the target by the year 2020. Palm oil target is for the industry to boost output to GDP to RM

21.9 billion. To accomplish this, key initiatives include promoting Malaysia as a global hub for palm oil and preferred destination for foreign investments. Palm oil industrial clusters would be developed into integrated sites to promote downstream activities such as bio-fuel, oleo chemicals and etc. The government also plans to centralize the procurement of agricultural inputs such as fertilizer and pesticides to lower input costs for small holders. Regarding to the ETP, the palm oil industry is predicted to grow by 7.1% over the next 10 years, driven by gains in the fresh fruit bunch (FFB) yield and oil extraction rate (OER), new plantation expansion abroad and ventures further downstream. The enhance in the palm oil sector's GNI will be achieved through eight entry point projects (EPPs) spanning the palm oil value chain in order to capture the world's growing demand for the vegetable oil. Global demand for palm oil registered an annual growth rate of 10% between 2000 and 2009. Then palm oil fact such as [1] palm oil is the most efficient oilseed crop in the world, [2] one hectare of palm oil plantation is able to produce up to ten times more oil than other leading oilseed crops ( Refer to figure 1), [3] among the 10 major oilseed, palm oil accounted for 5.5 % of global land use for cultivation, but produced 32% of global oils and fats output in 2012 ( refer to figure 2 and 3), [4] Indonesia and Malaysia produce about 85 % of the world's palm oil.

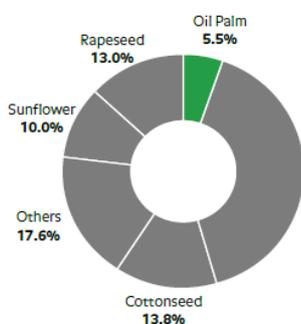


Other producer countries include Thailand, Columbia, Nigeria, Papua New Guinea and Ecuador.

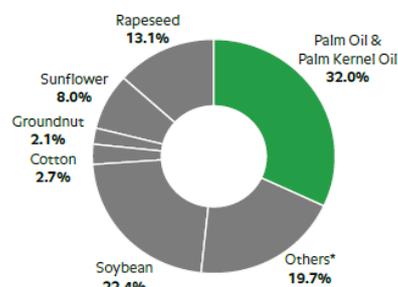


**Figure 1**  
Oil Palm Efficiency vs Other Major Oil Crops  
(Source: Oil World 2013)

(Plantation S. D., 2014)



**Figure 2**  
10 Major Oilseeds : Area in 2012 (Total -258.9 mil hectares)  
(Source: Oil World 2013)



**Figure 3**  
17 Major Oils & Fats : Global Production in 2012 (Total -186.4 mil tonnes)  
\*Includes oils and fats such as butter, lard, fish oil, tallow and grease  
(Source: Oil World 2013)

(Plantation S. D., 2013)

## RUBBER:



(Dompok, p. 111)

The Government implements the replanting program activities among smallholders through RISDA, LIGS, FELDA, and FELCRA. In the year 2011, the replanting grant was improved from RM 7, 000 to RM 9,230/ha in Peninsular Malaysia then continued in Sarawak and Sabah at rate of RM 13, 500 /ha and 14, 000 per ha respectively. This activity which introduced by Government received an overwhelming response from smallholders and the aim of EPP is for replanting and new planting of 47,000 ha in 2013. In EPP 9, the contribution of rubber productivity is the important factor to boost the country income which rubber industry is the second largest industry in the world. Therefore, it is one of the solutions for Malaysia to improve the quality of rubber by the program of replanting of rubber in order to achieve the vision 2020.

The replanting and new planting programmes in 2012 witnessed a majority of the replanting taking place in Peninsular Malaysia, whereas new planting mainly took place in Sabah and Sarawak. The total planting of rubber to date was recorded at 28,576.98 ha, which is approximately 82 per cent of the targeted hectare of 35,000 ha for the year 2012. Another 16,508.07 ha of land are still at the work-in-progress (WIP) stage.

### **The Sustainability of the Upstream:**

#### ***Rubber Industry:***

In 2000, the position of rubber industry stood at 1.43 million ha then has reduced to 1.02 million ha in 2011 from the recognition for the vital of upstream sector in providing sufficient raw materials to the downstream industry in the future. Based on this condition, the policies have been formulated to certify the rubber areas are still in maintained at 1.2 million ha, of which one million ha are trappable. Assuming an efficiency of two tonnes/ha/year which a country targeted to produce two million tonnes of rubber for the year 2020 in order to support the development of the downstream activities. There are some effort from government to sustain the programme of replanting and new planting among smallholders by various agencies such as RISDA, FELDA, and LIGS. These programs have been help to increase from RM 7, 000 to RM 9, 230/ha especially in Peninsular of Malaysia and it has been continued to Sarawak and Sabah at the rate of RM 13, 500 and RM 14, 000/ha separately. Next, the achievement and challenges from those programme for instance inadequate supply of planting materials, weather and administrative process. However, the total planting of rubber was recorded at 28,576.98 ha which is similar to 82% of the target hectare of 35, 000 ha for the year 2012.

### **The Contribution of Rubber and Palm oil Industry for Malaysia:**

The importance of rubber and palm oil plantation for Malaysia is very huge to enhance for the income nation. For example, from rubber product will produce many types of invention such as tires, tires and tire-related and industrial which similar to general rubber products. In other words, Latex products like rubber cloves, catheters, latex thread and foam products. Next, the Malaysian Export especially for the latex product is accounted until 80 % which is mostly contributed by gloves. It is important to note that to enhance the efficiency or to overcome the shortage of workers, the industry must be considered embarking on automation. To explain, the supply of materials is one of the crucial factors to acquire the competitive edge to maintain as a country's producer and will continue to sustain itself as a vital revenue and

employment creator for the country. Therefore, the target to boost the natural rubber glove industry into global market from 62 % in 2011 to 65 % by 2020 with rising at 13 % per year and it is also projected for incremental GNI of RM20.8 billion and create 29,000 jobs.

Palm oil is a second major global commodity for Malaysia income. For example, biomass is considered to contribute for the country's income such as organic fertilizer which is the most important role to ensure the sustainability of fresh fruit bunch (FBB) yields. Next, the oil palm biomass is produced as by product of the palm oil industry for instance oil palm fronds, oil palm.

### Rise World Market of Latex:

#### Gloves to 65 % by 2020

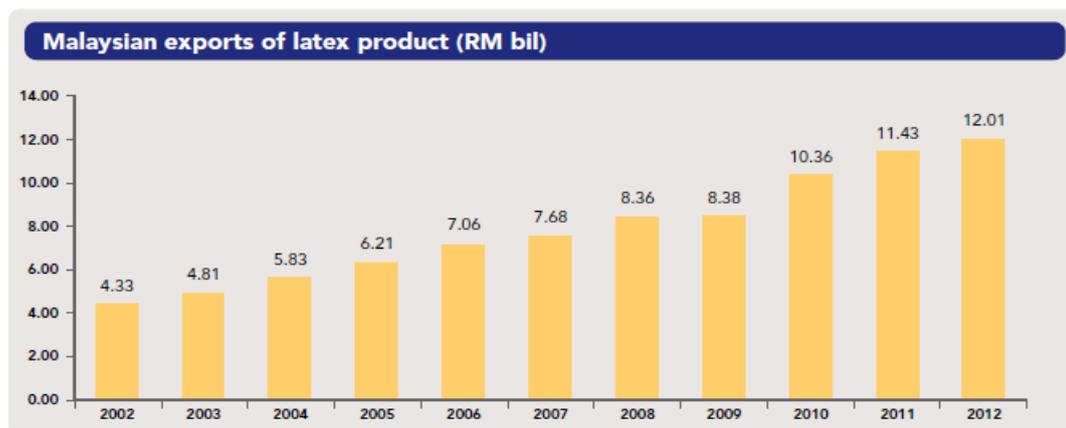


Exhibit 5.13: Malaysian Exports of Latex Products (RM billion)

(Tan Sri Bernard Dompok, 2012)

Palm oil is a second major global commodity for Malaysia income. For example, biomass is considered to contribute for the country's income such as organic fertilizer which is the most important role to ensure the sustainability of fresh fruit bunch (FBB) yields. Next, the oil palm biomass is produced as by product of the palm oil industry for instance oil palm fronds, oil palm trunks, empty fruit bunches, palm kernel shells, mesocarp fiber and palm oil mill effluent. In addition, the biomass demand for pellet in the market also is in higher expectation from some countries like from European energy utility companies which need it as a European renewable energy targets and Japan is sourcing biomass for co-firing in order to ensure for the sufficient energy supply given in reduction in nuclear energy capacity. Therefore, biomass is very essential to achieve the Malaysia Target by 2020 which can create about RM 9-10 billion in GNI and about 5,500 and 6,800 for direct and indirect jobs respectively. To explain, the target only can achieve by mobilizing 10 million tonnes of biomass for pellets and the capital investment is mostly expected during 3-5 years only depending on the changes in the pellet prices. Not only that, befouls also as one of biomass product such as bioethanol, bioethanol. In the market, it is blending Malaysia of 10 % for domestic demand; it's about 1 million tonnes of bioethanol plants across Peninsular in Malaysia. It's mean from this product will encourage most of jobs for the workers which is one of the benefit can help the country to open the opportunities to them to improve the incomes. As a result, biomass can give many benefits to the Malaysia which about RM 30 billion contributions to GNI by utilizing the biomass from the oil palm industry for higher value-added downstream activities. It helps to provide jobs for Malaysian as well as producing a high value product out of resources for industries in Malaysia.

## 6. CONCLUSION

Plantation agriculture is a backbone for the Malaysian economy since the turn of the 20th century. It is very clear that, from agricultural sectors might contribute high income for the country and help for people to improve their life. The plantation from rubber and palm oil is a big majority contribution in order to achieve the target by the year 2020 which the aim to enhance the industry's GNI from RM 52.7 billion to RM 178.0 billion and The effort from Government which emphasize to New Economic Model (NEM) as represented to approach on the Tenth Malaysia Plan based on the performance of palm oil and rubber productivity to support Malaysia to achieve the target by the year 2020.

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