SOCIOECONOMIC DETERMINANTS OF OIL PALM SMALLHOLDERS' AWARENESS TOWARDS *GANODERMA* DISEASE

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ABSTRACT

This research is mainly about the socioeconomic determinants of oil palm smallholders' awareness towards *Ganoderma* disease. Data was collected from the sampled oil palm smallholders through face to face interview by using structured questionnaire. There were 620 respondents have been interviewed in this study, where 500 smallholders from Sabah and 120 smallholders from Peninsular Malaysia. The data analysis was done by conducting descriptive statistics, reliability test, factor analysis, normality test, Mann Whitney test and Kruskal-Wallis test. The findings of factor analysis show that there were three main factors associated with smallholders’ awareness towards *Ganoderma* disease. The factors are awareness on knowledge of *Ganoderma* disease and detection methods, awareness on symptoms of *Ganoderma* disease and control methods and awareness on potential spread of *Ganoderma* disease. The results of comparison test show that there were significant difference in smallholders’ awareness on knowledge of *Ganoderma* disease and detection methods according to farm location and category of smallholder. The comparison test also show that the oil palm smallholders’ awareness on symptoms of *Ganoderma* disease and control methods were different according to the farm location, category of smallholder, age of respondent, smallholders’ main occupation and experience in oil palm. Farm location and experience in oil palm cultivation were also found to be the responsible factors in differentiating the smallholders’ awareness on potential spread of *Ganoderma* disease. The profile on awareness of oil palm smallholders towards *Ganoderma* disease is very important and useful to the relevant stakeholders and agencies in order to help the smallholders in combating the disease.
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<td>ANOVA</td>
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<td>BSR</td>
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<td>CPO</td>
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<td>FELCRA</td>
<td>Federal Land Consolidation and Rehabilitation Authority</td>
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CHAPTER 1

INTRODUCTION

1.1 Introduction
Palm oil is a major commodity used in approximately 30% of foods and cosmetics. Increasingly, palm oil is used as a biofuel and contributes considerably to the economies of many nations particularly Malaysia and Indonesia (Paterson et al., 2009). Oil palm is a “golden crop of Malaysia” since it generates profitable revenues to the nation through the export of palm oil, palm kernel oil, palm kernel cake, oleochemicals, biodiesel, finished products and other palm oil products all over the world (Yusof, 2007). Oil palm (Elaeis guineensis Jacq.) originated from West Africa. Initially, oil palm grows in the wild and later was developed into an agricultural crop. Oil palm commercial planting started at Tennamaram Estate in Selangor and increased rapidly in early 1960’s under government’s agricultural diversification program which was introduced by the government to reduce the country’s dependency on tin and rubber (Malaysian Palm Oil Council, 2013). Oil palm planted area in Malaysia has been expanding over years from 2.69 million hectares in 1995 to 5.23 million hectares in 2013. There is an increase of 94.4% of planted area of oil palm in 18 years. Oil palm has an economic life of about 25 to 30 years. Total revenue from the export of palm oil products in the year 2013 is RM 61,363.35 million (Malaysian Palm Oil Council, 2013).

One major problem in oil palm industry is Ganoderma basal stem rot (BSR) disease, caused by the basidiomycete, white rot, fungal pathogen Ganoderma boninense (Cooper et al., 2011). Ganoderma basal stem rot causes decay of the lower stem and root system leading to severe symptoms such as flattening of the crown and unopened spear leaves (Cooper et al., 2011). Young palms, once infected usually die within 6 to 24 months after the first appearance of symptoms, whereas mature palms survive for 2 to 3 years or more. Ganoderma is called the silent killer of oil palm because the disease symptoms only appear during the late stage of infection. The term “white rot” derives from the fungus degrading specifically the lignin component of wood while
leaving white cellulose exposed (Paterson, 2007). *Ganoderma* infects damaged trees through the airborne spores that enter the readily available wounds of the oil palm which might be caused by shedding of branches or other physical damages. Then, fungus degrades the lignin part of the plant leaving white cellulose exposed (Paterson, 2007).

*Ganoderma* basal stem rot shortens the productive life of oil palm and cause serious economic loses to the palm oil industry. *Ganoderma* may bring serious impact to the economy over years if no actions are taken to combat the disease. The infected oil palms are unproductive during the affected years. Assuming that oil palm estate do not apply treatment and the disease infection follows the same growth pattern, it was estimated that the total area affected by basal stem rot in the year 2020 would be around 44 3430 hectares which accounts about 65.6 million of palm trees (Roslan & Idris, 2012).

### 1.2 Oil Palm Industry and Oil Palm Smallholders

Malaysia is the second largest producer of palm oil in the world, after being overtaken by Indonesia in 2006. Since 1985, palm oil has become the second most consumed oil in the world, after soya bean oil. Malaysia’s share of global production decreased from 51% in 1999 to 38% in 2011 (Malaysian Palm Oil Council, 2013). Export of palm oil makes 4.9% (RM 8.95 billion) of the total export of Malaysia in the year 2015 (Malaysia External Trade Development Corporation, 2015). Malaysia plays an important role in fulfilling global need for oil and fat continual. Oil palm plantations in Malaysia are mostly based on estate management system and smallholder scheme. Malaysian oil palm industry provides income to about one million people and employment to more than half a million people. Malaysian palm oil Association (MPOA), Malaysian Palm Oil Board (MPOB), Malaysian Palm Oil Council (MPOC) and the Malaysian Palm Oil Promotional council (MPOPC) is the principal industry organisation in Malaysia.

Smallholders play an important role in the global palm oil supply chain. Smallholders are farmers growing oil palm, or sometimes along with subsistence production of other crops. Smallholders are classified into two categories, independent smallholders and organized smallholders. Independent smallholders are growers who cultivate oil palm without direct assistance from government, organization or any private company. This group of smallholders sell their crops to local mills or traders.
Replanting of oil palm are done in small scale due to lack in financial resources. Technical advice is given to independent smallholders. MPOB’s guidance and counselling officers (TUNAS) assists independent smallholders to participate in cooperatives to improve cooperation and collaboration with nearby producers.

Organized smallholders are growers who cultivate oil palm with support of technical assistance, agriculture input or financing from either government or any other private organization. Organized smallholders are taken care by big organisations which carry out resettlement and rehabilitation schemes in Malaysia such as Federal Land Development Authority (FELDA) and Federal Land Consolidation and Rehabilitation Authority (FELCRA). Their products will be sold to dedicated mills with mutual agreement. All agricultural inputs are provided by the organization and replanting of oil palm is done in big scale. Smallholders face many issues and challenges in replanting and marketing. Land suitability, agriculture input, high development cost of replanting, capability, technical knowledge and living subsistence are the issues faced by smallholders in replanting. Some major issues faced by smallholders in marketing their products are exploitation and manipulation of price, grading and transportation problems.

1.3 Economic Impact of *Ganoderma* Disease

Malaysian oil palm industry is economically important to generate revenue for the nation. Sabah remains as the largest oil palm planted state in Malaysia accounting 28% of the total planted area in the country (Malaysian Palm Oil Board, 2013). Production of crude palm oil (CPO) increased from 94,000 tonnes in 1960 to 19.22 million tonnes in 2013 (Malaysian Palm Oil Board, 2013), or almost 204 folds within 50 years. The total export of oil palm products consisting of palm oil, palm kernel oil, palm kernel cake, oleochemicals, biodiesel and finished products increased by 4.5% from 24.59 million tonnes in 2012 to 25.70 million tonnes in 2013 (Malaysian Palm Oil Board, 2013). Exports of palm oil increased by 3.3% to 18.15 million tonnes in 2013 (Malaysian Palm Oil Board, 2013). Overall, the total revenue from the Malaysian oil palm industry in 2013 is RM 61,363.35 million. Revenue from oil palm cultivation contributes to the better quality of life of the Malaysian citizens. The growth of Malaysian oil palm industry has helped to reduce poverty among landless farmers in Malaysia, through their participation in FELDA schemes. Overall development of oil
palm is excellent due to assets in climate, soil, plant materials and skilled labour and management.

Oil palm has an economic life span of 25 to 30 years. However Ganoderma basal stem rot can kill more than 80 % of stands by the time they are half-way through economic life (Chong, 2010). This disease causes economic loss among oil palm smallholders in various regions around the world. The average incidence of Ganoderma basal stem rot in Malaysia was 3.71 % with an affected area of 59 148 hectares. As one of the largest producers and exporters of palm oil, Malaysia gives a great importance to continued availability and sustainability of the oil palm industry. Actions have to be taken to minimize loss in revenue. Decrease in the number of palms will affect the reduction in fresh fruit bunches (FFB) and causes lower crude palm oil (CPO) production and losses in export income (Roslan & Idris, 2012). In order to prevent long-term losses, various treatment and prevention techniques should be taken by the smallholders.

1.4 Scope of study
The target group in this study is the oil palm smallholders in Sabah and Peninsular Malaysia. A total of 500 smallholders in Sabah and 120 smallholders in Peninsular Malaysia will take part in this study. Cross sectional survey using questionnaire is used to collect data from the smallholders. Data is collected by face to face interview by using structured questionnaire. In the questionnaire, information such as smallholders’ background, farm background, smallholders’ knowledge on Ganoderma disease, attitude of smallholders towards Ganoderma disease, practices in managing Ganoderma disease, issues and problems in managing Ganoderma disease managing will be collected to be analysed. The data obtained from the questionnaire will be used to study the socioeconomic determinants of oil palm smallholders’ awareness towards Ganoderma disease.

1.5 Justification of Study
The purpose of this research is to identify the factors associated with smallholders’ awareness towards Ganoderma disease. The research findings will be useful as a reference to any association related to oil palm or smallholders for further actions to instil awareness towards Ganoderma disease among smallholders. This research
measure association between socioeconomic determinants with the oil palm smallholders’ awareness towards *Ganoderma* disease. Thus the relationship between socioeconomic characteristics and smallholders’ awareness toward *Ganoderma* disease can be seen clearly.

### 1.6 Objectives

The objective of this study are:

i) to identify the factors associated with smallholders’ awareness towards *Ganoderma* disease; and

ii) measure association between socioeconomic determinants with the oil palm smallholders’ awareness towards *Ganoderma* disease.
CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Elaeisguineensis and Elaeisoleifera are two major species of oil palm. Elaeisguineensis originated from West Africa and Elaeisoleifera originated from South America (Corley & Tinker, 2003). Elaeisguineensisis are commercially cultivated due to its higher yield. Oil palm is grown in a big scale when introduced as plantation crops into Sumatra and Peninsular Malaysia in the early 20th century. The commercial planting started to develop productively in Malaysia after independence in 1957. Oil palm industry is a very important and profitable industry in Malaysia. James Pletcher (1991) concluded that Malaysian mediation into the production and trade of palm oil increased steadily after 1960. Government’s scope of its regulation and presence in the palm oil industry increased where the prices of palm oil and palm oil products were never officially controlled. He also concluded that the form of mediation which the Malaysian government employed and the achievement of the industry gave a boost to new domestic economic and political forces which helped build policies in the palm oil industry.

Smallholders face many challenges in handling numerous pest and disease problems in the cultivation of oil palm. Two major problem faced by smallholders are fungal pathogen Ganoderma boninense and the rhinoceros beetle, Oryctes rhinoceros. In this study, we will focus on Ganoderma basal stem rot. Ganoderma boninense is a soil-borne fungus that causes basal stem rot. High occurrence of basal stem rot results in economic downfall and extreme loss to the smallholders due to zero harvest from dead palms and decreased number and weight of fruit bunches in infected but living palms. Early detection of Ganoderma infection is important in order to prevent and control the disease from worsening. Thus, smallholders have to take efforts to prevent and control the disease to minimize their loss, increase productivity and promote healthy oil palms.
REFERENCES


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