THE RESPONSE OF CRUDE PALM OIL MILL TO ENVIRONMENTAL REGULATION AND INFORMATION-BASED ENVIRONMENTAL POLICIES.

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Abstract

Environmental policies are crucial in ensuring sustainable environmental preservation. But tough environmental regulations mean little if society does not have the resources or will power to back them up. This paper investigates the firms' compliance to environmental regulation and their behavioral response to information-based environmental policies. Three crude palm oil mills in Kedah are surveyed to gather information on the companies' level of compliance to environmental policies (command and control) and also responsiveness to information-based environmental strategies. Findings found that all three mills not only comply with the environmental regulation, but also applied some of information-based policies listed in Corporate Environmental Reports and Environmental Audit System.

Key words: Environmental regulation compliance,Command and Control Environmental regulation, Information-based environmental regulation.

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1.0 Introduction

Command and Control Regulations is one of a way of government's effort to control pollution by industries and households. However, economic analysis shows that in certain circumstances, implementation and monitoring are too costly, and in other circumstances incapable to achieve the desired objectives. On the other hand, there is another instrument to control pollution that is market-based instrument. These instruments use environmental tax such as pollution tax, emission charges and tradable permits. Both instruments are developed to overcome market failure.

An alternative to Command and Control Regulations Policy rises in the 1990's known as information-based environmental instruments. The objective of these instruments is to change behaviours of economic agents (firm and individual) to oblige voluntarily to environmental caretaking. These instruments range from Company Environmental Reports, Environmental Audit and Management Schemes (such as ISO 14000), Environmental Management System (EMS), and related award and compensation systems (Siniscalco et.al., 2000). Establishment of EMS is the first step to ensure existence of an environmental policy in any organisation. Organisation on the other hand is responsible to plan activities and programs to realize the objectives of EMS. With clean technology, sustainable environmental preservation is possible.

This paper is divided into four sections: section one presents background of the study; section two describe the methods used; section three includes findings of the study; and section four is the conclusion.

1.1 Background of the Study

Like other things, process of getting palm oil involves natural resources. Graph 1 shows the flow of natural resources in the Material Balance Model. The inflow is the usage of natural resources and raw materials in the production process whereas residuals from the production process become the outflow. For example, the inflow of fresh fruit bunches, energy sources and water to transform the fruit into crude oil. Some natural resources are renewable in nature and some are non-renewable, some are reusable and some cannot be reuse. Crude palm oil processing generally produces residuals such as empty fruit bunches, fibres and shells which become the outflow. However those residuals can be minimized, reduced or eliminated by implementing recycling, reusing and treatments before releasing them back into the environment. Another way to reduce pollution or effluent from production and consumption is by adoption of cleaner technologies. This can be done by changing the perceptions of firm's managers and owners to change to more environmentally friendly technologies. However there are a lot of obstacles affecting the usage of cleaner technologies such as lack of expertise, low awareness of environmental issues, financial problems, lack of communication in firms, unsuitability of firm's ability, lack of regulations etc.

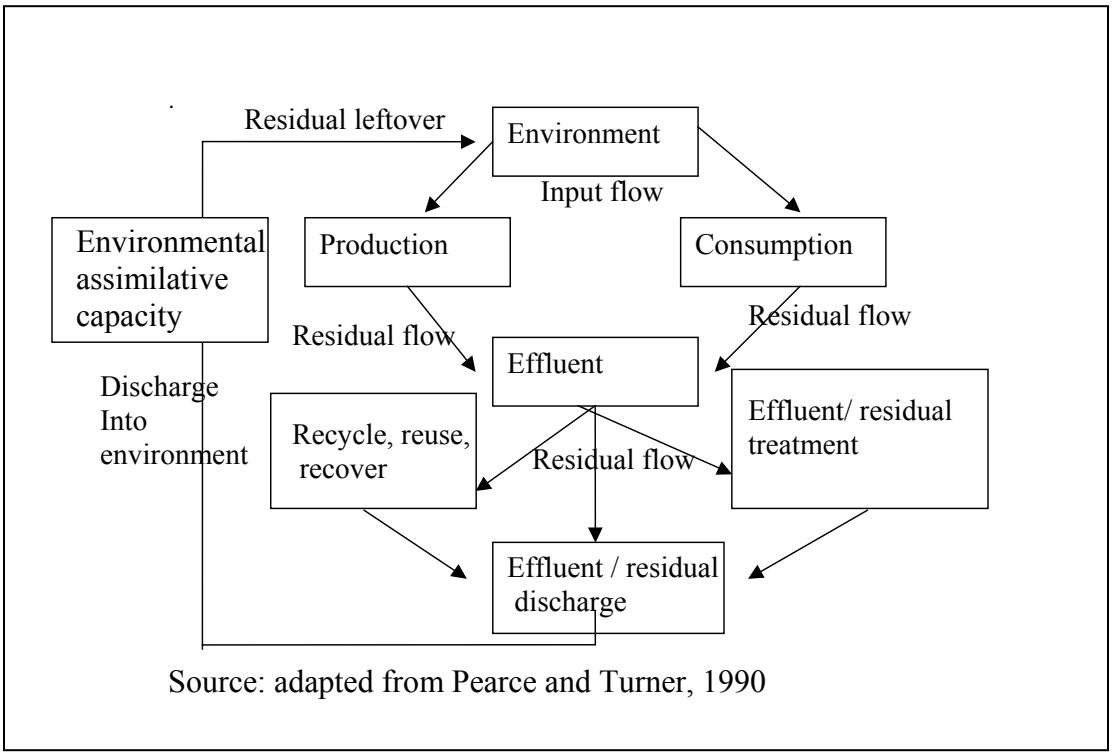

Figure1: Material Balance Model

Pollution is defined as wastes or residuals emitted to the environment that destroys nature. The wastes can be from industrialisation, domestic use or agriculture. Royston (1979) defined pollution as any residual emitted to the environment that harms any ecosystem around it. Every country of the world had set standards of pollution granted. Any violation to the standard is considered a crime. Firms or individuals will tend to flout the rules and regulations if they think the benefits of doing so is greater than the cost or circumstances they have to pay or face (Gray and Deily, 1996).

Environmental economics normative approach assumes that a firm is rational at the time they make decision either to comply or to violate the environmental laws or regulations. The decision is based on cost benefit analysis. The benefits of complying with environmental laws are essentially the avoided cost of punishment: monetary costs (fines and penalties), a damage reputation (both for corporate and individuals), and the fear of jail terms. The expected benefit depends upon two factors: the magnitude of the punishment if imposed, and the likelihood of getting caught and convicted. The costs of compliance, on the other hand, are simply the additional outlays needed to install, service, and maintain pollution-control equipment, and complete the relevant paperwork.

In Malaysia, according to Environmental Quality Act 1974, for every violation convicted, there are two types of fines; fines per unit of extra residual emission plus a lump sum fines for damage to the environment. Other penalties include fines of maximum of

RM10,000 or 2 year jail or both. They can also be fined RM1,000 a day for each day of violation up to the date of notice is serve by the Head of Department of Environment. A RM10,000 fine can be considered low compared with the benefits they get for not complying. Besides, the probability for them to get caught is pretty small based on weak monitoring and enforcement by the authority. According to Keeler (1995), a few factors affecting the compliance to the law is; one, the regulation and standard set does not guarantee a standard environmental quality; and two, lack of understanding of the suitability of the abatement tools. Most regulations are established base on certain objectives without considering the cost involved.

Table 1 shows the difference in environment management strategies between the proactive, reactive and not active actions towards environmental management strategies (Roome (1992), Nielsen and Remmen (1994)). There are three stages of compliance. The first stage is just to comply with standards set by the authority. The second stage includes some conservation effort through innovation or assembling abatement tools, recycling and reusing effluent as input in their own firms or other firms. The third stage is when firms hire consultant to manage wastes more efficiently. Crude palm oil mills can ensure a good environment quality by using clean technology or employing a good environmental management system or both or in other words establishing information-based instrument policy. In certain situation improvement in environmental quality is influenced by their innovation ability (Barrantes, 2001).

The roles of authorities have big influence on compliance decision by firms. Continuous monitoring and stringent enforcement are pressures to ensure firms comply with environmental regulations. One way to comply is by investing in relevant technologies in reducing pollution (Russel, 1990). Gray and Deily (1996) found that a strict enforcement lead to high compliance among firms. A few other factors identified as contribution to compliances are; one, compliance cost or costs incurred by firm to abide to environmental regulations such as fixing abatement tools; two, characteristics of firms where firms with economies of scale are always assumed to achieve high compliance standard while firms without economies of scale are frequently being fined.

Compliance level can also be assessed through information-based environmental policy. According to this policy there are three methods that can be used to measure interactive compliance level of a firm towards environmental regulations based on integration of instrument sets. The method includes environmental report, environmental auditing system and award and compensation scheme. The authority responsible for environmental matters like Department of Environment needs to appoint relevant agencies or consultant firms to assess the compliance situation of all factories that need to be assessed. The assessment should include environment issues related to the operations of those factories such as the amount of residuals emitted and also the conditions of rivers nearby. Factories can use the reports as a guide in estimating level of damage they cause to the environment and it can also be guidance for them to correct their nature of operations so the damaged done can be reduced.

Table 1: Enviromental Strategy by Industry

Roome (1992)	Remmen and Nielsen (1994)	Characteristics
Non-compliance	Inactive	No reaction and do not comply to environmental regulation as no punishment or ordinance action are taken on violation of environmental law
Compliance	Reactive	Always comply with the environmental regulation.
High Compliance	Proactive	Always comply with the environmental regulation plus recycle, reuse and treat palm oil waste due to their awareness of society welfare. The environmental management is very important. Willingness of top management to give high priority to environmental management.
Excellent Level of Compliance	Interactive	Have excellent environmental management agenda and achieve environmental quality targetted, the ISO14000 An excellent model to other firms. Environmental management system always a priority.
Leading edge		Capable of setting standards to other firms. Environment always a generation priority.

Source: Adapted from Barantes, 2001

Environmental auditing system can also be used to measure level of compliance. Factories can adopt this system voluntarily where they will be given a guideline to ensure their production activities does little damage to the environment. ISO 14000, launched by the International Standard Organization will certify and grant firms with good environmental management with ISO 14000 certificate. Besides the above, award and compensation scheme can also be used as a measurement of level of compliance. Any scheme of awarding or compensating related to environmental decision is an incentive strategy that can be used to integrate environmental issues with firms' management.

1.2 Methodology

The aim of this study is to identify compliance level of crude palm oil mill in Kedah. There are only three mills in the whole Kedah state and we surveyed all of them. The identification is based on characteristics of environmental strategy introduced by Roome (1992) and Nielsen and Remmen (1994) (as shown in Table 1). We divide the compliance level into four stages: Bad, Good, Very Good and Excellent (refer to Table 2). The information on crude palm oil mill compliance is gathered through the report published annually by DOE and through interview with DOE enforcement officer. A survey is also conducted by interviewing through telephone and posted questionnaires. The questionnaires basically pose questions like do they recycle or not, do they possess instrument to control pollution, do they treat palm oil residuals etc.

Table 2 : Characteristics of Compliance Levels

Compliance Level	Characteristics
Bad	No reaction and do not comply with the environmental regulations imposed by Department of Environment.
Good	Do comply with the environmental regulations imposed by Department of Environment.
Very Good	Do comply with the environmental regulations imposed by Department of Environment. Imposed recycle, reuse, treat residuals and use clean technology. Concern about society welfare. Give high priority to environmental management system.
Excellent	Achieve ISO 14000

1.3 Findings

Result shows that all the three crude palm oil mills in Kedah comply with the standard set by the government. This is basically based on the annual report made by the Department of Environment (DOE) through their regular monitoring procedures on effluent standards. According to the DOE report, all the three crude palm oil mills in Kedah always comply to the standards.

Therefore, based on the characteristics present in Table 2, all three firms are in VERY GOOD compliance level. Reports by Department of Environment (DOE) of Kedah stated that every year crude palm oil mills not only 100 percent comply with the POME (Palm

Oil Mill Effluent) regulations under the Environmental Quality Act 1974, but also recycle and treat residuals, possess abatement tools, giving a high priority to social welfare and even introducing environmental auditing system. Table 3 presents briefly the actions each crude palm oil mill in Kedah had taken in implementation of the information-based environmental policy. For recycling, the mills incinerated the empty fruit bunches to produce potash which is applied in the plantations as fertilizer. The fibres ands shells are utilized as fuels to generate process steam and electricity in the palm oil processing mill itself. Pollution abatement to treat pollution such as pond system, dust cyclone, dust collector, and dust decoder are also installed in all mills.

Regarding education and training, all crude palm oil mills (except Firm B) involves actively in conference and seminar that related to the crude palm oil and environmental issues. There are two way communications among and between top management and lower management level and stakeholders especially to discuss the workers welfare and environmental issues during the production processing.

Almost all firms had taken all actions listed except appointment of a consultant to prepare environmental report that only done by Firm B. but Firm B lack of one action that is provide education and training to their employees. Overall, we can conclude that all mills in Kedah had also implemented the information-based environmental policy.

Table 3: Characteristics to identify implementation of the Information-Based Environmental Policies

Characteristics for Second stage of compliance	Implementation status		
	Firm A	Firm B	Firm C
Recycle, reuse and treat palm oil residue	√	√	√
Possess instrument to control pollution	√	√	√
Treatment plant	√	√	√
Priority to community welfare	√	√	√
Explain to stakeholders about environmental and factory issues	√	√	√
Appoint consultant for environmental report preparation	-	√	-
Role of management group	√	√	√
Education and training	√	-	√

1.4 Conclusion

Information-based environmental strategies play a significant role to ensure companies comply with environmental regulation. Our study confirms the existence of many integrated environmental and management schemes (corporate environmental report and environmental audit scheme) adopted by firms. In that sense we can conclude that all firms in Kedah had applied some of information-based environmental policy as their

effort to protect the environment. Even though they have not yet achieve the ISO 14000 standard, but they have taken actions to obtain it by year 2010.

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