

CHAPTER I

INTRODUCTION



1.1 Motivation

Thailand experienced a rapid industrial growth during the past two decades resulting in the total number of industries increased by more than hundred percent compared with the year 1958. This growth and expansion of the industrial sector is considered one of the major causes for deterioration of the environment. Lack of effective environment protection plans and legislation has made the situation more serious.

Department of Industrial Works (DIW), with supporting of Deutsche Gesellschaft Fur Technische Zusammenarbeit GmbH (GTZ) have studied and planned for an implementation of economic instrument. Up to now, the studies concluded that Emission Charge (EC) and Pollution Management Fee (PMF) are the suitable schemes that should be applicable for pollution abatement in Thailand.

Implementation of EI will require a large amount of information and adequate period of time for preparation before actual EC collection can be made. Before EI is officially in effect, apart from activities that DIW itself will need to exercise, the factories under EC system will be required to conduct monitoring and recording of their plant information to report to DIW. DIW should therefore issue some form of notifications or requirements to all factories under EC system to instruct them to carry out the necessary activities.

One important activity to be carried out in the period before actual EI application by the relevant organizations is the study on the impact of Emission Charge on the factories under the EC scheme. This study introduces to the appropriate charge rate for consistency to the current economic situation. Furthermore, the conclusion from the study could guide the relevant organizations the respond of factories and inadequate activities need be proceeded further.

Palm oil mill is an agriculture-based industry and also generates high BOD load. The implementation of the Emission Charge on palm oil industry may effect to the associated industries. From Malaysia's experience on an implementation of economic instrument, it indicated that it was not possible to shift the increased costs of the production onto the consumers. Instead, two-thirds to three-fourths of the costs were shifted upstream and ultimately born by oil palm growers, who had no outlet for palm oil fruits aside from sales to the palm oil mills (Khalid; Khalid and Braden, cited in UNESCAP, 2001). Thus, the environmental protection did not impair the competitiveness of the exporting sector. It significantly changed the distribution of returns to trade, affecting in particular producers of primary inputs (UNESCAP). To ensure on effective application of economic instruments, the effected organizations such as factories, farmers, responsible governments, and third parties have to be identified and evaluated.

1.2. Objectives

1.2.1. To study the impact of emission charge (EC) on current economic performance of palm oil mill industry

1.2.2. To determine the relationships between the level of willingness to pay (Baht of EC per ton of product) and their;

- profit/loss
- production capacity
- level of policy maker's education
- existing treatment level
- existing wastewater management or application of their treated wastewater
- environmental policy of the palm oil mill industry

1.3 Scope of the Study

1.3.1. This study will focus the impact of emission charge on the palm oil mill industry with high BOD load and major raw materials from agriculture. The surveyed factories covered 15 factories out of all 20 wet-process factories.

1.3.2. This study analysis is based on actual data from factories surveys and based on year 2001 data.

1.3.3. Economic performance (profit/loss) calculations are based on average production cost. Over 80% of palm oil mill production cost is from raw material that also related to CPO production .Thus, the marginal production cost of palm oil mill industry nearly equal to average production cost.

1.3.4. The economic impact on industry will be analyzed base on the emission charge (EC) equation that purposed by DIW;

$$EC = f * c * B$$

which c = 35 baht/kgBOD,
 f = arbitrary coefficient = 1
 B = BOD load kg/year

1.4 Hypothesis

1.4.1 An implementation of EC will affect to the economic performance of palm oil mill industry due to EC payment will increase production cost and reduce profit. It also reduce the competitive capability of industry in world market. Well understanding on impact of EC may reduce a burden on industry by providing an appropriate policy via coefficient 'f'.

1.4.2 The *willingness to pay** for EC of POM factories depend on profit, production capacity, level of policy marker's education, existing treatment level, existing wastewater management, and environmental policy of the POM industry. The better conditions those factors exist, the higher willingness to pay factories have.

* *The value of a good to somebody is what that person is willing to pay for it..... Willingness to pay, in other words, also reflects ability to pay*" (Field, 1994) This study defined; "Willingness to Pay = Ability to Pay" for EC of palm oil mill factories.

1.5 Methodology

1.5.1 Collect the data from previous study including, influent and effluent BOD concentration, wastewater flow, economic performance, raw material and production capacity for being the representatives of all wet process factories.

1.5.2 Calculate the full emission charge (EC) per liter of product or ton of raw materials.

1.5.3 Study economic performance of the factories using collected information from their annual reports.

1.5.4 Design a questionnaire for interviewing and collecting data to evaluate the impacts in term of Baht/ton of product or ton of raw material and the willingness to pay for EC of factories.

1.5.5 Apply the questionnaire to the factories by mails and then conduct the on-site interviews.

1.5.6 Analysis the data from the questionnaires in term of:

1.5.6.1 Impacts of EC refer to their economic performance;

- EC per profit/loss
- EC per ton of product or per ton of raw material

The analysis of EC impacts is considered 2 conditions: without AFTA obligation and with AFTA obligation

1.5.6.2 The relationship of the willingness to pay (Baht of EC per ton of product) of industry under the emission charge and their;

- Profit/loss
- Capacity
- Level of policy maker's education
- Existing treatment cost or existing treatment level
- Existing wastewater management or application of their treated wastewater
- Environmental policy of the palm oil mill industry

1.6 Benefit from the Study

Palm oil mill industry has played important role in the Thai economy because oil palm thrives well in Thailand. Palm oil is edible and associated with many industries. The upstream industry is FFB plantation, which generate much employment to farmers, and workers as well as of palm oil mill industry and refinery industry. Crude palm oil and refined palm oil are also use as feed stock by a large variety of industries such as, food and snack industry, cosmetic industry, non-dairy cream, soap and so on. Thai palm oil accounts for as much as 62 percent of the vegetable oil, estimated to be worth a huge 40,000 million Baht per annum (Bangkok bank Public Co., Ltd., 2001). Accordingly, the impacts of emission charge implementation have to be identified and evaluated. If palm oil mill industry is effected from emission charge scheme, it is assured that the affiliated industries also be effected. This study could fulfill the requirement of overview on the impacts of EC and advocate the related organization such as the governments, the industries under EC scheme, third parties and the academic institutes to prepare themselves for the earlier implementation of economic instruments policy. The correctly understanding on EC impacts will instruct responsible governments a practical implementation plan that not much effect to factories.