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Perceptions of Private Sector towards the Pollutant Release and Transfer Register: A Case Study on Petrochemical Industry in the Map Ta Phut Industrial Estate, Rayong, Thailand

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Abstract

Under the Rio Declaration and Agenda 21 from the United Nations Conference on Environment and Development in 1992 as well as other international agreements, Thailand is currently in the process of adopting the Pollutant Release and Transfer Register (PRTR) through a pilot project in Rayong province with assistance from the Japan International Cooperation Agency (JICA). This research aimed to study perceptions of private sector towards the PRTR through a case study on petrochemical industry in the Map Ta Phut Industrial Estate. Through semi-structured questionnaires and in-depth interviews, the study found that the petrochemical industry viewed that benefits of the PRTR for the government and civil society is quite clear, while each petrochemical company has different understanding on such benefit for private sector to be as sustainable industrial management. Various incentive measures and concerns on the PRTR were also indicated in this study.

Keywords: perception; private sector; Pollutant Release and Transfer Register (PRTR); petrochemical industry; Map Ta Phut Industrial Estate

1. Introduction

Along rapid economic development, industrial pollution has caused various negative impacts on the environment and public health in both developed and developing countries. Pollution issues often create different interests among stakeholders that would make the issues more complicated and taken longer time to be solved. In this regard, the concept of sustainable development has been introduced to the world since 1987 in Our Common Future (the World Conference on Environment and Development, 1987). Humans cannot sustain their lives without considering the balance among the environment, society, and economy.

A Pollutant Release and Transfer Register (PRTR) is becoming an important measure to address industrial pollution issues in many countries (Kerret *et al*., 2007). The Organisation for Economic Co-operation and Development (OECD) defined the PRTR as "an inventory of pollutants released to air, water and soil, and of waste transferred off-site for treatment and/or disposal. Facilities releasing one or more of the chemicals listed report periodically – usually annually – on what was released, how much, and to which environmental media" (OECD, 2000). The PRTR enables interested parties to share information and communicate for solving pollution issues together. The concept of the PRTR was one of the outcomes of the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro in 1992 (Lerche *et al*., 2004). As stated by the Pollution Control Department (PCD) in 2009, Thailand is currently in the process of adopting the PRTR for better chemical management, which includes strengthening capacities to report or implement some international agreements such as the Stockholm Convention on Persistent Organic Pollutants (POPs) and the Strategic Approach to International Chemical Management (SAICM).

The Map Ta Phut Industrial Estate (MTPIE), a state-own industrial estate, is located at the Map Ta Phut Industrial Area in Rayong province on the eastern coast of Thailand. The establishment was under the governmental policy (the Eastern Seaboard Development Program) to develop the eastern seaboard of Thailand to be one of the main industrial complexes (Muto *et al*., 2007). However, while economic development was growing, industrial pollution has caused negative impacts on the environment and public health in the area. Although regulatory systems have been provided under an improvement including public and private sectors, it seems that pollution issues are still remained at the civil society concerns.

Regarding the problems taken place, the Japan International Cooperation Agency (JICA) has initiated a pilot project of the PRTR in Rayong province in 2011. In order to promote the using of the PRTR, a private sector would be one of the important stakeholders because the PRTR is mainly relied on the private sector for data relevant inventories. The petrochemical industry is considered as one of the crucial industries that could be applied the PRTR concept for sustainable industrial management. In this regard, the study on the perceptions of private sector towards the PRTR focusing on the petrochemical industry in the MTPIE is of interest applicable and meaningful for sustainable industrial management.

2. Materials and Methods

2.1. Correspondents

This study focused mainly on the petrochemical industry at the MTPIE as a case study. The MTPIE occupies an area of 9000 rai (1440 ha) comprising eighty-nine companies which thirty-two of them are petrochemical businesses. This study also included responsible organizations namely the JICA, the PCD, the Department of Industrial Works (DIW) and the Industrial Estate Authority of Thailand (IEAT). Furthermore, four key informants from an academic, a technical expert and the Non-Governmental Organizations (NGOs) who participated in this project both directly and indirectly were taken in this study.

2.2. Semi-structured Questionnaire

A set of questionnaires for the petrochemical industry was developed with five parts, namely a company profile, an environmental reporting, a familiarity with the PRTR, potentials of the PRTR, and suitable conditions for private sector to implement the PRTR. The questionnaire was applied including open-ended and closed-ended questions with categorical or nominal response choices (Fink, 2003). Questionnaires for organizations are similar to the questionnaire for the industry, excluding a part of environmental reporting. The questionnaires were analyzed by descriptive statistics.

2.3. In-depth Interview

In-depth interviews to the petrochemical industry have contents of questions relating to the PRTR similar to the questionnaire. However, the in-depth interview was conducted as an open-ended question in order to obtain more details and reasons for how much understanding on the usefulness of the PRTR for sustainable industrial management and the suitable condition for private sector to implement the PRTR process. Responsible organizations and other key informants were also interviewed to gain comprehensive understanding of persons relevant on this issue. Interviews toward petrochemical industry were analyzed using the content analysis.

3. Results and Discussion

3.1. Semi-structured Questionnaires

Five petrochemical companies agreed to answer the questionnaire. The response rate of petrochemical industry for questionnaire was about 15.6% of the total thirty-two companies. Moreover, all of the four responsible organizations answered for the questionnaire.

3.1.1. Demographic of Participants

Among five participating companies, one was a president, one was a manager and three were engineers. Meanwhile, among four responsible organizations, two were directors, one was an engineer, and one was an official representative. On the scope of company operation, they were diverse among them that one was at a national level, two were at a regional level and other two were at an international or a global level. In terms of the number of employees, one employs between 11-100 people, two employ between 101-500 people, and the other two companies employ between 501-1000 people.

3.1.2. Familiarity with the PRTR

The familiarity with the term "PRTR" was asked by using the scale from number 1 (Not familiar) to 10 (Most familiar / Expert). Rating average for the familiarity of the petrochemical industry was about "4.6". Meanwhile, responsible organizations ranked the familiarity of private sector in Thailand based on their assumptions. The rating average was about "4.5". This is quite similar to the rating average of the petrochemical industry itself. However, there was a range among responsible organizations' answers for their assumptions on the familiarity of the petrochemical industry with the term "PRTR" because one organization indicated "2" (the lowest point) and another organization indicated "6" (the highest point).

3.1.3. Usefulness of the PRTR

Usefulness of the PRTR for Sustainable Industrial Management (SIM), governments, civil society and private sector were respectively asked by providing four answer options, namely "Yes", "More or less",

"No" and "Not sure". Firstly, for the SIM, two companies and four organizations answered "Yes" while two companies answered "More or less". Another company indicated "Not sure" because of many kinds of reports on pollution release presently. Secondly, the usefulness for the Thai governments was well-understood among participants. Four companies and four organizations indicated "Yes", while one company indicated "Not sure" because of the obscurity in governmental policies. Thirdly, the usefulness for civil society was also well-understood. Four companies and four organizations indicated "Yes", while one company indicated "Not sure". Fourthly, the usefulness for private sector, one company indicated "No" and another one indicated "Not sure". Despite these two companies, other three companies and four organizations indicated "Yes". Therefore, the usefulness for governments and civil society was highly supported by the industry more than the one for the SIM and private sector. It seems that the understanding of petrochemical industry on the usefulness of the PRTR is different depending on each stakeholder, while the organizations see the usefulness similarly for all stakeholders.

3.1.4. Suitable Conditions for Private Sector

On the incentives or merits of the PRTR for private sector, benchmarking, technology transfers, tax incentives and an improvement of environmental management were indicated by the participating companies. However, there was one company mentioned some difficulties to find incentives due to the increase of costs. Meanwhile, responsible organizations pointed out other incentives such as rewards, enhancing communication with other stakeholders and reducing costs through improving the management.

Regarding the needs in assistance, six kinds of assistance were listed and asked about its level of necessity. There was one responsible organization indicated "Not sure" for this question because they are still in the process of designing the basic PRTR scheme. The answers from both petrochemical companies and responsible organizations were designed into the scale of 3, 2, 1, and 0. Fig. 1 shows the comparison of perceptions on needs of assistance between petrochemical industry and responsible organizations based on the rating averages.

Among six categories needed to assist, the petrochemical industry mentioned that "Training of staff" was highly in need of assistance, while "Financial assistance/Funding" was less need than other assistance. Meanwhile, responsible organizations ranked "Management consulting/Advisory services" as the highest level of necessity to be assisted and "Financial assistance/Funding" was in the lowest need of necessity for private sector that confirms the views of petrochemical industries. Therefore, "Training of staff" seems to be one of the most important assistance for the petrochemical industry.

On the importance of including the emission from non-point sources such as mobile, agricultural, and household sources, all of the four organizations and three companies stated that the PRTR should include non-point sources, while other two companies answered that the PRTR in Thailand did not need to include such sources.

Furthermore, only two petrochemical companies indicated benefits of the PRTR as that the government would benefit on the environmental management. There was one company indicated that there would be no benefit in the PRTR. Meanwhile, three organizations

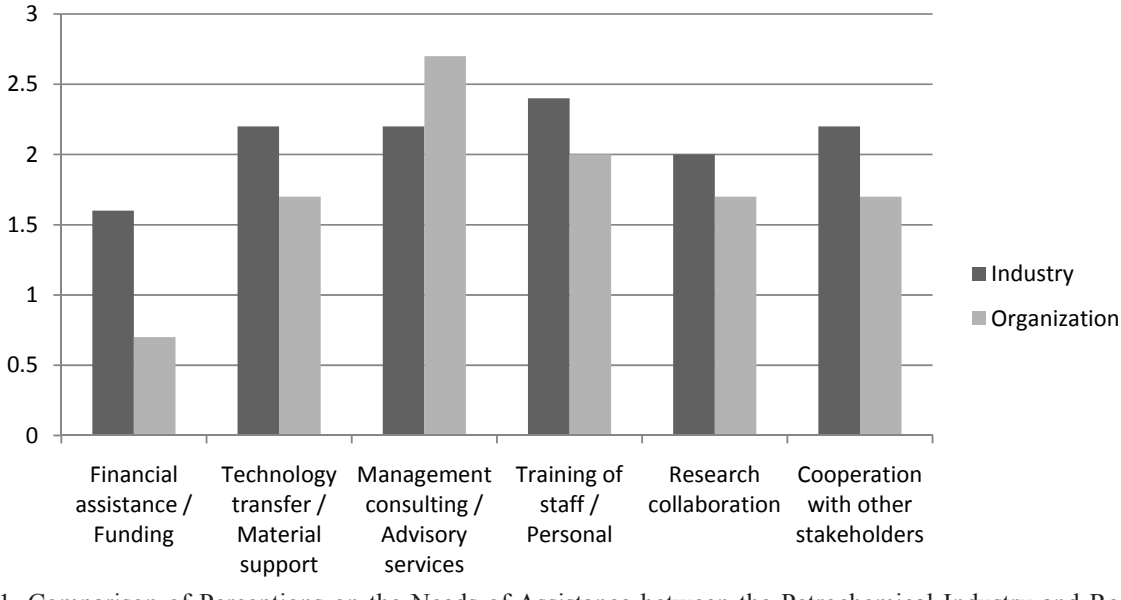

Figure 1. Comparison of Perceptions on the Needs of Assistance between the Petrochemical Industry and Responsible Organizations

indicated the benefits of the PRTR not only for the governments but also for other stakeholders such as constructive discussions about the chemical substances and its risks, supporting the sustainable development, reductions of damage costs, and increases of production.

When it comes to barriers of the PRTR, one company mentioned the complexity of data, the clarity of its definitions, and the overlaps in the reporting systems. Another company declared the necessity of guideline and assistance on how to do the PRTR for the first period of implementing the PRTR. Meanwhile, one organization indicated no data input/wrong information, insufficient training program, and lack of sustainable management, while another one indicated how to calculate the emission factor correctly and the lack of awareness and capacity in the governmental sector.

3.2. In-depth Interviews

Four petrochemical companies agreed to answer the interview. The response rate of petrochemical industry for interview was about 12.5% of the total thirty-two companies. Since the population size is quite small and each person is a key informant for this study, the interview could be seen as an appropriate method (Gillham, 2000). Furthermore, Gillham (2000) mentioned that in case of a sensitive topic, face-to-face interview would be useful to build trust with informants and to obtain information that is not disclosed in the anonymous questionnaire. In addition to the four companies, three responsible organizations and other three key informants were interviewed and discussed.

3.2.1. Merit of the PRTR

The petrochemical industry in this study perceives the merits of the PRTR differently. Two companies mentioned that the PRTR can contribute to an improvement in the whole production processes and a recovery of the loss from the emission. One of these two companies also mentioned that reporting more detailed emission data for the PRTR can lead to build positive corporate images. Another company mentioned a merit of collecting the emission data of various pollutants based on the same standard within the PRTR flame-work. One company indicated that there would be no merit directly contributed to business, while this also mentioned that it could be mandatory for private sector to implement the PRTR from the perspectives of the civil society.

3.2.2. Importance of Non-point Source

All of the four participating companies think that it is better to see the overall emissions of chemical substances not only from factories but also from other sources. Two companies explained that chemical emissions from the non-point sources could have harmful impacts on the environment and society. However, one company mentioned that it might be difficult to estimate such emissions precisely in the beginning of this pilot project in Thailand. Regarding the lack of capacity in the governmental sector, this company suggested focusing on point sources in the beginning, and then expanding to other sources in the process of implementing the PRTR.

3.2.3. How to Implement the PRTR

The petrochemical industry expressed their suggestions such as educating stakeholders about chemical substances, ensuring the level of understanding on scientific aspects of the PRTR among team members for this PRTR pilot project, avoiding the overlapped or too detailed forms for the PRTR reporting, and informing private sector of a time line and guidelines for the PRTR project.

3.3. Discussion

In-depth interviews of stakeholders found several misunderstanding towards private sector. Firstly, one of the key informants concerned that the industry might refuse to implement the PRTR because of the cost increases, difficulties to measure the emission, or the confidentiality of those data. However, this study found that some petrochemical companies were willing to implement the PRTR and there was only one company reluctant to implement the PRTR, not only due to the cost and technical barriers, but also due to the stakeholders' ability to understand the scientific PRTR data correctly. As mentioned by most of the participating companies, what they concern is more than the cost and technological barriers, but rather the overlaps in the reporting systems and the stakeholders' ability to understand the scientific PRTR data correctly. Secondly, one of the responsible organizations mentioned that the industry will not join this project if the PRTR does not include non-point sources. However, this study found some companies willing to implement the PRTR whether it includes such sources or not. Also, other companies mentioned various concerns such as the lack of scientific knowledge among stakeholders beyond the matter of including non-point sources.

4. Conclusion

This study found that the petrochemical industry viewed benefits of the PRTR for the government and civil society is quite clear, while each petrochemical company participated in this study has different

understanding on such benefit for private sector to be as sustainable industrial management. Regarding suitable conditions for private sector, various measures to build up any incentive for private sector to implement the PRTR were suggested such as tax incentives, benchmarking, technology transfers, and improvements of environmental management. Other positive aspects such as a recovery of the loss in the process, building good corporate images, and collecting emission data comprehensively using the same standard could be counted as good incentives. Furthermore, the petrochemical industry expressed their concerns on the PRTR such as cost increases, overlaps in reporting systems, manpower needs, the lack of governmental feedback, and the lack of knowledge on chemical substances among stakeholders. The study also found that training of staff is more important than funding for the industry. Due to various constraints such as language barriers, time constraints, and the sensitivity of the issue in the study area, this study was engaged by six petrochemical companies. Future research may increase the number of participants and focus on different kinds of industries or local communities. The relationships between the scale of company and needs of assistance would be also important to be studied more deeply for an effective implementation of the PRTR.

Acknowledgement

This research required input from various stakeholders on the Pollutant Release and Transfer Register (PRTR) including the petrochemical industry in the Map Ta Phut Industrial Estate and responsible organizations such as the Japan International Cooperation Agency, the Pollution Control Department, the Department of Industrial Works, and the Map Ta Phut Industrial Estate. Furthermore, other key informants (an academic, a technical expert, the NGOs) gave precious opinions for this study. Sincere thanks are to be given to all of the participants for their valuable information in this research.

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