Coverage and Reliability of Industrial Waste Data in Thailand

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1.Introduction

Industrial sectors in Thailand have been growing up rapidly during the last several decades. The amount of the industrial wastes are increasing accordingly every year. The most significant problem in managing the industrial waste of the country is due to the lack of an effective industrial waste data collection system. Thailand has its own industrial waste data collection system, but it is wondered whether the collected industrial waste data of the country is reliable and can cover the industrial sectors as well as the waste locations (provinces) or not. The aim of this paper is to study the coverage and the reliability of the industrial waste data in Thailand.

2. Coverage of Industrial waste data in Thailand

Thailand has a regulation to force every registered Factory all over the country to inform to the industrial Waste Section of the government about the amount of Their generated industrial wastes as well as their plans of the waste treatment.Fig.1 shows a procedure in declaring the waste treatment plan. The factory which generated more than 1 ton of waste must inform the amount of waste and disposal method. The information must be prepared and submitted to Ministry of Industry (MOI), and then stored in the MOIwaste database The declared waste treatment plans are grouped according to their factory size into small, medium and large groups. The number of registered factories,number of declared factories, the percentage of declared factories as well as the amount of declared waste treatment plans were calculated and shown in Table 1

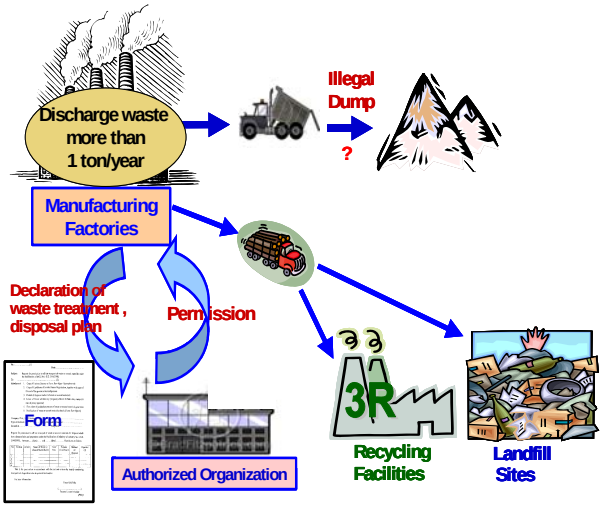

Fig. 1 Thailand's industrial waste data collection system

It was observed that the percentage of factories that declared waste treatment plan and disposal to MOI is only 4.49%, especially small sized factories, declaration percentage is very small (0.65%). There are two possible declared waste treatment plans were calculated and shown in Table 1.

3. Reliability of industrial waste data

3.1 Method of the study

The declared waste amount obtained by MOI and the estimated waste amount obtained from JICA's sample survey were compared in this study.14,463 waste treatment plans submit to MOI from the declared registered factories in year 2004 were used to calculate the amount of industrial waste generated. The waste generation rate per labor of 33 industrial types from the JICA's study in year 2001[1)] were used to estimate the amount of generated waste in each industrial type and its location by multiplying with the number of labour in the registered factories of the corresponding industrial type.

Next, we compared the unit waste of Thailand with China. Based upon the waste reasons that caused this situation.One is their waste generation was less than 1 ton, the other is some companies did not declare waste treatment plan because they ignored declaration data of China in year 2000[2)], the industries were grouped

Table1 Percentage of factories that declared waste treatment disposal plan in total registered factories in Thailand, year 2004 (by factory size)

Size of factory	Amount of waste x 1,000 (Tons)	% Amount of waste	No. of declared factories (A)	No.of registered factories (B)	% of declared factories (A/B x 100)
Small	77.7	0.9	353	54,184	0.65
Medium	1,349.6	15.4	1,180	29,438	4.01
Large	7,159.2	81.6	3,620	34,828	9.42
Unregister	183.8	2.1	321	N/A	N/A
Total	8,770.2	100	5,474	122,050	4.49

into 9 industrial sectors. Unit waste per production output of Thailand were calculated by using the amount of generated waste declared by the registered factories, in year 2004 divided by the production output prepared by National Statistical Office (NSO).

3.2 Results

The (MOI data) amount of generated waste from declared factories and the estimated amount of waste by JICA were compared by their 33 industrial types and waste locations (76 provinces) as shown in Fig.2 and Fig.3 respectively. In Fig. 2, it can be observed that the amount of waste in most industrial sectors were seemed to be close to each other. There were sectors, such as Electric & Gas Supply, Packaging, Cold Storage, etc., which showed that the waste amount generated by the declared registered factories was much greater than the one estimated by the JICA's study. In Fig. 3, it can be observed that the amount of waste in most provinces were seemed to be close to each other. There were provinces, such as Prajinburi and Rayong in North-Eastern region, which showed that the waste amount generated by the declared registered factories were much greater than the ones estimated by the JICA' s study.

The waste unit of Thailand were compared with the ones of China andJapan as shown in Table 2. Table 2 showed that the distribution of generated waste by industrial sector of Thailand was similar to the one of China. However, unit waste of 2 industrial sectors of Thailand Production and Supply of Electric power, Steam and Hot Water, and Building Materials and Non-Metal Mineral Products, were far less than the ones of China. This indicated that waste data in Thailand might not cover these 2 industrial sectors.

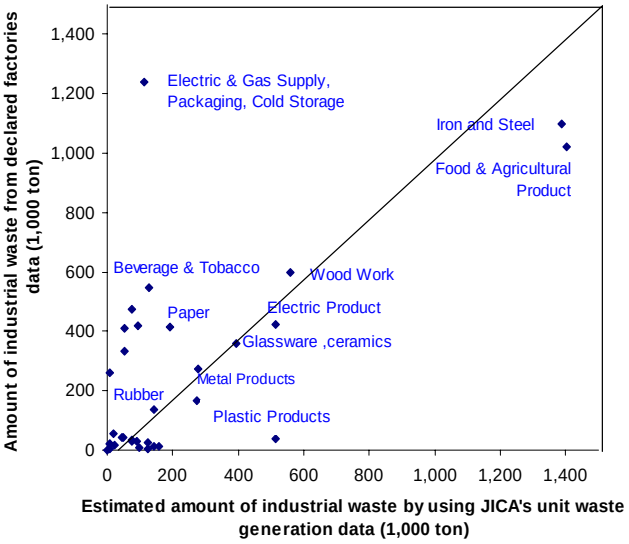

Fig. 2 Comparison of industrial waste generation by 33 industrial types

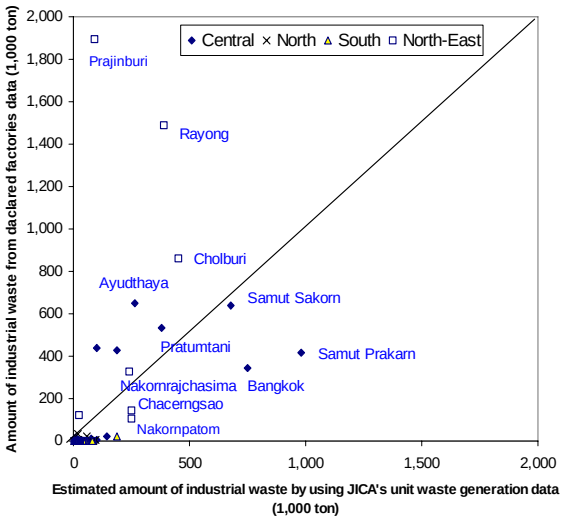

Fig. 3 Comparison of industrial waste generation by 76 provinces

4. Discussions on Data Reliability

This study was conducted to evaluated the reliability of Thailand industrial waste data by comparing MOI industrial waste data and JICA's sample survey data, and by comparing unit waste generation between Thailand and China.

Although only 4.49% of factories declared their waste treatment plan to MOI, the amount of industrial waste generation obtained by MOI was similar to JICA's sample survey data or even larger than that. And also, unit waste generation was similar between Thailand and China besides the industries of electric power generation and building materials. It means that the reason why the declaration percentage of Thailand companies waste treatment plan was so small. Most of the annual waste generation were less than 1 ton, and the small declaration percentage does not mean the companies ignored submit declaration.

Table 2 Comparison of Unit Waste per Output Production

Unit Waste, gram/US$

Input Sector	Thailand	China
Foodstuff	47	79
Textile, sewing, leather and furs products	16	10
Production and supply of electric Power, steam and hotwater	103	1,760
Coking, gas and petroleum refining	---	700
Chemical industry	16	23
Building materials and Non-metal Mineral products	56	2,089
Metal products	75	184
Machinery and equipment	11	16
Other manufacturing	40	489
Average unit waste	29	306

5. Reference

1) JICA, The Study on Master Plan on Industrial Waste Management in the Bangkok Metropolitan Area and its Vicinity in the Kingdom of Thailand (2002).
2) Statistical Year Book in China, 2004.