



The Influence of Sound Material Society in Thailand

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Abstract— *The concept of sound material cycle society (SMS) has influenced waste management technologies and 3Rs (Reduce, Reuse and Recycle) in Thailand. However, there is empirical evidence that asserts the profound impact and cultural transference of SMS on the mainstreaming of 3Rs into policies and practices in the country. This study aims to present evidence of the influence of Japan's SMS to mainstream solid waste management (SWM) practices in Thailand. The research applied a combination of exploratory and descriptive type of research - key informant, questionnaire survey, expert judgment and case study approach. During the last ten years, influences of SMS from Japan have been reached to multilevel of the Thai administrative system - national government policies, local administration's practices, and project initiatives through evidences of financial, knowledge, and technology transferred. The technical knowledge and know-how transfer in waste management was the most discussed topic among the private and public organizations. However, the financial support and technology infrastructure from Japan were challenged by local authorities and led to unsuccessful project due to know-how limitations of local staff. It can be recommended that knowledge and skill transfer from Japan-SMS practices should be enhanced in Thai's policies and practices to support sustainable 3R and SWM.*

Keywords— Financial, Japan, Knowledge transfer, Solid waste management, Sound material recycle.

1. INTRODUCTION

Resource efficiency concept has been created to address the world's challenges, including waste management by turning waste to resources. This concept means reducing the total environmental impact of the production and consumption of goods and services, from raw material extraction to final use and disposal [31]. Consequently, the Sound Material-cycle Society (SMS) was adopted in June 2000, and is a fundamental law in Japan, which aims to promote society where the consumption of natural resources is minimized and the environmental load is reduced as much as possible, by restraining products, etc. from becoming waste" [28]. SMS strives for resource efficient economy (material society); wherein, greater resource efficiency is being achieved by reducing consumption and waste of material, and by reusing and recycling by products at local, regional and national level. Since its introduction in Japan, SMS has spread all over parts of Asia and the world through the country's "Vision of a Sound Material Cycle Society in

East Asia". It has promoted policy dialogues and 3R strategies in the region through bilateral cooperation with various East Asian countries, including Thailand.

Japan had funded a lot of projects that promoted good solid waste management (SWM) technologies and practices in Thailand. It might have directly and indirectly influenced the knowledge transfer in SWM that is being practiced in many private and public organizations in Thailand. (e.g., national and local government officers, NGO, academicians, training facilitators, community organizers, and have at one point received training on SWM, conducted research on SWM.

The main objective of the study is to empirically present evidence of the influence of Japan's sound material-cycle society to the mainstream SWM practices in Thailand. The secondary objective is to quantify these influences, whether in terms of the SWM projects initiated/developed through Japan, number of individuals/organizations trained, and money spent, and quantifiable inputs and contributions. Finally, the research would also provide qualitative validation through case studies of select SWM practices. Concepts from Results-based Management (RBM) would be used follow/track these 'influences' through indicators for project outcomes. In this regard, the research would like to determine the potential knowledge and cultural transference to one of its biggest trading partners and donor recipients, the Kingdom of Thailand of sound material cycle society that Japan has promulgated through its law more than a decade ago.

2. LITERATURE REVIEW

Sound Material-Cycle Society

Sound Material-Cycle Society (SMS) means a society in which the consumption of natural resources will be

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conserved and the environmental load will be reduced to the greatest extent possible, by preventing or reducing the generation of wastes, etc. from products, etc., by promoting proper cyclical use of products, etc. when these products, etc. have become circulative resources, and by ensuring proper disposal of circulative resources not put into cyclical use [12]. SMS has been introduced initially by Japan and now this concept holds importance around the globe. The fundamental definition of SMS has been provided by the Japanese law in its fundamental law adopted in June 2000 to establish a SMS as shown below.

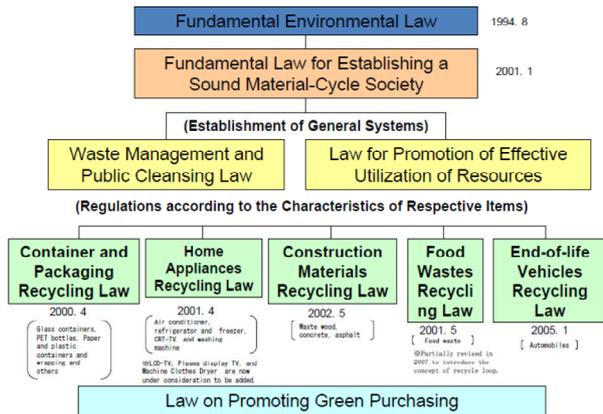


Figure 1. Legislative Framework of Sound Material-cycle Society

Program Evaluation

Dale defines evaluation, in the context of development work, as mostly a more thorough examination than monitoring, as specified points in time, of the program, projects or organizational performance, usually with emphasis on impact for people and commonly also relevance, effectiveness, efficiency, sustainability and replicability [7]. Evaluation of development programs and projects is basically about describing, judging and explaining what has been performed, what has been achieved and, commonly, what future prospects or options may exist.

Under the concept of Results-based management (RBM), an indicator for evaluation should be specific, measurable, available/achievable in a cost effective way, relevant for the programme, and available in a timely manner (SMART). It is considered to use for evaluate the change from the development project since it looks beyond output results. Mier explains RBM is an approach of management that shifts the government from inputs, activities and outputs to outcome achievement [11]. Troschinetz, A.M. and Mihelcic, J.R. defined RBM as a management approach focused on achieving results, a broad management strategy aimed at changing the way agencies operate, with improving performance (achieving results) as the central orientation [27].

A case study was another evaluation tool being used for elaborating influential evidences. A researcher may investigate one or two cases or compare a limited set of cases, focusing on several factors. Case study uses the

logic of analytic instead of enumerative induction [26]. The case studies help researchers connect the micro level, or the actions of individual people, to the macro level, or large-scale social structures and processes [34]. The logic of the case study is to demonstrate a causal argument about how general social forces shape and produce results in particular settings. The distinctive need for case studies arises out of the desire to understand complex social phenomena. The case study method allows investigators to retain the holistic and meaningful characteristics of real-life events – such as individual life cycles, organizational and managerial processes, neighborhood change, international relations, and the maturation of industries [34].

Waste Recycling Practices in Thailand

The total waste generations in Thailand reached 15.03 million tons, of which 3.45 million tons or 23% of total waste were recycled [18]. The amount of 3.08 million tons (89%) which comprises of glass, paper, plastic, ferrous and aluminum have been encouraged by various recycling activities such as purchase of junk, buy back center, and school recyclable banks, community recyclable banks, returning waste packaging to the upstream sources and so on. Solid waste was delivered to 0.25 million ton (7%) for biogas and organic fertilizer production, and 0.13 million ton (4%) was applied for generating electricity and alternative fuel [18].

There are several recycling activities/ programs being implemented in Thailand, which are categorized into different models according to its function i.e. a community-based recyclable bank, a school recyclable bank, material recovery facility, composting facility, and so on. The Pollution Control Department (PCD), a government agency, has set up the national plan which focused on the sustainable consumption of the natural resources and the application of the ‘cradle to cradle’ concept, including control of waste generation at sources, increase on waste segregation and enhancement of waste utilization efficiency prior to the final disposal [17]. The targets of waste minimization in this plan are to have the waste reduction scheme, to have the waste segregation system for reuse and recycling in every community over the country, and to minimize 30% of total waste generated.

3. METHODOLOGY

The research utilized a combination of exploratory and descriptive type of research. Key informant interview, questionnaire survey, and case study approach were used to provide empirical evidences on how Japan’s sound material-cycle society influenced Thailand’s current solid waste management systems and practices. The study characterized the magnitude and impacts of projects implemented Thailand’s SWM practices influencing from Japan, directly and indirectly. A case study approach was applied in the research to explain in-depth details of essential elements. These were good practice cases representing different levels of SWM programs (national, regional, local level of implementation).

As for identification of successful SMS-related project/program for case study, an expert consultation meeting was organized to identify the cases. There were four cases selected as representatives of community level, informal sector, municipality (or local administration level), and technology driven projects.

Primary data collection techniques were used during the five-month data collection period to gather evidences of influential impacts from Japan as follows.

- Key informant interview: an in-depth interview with a semi-structure checklist was conducted to the key informants. From the selected case of Japan-SMS projects, the sample size was chosen by considering the primary stakeholders and implementers of the Japan-SMS practices in Thailand. The purposive sampling technique was used. They are 4 SWM policy makers, 2 government planners, 4 officers and technicians on solid waste management, 6 local implementers and NGOs, and 2 private company dealing business with SWM. Expected data from this technique was in-depth information on current stage of project implementation, progress against baseline that was influenced by the SMS concept, service to beneficiaries, and policy execution.
- Focus group discussion: it was organized with primary stakeholders, composing of 3 implementers of Phitsanulok Municipality, 9 primary stakeholders of Pravet District of BMA, 9 project stakeholders from Phuket Municipality, and 7 implementers and policy makers from Nonthaburi Municipality. This technique was principally to obtain information on local knowledge and to motivate local implementers on SWM to express their ideas, knowledge, and experiences to gain insight of the SWM performance at local level.
- Expert judgment: it was arranged with the 6 experts, from environmental government agencies, private sector, NGOs, and academia. in a form of roundtable discussion allowing expertise in SWM-related area to actively participate in an expert consultation meeting
- Questionnaire survey: it was applied to 25 local authorities that were influenced by Japan's initiatives in order to obtain beneficiaries' perception on the Japan's influential evidences of SWM practices in Thailand.
- Observation: participatory and non-participatory observations were used to gather information from the real places.

Secondary data collection was utilized to obtain supporting evidences on the Japan-support programs and projects in Thailand. It was also used as references for further information on case study and data analysis. These included the official statistics and documentations, publications, papers, journal articles, reports, etc.

Data analysis was based on quantitative and qualitative research approach. Specific analytical methods for this research were statistical analysis and content analysis.

The results obtained from each data collection technique and from different group of key informants did support into the same way for data analysis.

4. RESULTS AND DISCUSSIONS

4.1 Development of Performance Assessment Indicators

Performance indicators are considered as an important tool to measure level of influence from Japanese initiatives to Thailand practices. Expert judgment was applied to identify development indicators systematically. The main objective of this expert consultation meeting is to identify key performance indicators (KPI) for evaluating success, in terms of sustaining SMS principles, sustaining and out scaling, SMS-related projects that has been implemented in Thailand with the assistance of the Government of Japan, through technical assistance, technology and knowledge transfer, capacity building, financial support, and/or through other means.

The results show that there are 5 KPIs suitable for assessment of the successful SMS-related project/programs in Thailand. The five KPIs were developed as major indicators to assess successful SMS-related projects/programs in Thailand. They are as follows.

1. Level of awareness: to measure a body of knowledge and understanding on SWM/3R were taken into implementers/ beneficiaries' consideration and practices
2. Local participation: to know level of local people involvement to the project/programs
3. Policy support: to realize to what extent and how the local policy statement on SWM/3R were taken into account
4. Number of collaboration: to understand the phenomena of networking and its benefits to the project/programs
5. Replication/upscaling: to assess the level of achievement and its impacts of SMS-related project/programs influence

4.2 Japan's Influential Evidences On Mainstreaming SWM Practices In Thailand and Quantification Results

The adoption of SMS concept manifested in different ways, such as policy statements from the central government, integration of strategic planning to local authorities, application of 3R concepts into business plans and CSR (Corporate Social Responsibility) programs, social advocacies on SWM led by NGOs and local institutions, and household level practices. This only infers that SMS is now generally accepted and practiced into every level and sector of the society – from public, private, civil organization, as well individuals. At local level, SMS concept has been addressed into local-based waste minimization and recycling i.e. School Garbage Bank, Community-Based Solid Waste Management in many municipal areas. A review of 3R-related projects in Thailand revealed that

there are initiatives supported by the Japanese Government. Out of this, 18 are still ongoing and 14 have already concluded. Among those 32 implementing projects, there were 20 technology transferred and SWM implementing projects, 6 pilot models for sustainable environment cities, best SWM practices and recycling, and 6 dissemination of knowledge in type of training program, toolkit, learning center, and meeting.

Based on the survey, it was found that respondents, who are supported by Japanese-fund projects, can be categorized by 2 groups – Tambon (Sub-district) Administrative Organizations and Municipality Offices (including large, medium, and small scale). The overall situation underlying Japan-supported initiatives was also measured by perceptions of those respondents. It was found out that majority of respondents satisfied on 'increasing the level of awareness to 3R principles of the beneficiaries', following by 'funding amount' which is equal to 'reinforcing existing 3R and SWM policies, and 'encouraging effective local participation' - accounting for 98.9%, 95.6% and 92.2% accordingly. For overall quality of Japanese-supported initiatives, it was quantified by respondents at a high level of satisfaction, which is accounted for 97.8% satisfactory perception.

Majority of the SWM project supported (directly and indirectly) by the Japanese government are project implementation type of activities (66% of respondents). Through funding advertisement channeled by Ministry of Natural, Resources and Environment, the local authorities have been encouraged to develop a proposal related to environmental management development. Project implementation type of activities is the most popular topic as it was drafted based on the challenges of existing environmental pollution problems. SWM is one of those issues. It is also enhanced effectiveness of the municipal SWM plan in a compatible approach. There are also knowledge transfer types of projects, trainings and MRV.

4.3 Assessment Of Specific Case Studies

The four case studies demonstrate the level of penetration of SMS-related activities in Thailand, from municipal level SWM to community-based SWM to informal waste picker groups. The four cases received a variety of assistance from Japan ranging from financial and technical assistance, knowledge and technology transfers and knowledge sharing partnerships.

In Phitsanulok municipality, the Community-based Solid Waste Management (CB-SWM) concept was applied into two pilot communities; Charn Vejakit and Dee-In Pattana. They promoted waste separation program and learning center. The promotion is usually done through community meetings held once a month, door-to-door service, and word of mouth. They also established a learning center, which allowed local villagers to view demonstrations of waste separation, waste minimization, and waste utilization.

As for Waste Picker Group in On Nut 14 Rai community, BMA, the knowledge transfer partnership between the community and Japan began when a Japanese group made a study visit to the area. The leader of the waste picker organization arranged a small

workshop where both parties exchanged ideas, knowledge and skills on waste separation and other waste recovery techniques. This exercised helped the organization members to realize the value and effectiveness of their work and also enhanced their waste collection practices and techniques. The organization also benefited from a training course on organic waste management conducted by Japanese volunteers from Fukuoka to Praveet District officers.

For Phuket Municipality, the city was also a recipient of at technical assistance program from JICA in 1992. The program provided strategic planning for municipal solid waste management and wastewater treatment. This was accomplished through financial and technical knowledge support. After the technical assistance project concluded, the Civil Engineering Division of Phuket Municipality took the responsibility over the implementation and continuation of the strategic planning.

In Nonthaburi Municipality, there are several types of Japan-supported projects and activities that involved the municipality's SWM. One of those was initiated by Kitakyushu. Since 2002, Kitakyushu funded, through UNESCAP, the municipality 5,000 USD to run the pilot project on waste minimization and utilization (3R) program. The project implementers also made a study visit to Japan in order to obtain real experience for applying relevant technique and knowledge to the municipality. The other projects that were funded by a Japanese agency included (1) a foam waste management project, initiated by Japanese volunteers, which aimed to reduce amount of foam waste in the municipal landfill; (2) the adoption of *Takakura* method, a composting technique used inorganic waste management; and (3) the participation of the city to the Kitakyushu network and the concurrent study visit on related SWM issues in Japan.

Among the valued factors the stakeholders believe helped their programs and projects reach success are social capital, technical capacity building, partnerships and continuous support from the local government agency. The key assessment results of the four case studies are summarized in Table 1.

4.4 Discussions

The study reveals that there are five major components that Japan-SMS positively influenced to SWM programs/projects in Thailand. First is to be attentive and try to utilize the social capital and local wisdom. Second is stakeholders' involvement. Enhancing people participation is a major tool for mobilizing local resources in operating the project. Third is partnership collaboration to help facilitate communication, technical assistance and makes possible to reach the project goal. Fourth is technical support, including financial, technical knowledge, and technology, especially from the expertise on SWM and 3R management. The last is regular monitoring and evaluation, providing systematic working progress and effective project management.

Table 1. Summary of case studies influenced by Japan-SMS initiatives and relevant factors contributing to the success

Cases	Influenced Japan-SMS initiatives	Factors contributing to the success
CB-SWM project in Phitsanulok municipality	Financial and Technical knowledge support on Community-based Solid Waste Management	<ul style="list-style-type: none"> - Regular monitoring - Provision of technical knowledge and information - Technology know how transfer - Implementing pilot project prior to conduct full operation is strongly suggested - Social capital utilization
Scavenger Group in On Nut 14 Rai community, Pravet District Office of BMA	Technical knowledge on waste separation support on Zero Baht Shop and scavenger group management	<ul style="list-style-type: none"> - Attitude of working with waste separation and management - Social capital recognition and utilization - Partnership collaboration - Budgeting allowance - Regular monitoring and evaluation
Phuket Municipality	Technical knowledge support on Incineration plant of waste to energy and upscaling to environmental conservation club in Phuket town	<ul style="list-style-type: none"> - Social capital is a good asset of working participatory SWM - Effective local administration operation - Simple and easy technology transfer - Develop working network
Nonthaburi Municipality	Financial and Technological support on Takakura method (organic waste composting), foam management project, Kitakyushu on municipal solid waste management	<ul style="list-style-type: none"> - Municipal policy continued on SWM support - Clear responsibility of municipal staff to SWM/3R duty - Budgeting support - Community participation - Capacity building of the officers

The national policies and plans on SWM have been recognized as a mainstreaming 3Rs into various target groups such as individual encouragement through

separate-colored bins, integrated MSWM (Municipal Solid Waste Management) system, community-based solid waste management (CB-SWM) by promoting annually the national CB-SWM Best Practice competition, informal sector by way of enhancing vagrant scavengers into a conventional recycling business. The process of implementation basically involved both public and private sector. Initiatives of Japan-SMS is generally applied into those mentioned practices through collaboration projects with Japanese donor agencies i.e. JICA, ADB, IGES, etc.

5. CONCLUSION AND RECOMMENDATIONS

It was found from the study that the influences of SMS from Japan have been reached to multilevel of the Thai administrative system during the last ten years. This can be categorized into national government policies and plans; local administration’s regulations and practices; and project initiatives. There have been three major categories of Japan influencing evidences on SMS in Thailand - financial, knowledge, and technology. The results also show that Japan-influenced technical knowledge and skill transfer in waste separation and management is the most discussed topic among private and public organizations. It enhanced strategic SWM planning and effective implementation to 3R programs. The knowledge transfer from Japan is usually channeled through training course, technology infrastructure, funding, documents and websites. However, it was found in some cases that financial support and technology infrastructure supported by Japan caused difficulty to local officers and led to unsuccessful project due to limitations on technical capacity of local staff.

Recommendations can be made to the SWM organization and government agencies, and for future research study. For SWM organization and government agencies, in order to achieve the zero waste management schemes, the development planners and practitioners on SWM and 3R can explore more Japan-SMS practices and consider adopting some useful and suitable knowledge to apply into existing organizational plans and programs. Moreover, donor agencies or related SWM organizations can apply findings of the influences in terms of financial, technical knowledge and technological aspects to consider resource allocation and administration to these types of assistance under the sustainable SWM scheme. As for future research study, the researcher, academia, and development professionals may also apply the research results, particularly on factors contribution to the success, as a baseline data when replicating or upscaling SWM/3R projects are taken into account.

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