

SOCLEAN Model: A Model for Community-based Solid Waste Management of Local Government in the Northeast Region of Thailand

Pissadarn Saenchat¹, SanyaKenaphoom^{*2}

¹SakonNakhonRajabhat University, Thailand

²RajabhatMahasarakhamUniversity, Thailand

ABSTRACT

Solid waste is a very serious problem for communities, and waste management has evolved over and over until the mission of waste management has fallen into the responsibility of the local government. The objective of this article is to synthesize an effective waste management model with cooperation from the public sector. The result found that the effectiveness model of community-based solid waste management (CBSWM) of Local Government in the Northeast Region of Thailand called "SOCLEAN Model" which consists of 7 elements, there were: Strong Policy - S; Organization Management-O; Contributing Context-C; Learning how to success-L; Education for stakeholder-E; Activities of CBSWM- A; and Networking-N. This model was appreciated for operation applying of local government for reducing the amount of local solid waste; promote the people to reuse solid waste; and making participation and satisfaction of the people on local Solid Waste Management.

Keywords:

Community-based Solid Waste Management

Introduction

The Thai government under the National Council for Peace and Order has made solid waste management a national agenda by issuing the Prime Minister's Office Regulation on the Organization of the National Solid Waste Management System **2014** on **19 September 2014**. And set a Roadmap of Solid Waste and Hazardous Waste Management on August **26, 2014**, with **4** steps consisting of (Government gazette. **2014**) **(1)** Residual waste must be handled out of open pits, improperly managed litter boxes, need to be explored, improved and law enforcement. **(2)** Provide a new type of waste management which has to reduce waste production and sort out solid waste from the source, have centralized waste management using integrated technology focus on converting to renewable energy or making the most of it. **(3)** Establish regulations to support the management of solid waste from the process of separation, storage, transportation, transport, to disposal and **(4)** Creating a discipline of people in the nation to educate and enforce the law, by assigning the governor to manage the waste and hazardous waste in the area, and has appointed a provincial committee to stimulate various agencies to be alert and cooperate to solve the problem of solid waste in an integrated and concrete way (Pollution Control Department, **2014**) The management of municipal solid waste is a duty of the local government in accordance with Section **18** of the Public Health Act **1992** and in Section **20** (Government gazette. **1992**) has determined that the local government has the power to issue local regulations on the following matters; **(1)** It shall not be transferred, disposed of, or made to be made in a public place or way where sewage or waste other than that provided by the local government. **(2)** Prescribing that there be a receptacle for sewage or solid waste in a public place or way and in a private place. **(3)** Prescribing methods for collecting, transporting, and disposing of sewage or solid waste, or allowing the owner or occupant of any building or place to comply with the hygiene or use of that building or place; and **(4)** To determine the rates of service fees of the local government for the collection and transport of sewage or solid waste not exceeding the rates prescribed in the Ministerial Regulations.

Effective solid waste management must be managed from the source, the local government must campaign to promote people to sort solid waste and reduce the amount of solid waste at the origin at the household level or at the individual by using the **3Rs** principles as follows: **(1)** Reduce is the reduction of waste by reducing the use of waste packaging products, **(2)** Reuse is reuse, and **(3)** Recycle is the transformation and recycling to reduce The amount of solid waste is minimized, prior to disposal, high-quality waste materials are sorted for reuse or processing.

In addition, education and awareness are given for the public to understand and accept that it is their own obligation to manage waste less until there is no waste called "Zero Waste". In **2004**, the zero waste management concept was applied to the Phitsanulok Municipality and created an important approach, Community-Based Solid Waste Management: CBSWM, That is, the management of solid waste at the source, with communities and households to work on improving waste management in a positive way in order to reduce the volume and to make the most of waste separation, which uses **6** main measures, consisting of **(1)** sorting for sale, **(2)** organic waste composted, **(3)** manage their own trash, **(4)** trash-free roads, **(5)** reduce the frequency of garbage collection, and **(6)** Pay the fee (Phitsanulok City Municipality, **2009**).

Later, community-based solid waste management concepts and practices were expanded to various localities throughout the country, with many municipalities and sub-district administrations undertaking various forms of community-based solid waste management activities such as a waste bank, composting, biogas making, crafting appliances from waste material, etc. however, these are merely the implementation of certain activities in accordance with the local understanding and context of the community, without a clear systematic conclusion. Therefore, this paperwork is interested to synthesize knowledge on solid waste management by participating communities in order to see the basic principles as well as effective waste management processes. The results of the study can be applied to benefit the local community and especially the local government organization, which is the agency directly responsible.

Research Objective

This article aims to present a community-based solid waste management model and application of model for community-based solid waste management of local government organizations in Thailand

Literature Reviews

The SOCLEAN Model is a model for effective community-based solid waste management in the Northeast of Thailand that emerged from the research on "Community-Based Solid Waste Management Model Development of the Northeastern Municipality of Thailand" which studied and transcribed the lessons of solid waste management of the community, a good example that had won the first prize from the project of the waste-free community and the waste-free community in honor of the national level of the Department of Environmental Quality Promotion, Ministry of Natural Resources and Environment, totaling 4 communities; (1) HuaThanon Community, Phra Lap Sub-District Municipality, KhonKaen Province (the winner of the Large Community category, the 88th Anniversary of the Waste-Free Community Project, the 88 Community of the Year 2015). (2) NongChod Community, Non-Daeng Sub-District Municipality, NakhonRatchasima Province (the winner of the Medium Size Community category, the 88th Anniversary of the Waste-Free Community Project, 2015). (3) Phone Daeng Community, Na KaeSubdistrict Municipality, NakhonPhanom Province (the winner of the Small

Community category, the 86th Anniversary of the Waste-Free Community Project, the 86th Community of the Year 2013). (4) Ban Mai Community, PhangKhonSubdistrict Municipality, SakonNakhon Province (the winner of the 2009 waste-free community category). The study and transcription of these 4 community lessons, combined with the study of solid waste management conditions of 276 municipalities in the Northeast, resulted in a community-based solid waste management model with 7 components: Strong Policy, Organization Management, Contributing Context, Learning how to success, Education for stakeholder, Activities of CBSWM, and Networking. It is called "SOCLEAN Model" (PissadarnSaenchat et al, 2017).

During February and July **2016**, the SOCLEAN model was used at Buntharik Sub-District Municipality, Buntharik District, UbonRatchathani Province found that it can reduce the amount of municipal solid waste that has been discarded and there is more solid waste that will be recycled (PissadarnSaenchat et al, **2017**). And later in the year **2017-2018**, it has been applied to the municipal solid waste management operations at Na Pho Sub-District Municipality and Ban Mad Sub-District Administrative Organization, Buntharik District, UbonRatchathani Province, found that the public participates and is satisfied with the waste management of the local government organization, resulting in a good reduction of the amount of solid waste at the source (PissadarnSaenchat et al, **2018**). Therefore, the SOCLEAN Model is a community-based solid waste management model that local government organizations in Thailand can adapt to suit the context of each area, which can help reduce the amount of solid waste of the community, people will know how to use organic waste, recycle waste to add value, bringing general and hazardous wastes to be disposed of in a better systematic way than they are, which will result in cleanliness and order in the community, which will create the participation and satisfaction of the people and related sectors, it will also save the budget for the collection, transport and disposal of the waste at the destination of the local government organization.

Research methodology

This research is a synthesis of a municipal solid waste management model in the northeastern region of Thailand that has studied and transcribed the lessons of solid waste management of four sample communities, including a study of solid waste management status of 276 municipalities in the Northeast. It was then used to create a community-based solid waste management model called SOCLEAN Model. It was tested in the sample area and found that the model was effective in making the waste management of the local government to be economical and consistent with the people's lifestyle, which later, the SOCLEAN Model was published to various localities, giving the local government organization principles and guidelines for the implementation of community-based solid waste management more effective and more appropriate to the context of the area.

Research Results

Application of the SOCLEAN Model in Solid Waste Management by the Community of Local Government Organizations. Every local government organization can apply the principles of a community-based solid waste management model "SOCLEAN Model "can be applied to suit your local self as follows;

1. Strong Policy- S: Having a strong policy will help prevent and correct errors in the organization, enabling consistent and clear operations, and enable more efficient use of limited resources (AICPA, 2021). To have a strong policy for community-based solid waste management, it must start with the local administrative organization administrators to make this policy a priority, then forward it to the formulation of strategies, planning of actions with the

community, and there is always monitoring, evaluation and improvement of the work, the principle of operation is as follows.

1.1 the local government must have a clear policy to focus on the management of solid waste by the community.

1.2 The local government organization must have a strategy for community-based solid waste management.

1.3 The local government must establish regulations on the management of solid waste.

1.4 The local government organization must have a community-based solid waste management project plan.

1.5 Local government organizations must have a planning meeting with communities to sort and utilize solid waste, organize trash, and make trash-free roads.

1.6 Local administrators must regularly monitor and listen to problems of solid waste management in the community.

2. Organization Management- O: Organizational management is the relationship between individual and functional areas into effective functional units, in order to achieve goals (Flippo, 1970). In managing the organization for the management of municipal solid waste, the local government organization must establish a structure of assignment for persons who are ready to work both from the local government organization and the community, and there is a support for the work budget, which should be done as follows.

2.1 There is a community working group that is responsible for planning, supervising, or facilitating the management of solid waste.

2.2 Budgeting, equipment, waste collection trucks, adequate service, and good use.

2.3 There is clearly divided the structure of duties for the community solid waste management working group with sufficient capacity.

2.4 Good municipal solid waste collection, punctuality, and no litter.

3. Contributing Context- C: Refers to conditions or environments that occur both within and outside the organization which has an impact on the activities and personnel of that organization (SaovalakKosonkittumporn2005:4). The practice of dealing with community issues depends on the context of the problem, community leadership, leadership vision, management vision, and the integration of community ideas to properly address community issues (TassaneeLaknapichonchat, 2002). By providing the context of the area both within the local administration organization and in the community to facilitate the management of solid waste by that community. The local government organization must find ways to make the employees of the local government organization, community leaders, and people ready and cooperate to carry out the following tasks:

3.1 Provide morale to employees who participate in the management of solid waste with the community.

3.2 Find and promote groups of people who are interested and ready to cooperate with local government organizations in sorting and reusing waste.

3.3 Support and empower strong community leaders to have knowledge and understanding and to be a good example in the separation and use of solid waste.

4. Learning how to succeed- L: Refers to behavioral changes as a result of the experience people interact with the environment or through practice (SurangKowatrakul, 2007). To successfully manage solid waste by the community, the local government must learn from successful people and apply them to their own context.

4.1 Arrange for the public to study and visit work on the management of solid waste by the community.

4.2 Organize activities to stimulate and inspire people to exchange and learn about solid waste management by communities with other communities or other organizations.

4.3 Arrange for a community meeting or meeting to bring what gained from study, work visit, or exchange of knowledge to do community-based waste management activities.

4.4 Do assessments, transcribe lessons, follow up on news, learn more about community-based solid waste management and report results to stakeholders on an ongoing basis.

4.5 Establish a learning center for community-based waste management.

5. Education for stakeholders- E: Knowledge is a very valuable resource for any organization, divided into Tacit Knowledge and Explicit Knowledge. The organization can gather knowledge scattered in the person or corporate document to develop it into a system so that everyone in the organization can access knowledge and develop themselves to be knowledgeable, as well as work effectively with Knowledge Management. This can be performed in **4** steps which are; Defining the scope of knowledge issues to be managed, Creating or seeking the knowledge that is needed, Processing and filtering of knowledge gained from knowledge management, and setting up a forum for sharing and exchanging knowledge together (Rangsit University, **2017**) However, for the creation of organizational knowledge in community-based solid waste management for stakeholders, it is imperative that the local government organization analyzes the stakeholders and how to acquire knowledge should proceed as follows:

5.1 Allowing people to gain knowledge on solid waste management by the community through a meeting, clarification, or training.

5.2 Allowing people to gain knowledge on solid waste management by the community through public relations such as distributing knowledge sheets, brochures, news distribution towers, etc.

5.3 Allowing people to gain knowledge from awareness-raising activities or promoting participation in waste management at the source.

6. Activities of CBSWM-A: Community-based solid waste management is a toolkit for decision-makers, especially municipal employees, household members, and communities, which, as a whole, are used to improve household solid waste management. Therefore, the management of solid waste by the community consists of **6** steps: Sales management, organic waste composting, own waste bin management, trash-free roads, reduced waste collection frequency, and waste payment (Department of Environmental Quality Promotion, **2019: 11**). Community-based solid waste management activities can be carried out in many ways, starting with activities that interest the public and then expanding to other activities, which should be done as follows:

6.1 Encourage people to reduce waste generation based on the principle of less use, reuse, and recycling.

6.2 Encourage households to sort food waste and not mix it up with other types of waste and then use food waste, leaves, grass to compost, raise animals, or make biogas.

6.3 Encourage households to sort out the garbage they sell and sell.

6.4 Encourage communities to do community waste banking activities to collect the garbage that can be sold.

6.5 Encourage households to separate hazardous waste such as Light bulbs, batteries, chemicals, phone batteries Etc., and make clear appointments for sanitary disposal.

6.6 There are roads that are trash-free or have general garbage pickup points that are not obstructing traffic.

6.7 Encourage communities to set rules for the management of solid waste such as garbage sorting, hazardous waste collection schedule, general waste collection time, foam-free traditions, etc.

6.8 make an understanding of the public for cooperation in the payment of waste management fees according to the provisions of the local government organization.

7. *Networking- N*: Refers to a group of people, organizations with common goals, who come together voluntarily to carry out activities in achieving a goal (Think together, make plans, join together, make assessments), by having a horizontal relationship, equality, and continuing to learn together, in collaboration with other agencies or organizations in a networked manner, there are levels of cooperation, namely Coordination, Cooperation, Collaboration, Participation (JeerawitMunkongwattana, 2019). For community-based solid waste management network partners, both within and outside the community, the local government organization must seek cooperation in the implementation along with the promotion of the people, which should do the following:

7.1 Coordinate with other government agencies in the area of the local government organization to carry out activities for waste separation and recycling.

7.2 Clarification and request for the cooperation of shops in the local administrative organization area to do or support activities for waste separation and reuse.

7.3 Coordinate and support schools in the local administrative organization to carry out activities for waste separation and recycling.

7.4 Coordinate to seek help from the private sector or academic institutions or other organizations to support the community solid waste management activities of the local government organization.

Conclusions and recommendations

The SOCLEAN Model is a synthetic, community-based solid waste management model based on research on “Community-Based Solid Waste Management Model Development of Municipalities in Northeastern Thailand” Obtained by studying and deciphering lessons on solid waste management of four good sample communities, together with a study of solid waste management conditions of **276** municipalities in the Northeast, it is then used to create a pattern with **7** components: Strong Policy-S, Organization Management-O, Contributing Context-C, Learning how to success-L, Education for stakeholder-E, Activities of CBSWM-A, and Networking-N.

When applied to trial in the sample area, it was found that the waste management of the local government organization could be effective, which could reduce the amount of solid waste that the local administrative organization collected and transported, and the rate of solid waste to be recycled for the benefit of the community increased. The local residents are increasingly involved in municipal solid waste management, resulting in cost savings in solid waste management, and people are more satisfied with the local government's solid waste management. It can be summarized as a diagram as follows;

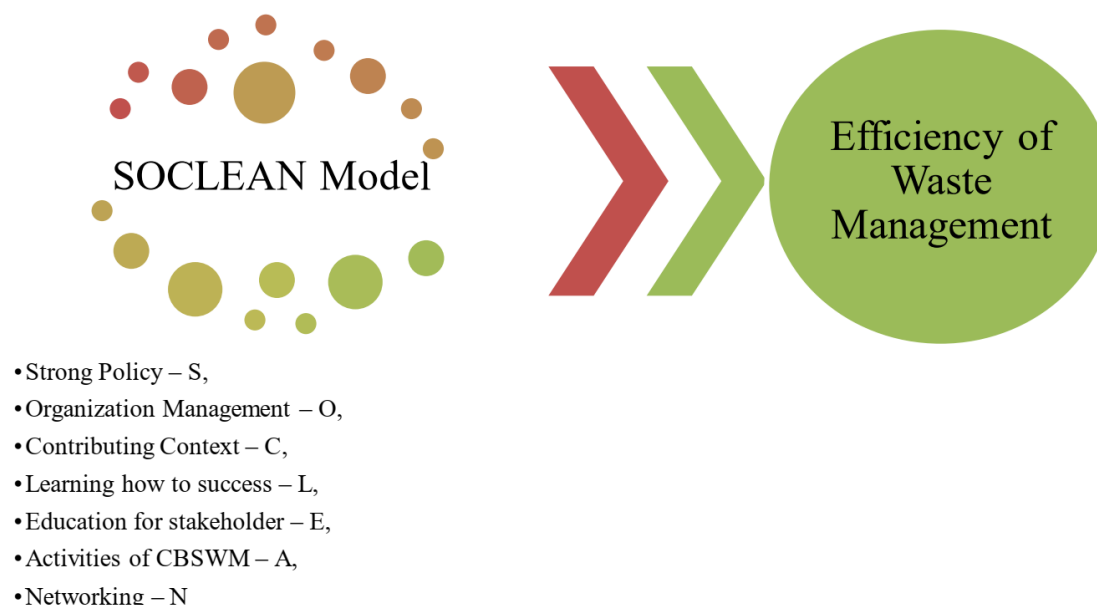


Figure I: SOCLEAN Model for Community-based Solid Waste Management of Local Government in the Northeast Region of Thailand

References

- [1] AICPA. (2021). Strong policies make for effective boards. [Online] <https://future.aicpa.org/resources/article/strong-policies-make-for-effective-boards>. (2 February 2021)
- [2] Department of Environmental Quality Promotion. (2019). Solid waste management by the community. Bangkok: Department of Environmental Quality Promotion: Ministry of Natural Resources and Environment.
- [3] Flipppo, Edwin B. (1970). Principle of Personnel Management. New York: McGraw-Hall Inc.
- [4] Government gazette.(1992). Public Health Act, 1992. Government Gazette Volume 109, chapter 38, date 5 April 1992.
- [5] Government gazette.(2014). Regulation of the Prime Minister's Office on the Organization of National Solid Waste Management System 2014. Government Gazette Volume 131, special section 189 n., 25 September 2014.
- [6] Jeerawit Munkongwattana. (2019). Development of Network Affiliate System.[Online] <https://www.gotoknow.org/posts/344755>. [2 February 2019]
- [7] Phitsanulok City Municipality. (2009).Model and Management of Solid Waste in Phitsanulok Municipality (Phitsanulok Model).Phitsanulok: Phitsanulok City Municipality Office.
- [8] PissadarnSaenchat et al. (2017). A Study of Solid Waste Management of Municipality in the North-eastern Region of Thailand. Humanities and Social Sciences Journal,

UbonRatchathaniRajabhat University, 8 (2): 259-275.

- [9] PissadarnSaenchat et al. (2018). The results of applying the SOCLEAN Model in Community-Based Solid Waste Management of Local Administration Organizations in the Rural Area of Buntharik District, UbonRatchathani. 2nd International and National Research Conference 2018: NIRC II 2018, BuriramRajabhat University: 1038-1047.
- [10] Pollution Control Department. (2014). Roadmap of waste and hazardous waste management. Bangkok: Waste and Hazardous Substance Management Bureau, Pollution Control Department: Ministry of Natural Resources and Environment.
- [11] Rangsit University. (2017). A handbook for creating knowledge through the process of sharing knowledge and transcribing knowledge - learning experiences. [Online] https://lc.rsu.ac.th/km/files/manual/km_manual.pdf. [20 December 2017].
- [12] SaovalakKosonkittiumporn. (2005). A study of community contexts for addressing poverty: Ban Kut Sui Community, Village No. 8, LatPhatthanaSubdistrict, Muang District, MahaSarakham Province. Mahasarakham: RajabhatMahaSarakham University.
- [13] SurangKowatrakul. (2007). Educational Psychology. 7th edition. Bangkok: Chulalongkorn University Press.
- [14] TassaneeLaknapichonchat. (2002). Community work: the ways towards empowering community. Bangkok: Thammasat University Press.