Solid Waste and Environmental Management by Emphasis on Community Participation and Integrated Network Partners in Tha Kasem Subdistrict Municipality, Muang District, Sa-Kaeo Province

การบริหารจัดการขยะและสิ่งแวดล้อมโดยเน้นการมีส่วนร่วมของชุมชนและภาคีเครือข่ายแบบบูรณาการ เทศบาลตำบลท่าเกษม อำเภอเมือง จังหวัดสระแก้ว

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Abstract

An objective of this research was to study the influence of attitudes about solid waste separation from people who live in Tha Kasem Subdistrict Municipality, Muang District, Sa-Kaeo Province on the amount of waste that needs disposal within 1 day. The research tool in this study was a questionnaire for collecting the data by using the self-enumeration method. Multiple linear regression (enter method) was used for statistical analysis. The results showed that the people who differently faced the problems of the insufficient number of bins for solid waste separation, the incorrect method of transferring separated household solid waste, the lack of understanding in household solid waste separation, the indistinct color of bin types, and the inaccessibility of public relations by related departments about the benefits of household solid waste separation, had a significant difference in the amount of organic waste that needed disposal within 1 day ($p<.05$). The people who differently faced the problems of: the insufficient number of bins for household solid waste separation; the incorrect method of transferring of separated household solid wastes; the lack of understanding in solid waste separation; the unclear message on the bins resulting in difficulty reading; the indistinct color of bin types; the inaccessibility of public relations by related departments about the benefits of household solid waste separation; and the lack of solid waste separating inducement from related departments, had a significant difference in the amount of the recyclable wastes (plastics, paper, iron, copper, and zinc), the general wastes (plastic bags and foam boxes); and the hazardous wastes that needed disposal within 1 day ($p<.05$). In addition, the understanding of household solid waste separation significantly influenced

the amount of organic and glass bottle waste that needs disposal within 1 day ($p<.05$). Therefore, educating the people about solid waste separation, inducing community participation and integrating the related departments in Tha Kasem Subdistrict Municipality may lead to a decrease in waste and environmental problems in Tha Kasem Subdistrict Municipality.

KeyWords: solid waste management, environment, community participation, integrated network partners, Tha Kasem Subdistrict Municiplaity

บทคัดย่อ

การวิจัยนี้มีวัตถุประสงค์เพื่อ ศึกษาอิทธิพลของทัศนคติเกี่ยวกับการคัดแยกขยะมูลฝอยของชาวเทศบาลตำบลท่าเกษม อำเภอเมือง จังหวัดสระแก้วที่มีต่อปริมาณขยะที่ชาวเทศบาลตำบลท่าเกษมต้องกำจัดภายใน 1 วัน เครื่องมือที่ใช้ในงานวิจัย คือ แบบสอบถาม โดยเก็บรวบรวมข้อมูลด้วยวิธีทอดแบบ (self-enumeration method) สถิติที่ใช้ในการวิเคราะห์ข้อมูล ได้แก่ การวิเคราะห์ความถดถอยเชิงพหุด้วยเทคนิค Enter ผลการศึกษา พบว่า (1) ชาวเทศบาลตำบลท่าเกษมที่พบปัญหาการมีภาชนะรองรับปริมาณขยะไม่เพียงพอในการคัดแยกขยะมูลฝอยในครัวเรือน ปัญหาการเก็บขนที่ถูกวิธีในการคัดแยกขยะมูลฝอยในครัวเรือน ปัญหาความรู้ความเข้าใจการคัดแยกขยะน้อยในการคัดแยกขยะมูลฝอยในครัวเรือน ปัญหาการแยกสีถังขยะตามประเภทไม่เด่นชัดในการคัดแยกขยะมูลฝอยในครัวเรือน ปัญหาด้านหน่วยงานที่เกี่ยวข้องประชาสัมพันธ์ประโยชน์ของการคัดแยกขยะมูลฝอยไม่ทั่วถึงในการคัดแยกขยะมูลฝอยในครัวเรือนที่ต่างกันมีปริมาณขยะอินทรีย์ที่ต้องกำจัดภายใน 1 วันแตกต่างกัน อย่างมีนัยสำคัญทางสถิติที่ .05 ชาวเทศบาลตำบลท่าเกษมที่พบปัญหาการมีภาชนะรองรับปริมาณขยะไม่เพียงพอในการคัดแยกขยะมูลฝอยในครัวเรือน ปัญหาการเก็บขนที่ถูกวิธีในการคัดแยกขยะมูลฝอยในครัวเรือน ปัญหาด้านความรู้ความเข้าใจการคัดแยกขยะน้อยในการคัดแยกขยะมูลฝอยในครัวเรือน ปัญหาข้อความบนถังขยะไม่ชัดเจนทำให้อ่านลำบากในการคัดแยกขยะมูลฝอยในครัวเรือน ปัญหาการแยกสีถังขยะตามประเภทไม่เด่นชัดในการคัดแยกขยะมูลฝอยในครัวเรือน ปัญหาด้านหน่วยงานที่เกี่ยวข้องประชาสัมพันธ์ประโยชน์ของการคัดแยกขยะมูลฝอยไม่ทั่วถึงในการคัดแยกขยะมูลฝอยในครัวเรือน ปัญหาด้านหน่วยงานที่เกี่ยวข้องไม่ประชาสัมพันธ์เชิญชวนให้เกิดพฤติกรรมการคัดแยกขยะมูลฝอยในครัวเรือนที่ต่างกันมีปริมาณขยะรีไซเคิลประเภทพลาสติก กระดาษ เหล็ก ทองแดง สังกะสี ขวดแก้ว อลูมิเนียม ขวดน้ำ ปริมาณขยะทั่วไป ได้แก่ ถุงพลาสติก กล่องโฟม และปริมาณขยะอันตราย ที่ต้องกำจัดภายใน 1 วันแตกต่างกัน อย่างมีนัยสำคัญทางสถิติที่ .05 (2) ความรู้ความเข้าใจเกี่ยวกับการคัดแยกขยะมูลฝอยมีอิทธิพลต่อปริมาณขยะอินทรีย์และปริมาณขยะขวดแก้วที่ชาวเทศบาลตำบลท่าเกษมต้องกำจัดภายใน 1 วัน อย่างมีนัยสำคัญทางสถิติที่ .05 ดังนั้น การถ่ายทอดองค์ความรู้แก่ประชาชนเกี่ยวกับการคัดแยกขยะมูลฝอย การกระตุ้นให้เกิดการมีส่วนร่วมของชุมชน และการบูรณาการหน่วยงานภาคีเครือข่ายที่เกี่ยวข้องในเทศบาลตำบลท่าเกษม จะนำไปสู่การบริหารจัดการปัญหาขยะมูลฝอยที่ดีและช่วยลดปัญหาด้านสิ่งแวดล้อมในเขตเทศบาลตำบลท่าเกษมด้วย

คำสำคัญ: การบริหารจัดการขยะ สิ่งแวดล้อม การมีส่วนร่วมของชุมชน เครือข่ายเชิงบูรณาการ ชุมชนตำบลท่าเกษม

Introduction

Urban community and worldwide population are currently increasing resulting in the environmental changes. Increasing demands of housing and consumer goods consequently cause several environmental problems such as global warming,

air pollution, deforestation, shortage of water and food resources. Growing of big cities is related with increasing of population and wastes including the household solid wastes such as food remains, plastics, milk bottles and general solid wastes such as papers, plastics, unused items that are discarded over the streets, rivers, ponds, or public places (Jaito, 2005). In addition, rapid growing of industry and population results in high demand of housing and foods. The industrial sector subsequently increases their productivity in order to response the consumer needs. By these reasons, solid wastes are consequently increased. A huge amount of wastes is a big problem and continuously causing of the environmental deteriorating (Siri, 2006). In general, the government agencies take responsibility in waste management. However, the rapid increasing of industry, population and wastes directly results in the insufficient services by government sector, especially a local department.

Lack of responsibility is one of the problems in solid waste elimination. People in the community usually leaves the wastes as it is a duty of the cleaning staffs. And they do not participate in reducing and reusing the wastes. Actually, solving this waste problem is not only a public duty but it is also individual duty. The guideline of waste management for public sector is 4Rs. This 4Rs can build people's awareness including Reduce, Reuse, Recycle and Recover. For example: (1) people can decrease the wastes by reducing the use of unnecessary items, (2) wastes can be decreased by reusing the packaging and other items, (3) wastes can be reduced by recycling the used recyclable items or materials that can be reproduced to be a new item, and (4) recovering or repairing the items can also reduce the wastes. Following this 4Rs guideline can help to improve the living quality, economy, society, and environment. People should interest and aware about the current situation and the expansion of waste problem. In addition, both government and private sectors should be organized and cooperated the campaign projects for solving this waste problem (Kromadit, 2011).

Waste management is one of the duty of Tha Kasem Subdistrict Municipality, Muang District, Sa Kaeo Province. Although the wastes are managed by Tha Kasem Subdistrict Municipality, the public waste management within Tha Kasem Subdistrict is still not systematic and no solid waste management by emphasis on community participation within Tha Kasem Subdistrict Municipality. In the previous waste elimination process survey from the environmental department of Tha Kasem Subdistrict Municipality, people asked the municipality for buying more waste collecting truck. However, Tambon Tha Kasem Municipality could not buy a new truck because of the limited budget for waste management and their main budget was from the government. Even though the municipality can buy the waste collecting truck, there are subsequently high cost issues such as a truck driver, bins, truck workers, fuel, littered rent, and etc. Therefore, this problem is very difficult for Tha Kasem Subdistrict Municipality to solve. From this problem, we were interested in solid waste and environmental management by emphasis on community participation and integrated network in this municipality, such as training on waste management in the community, people in the community participate in reducing the amount of solid waste and separating household waste, etc. This guideline can be used for encouraging the correct waste management and preparing for future growing of the community. Moreover, this management can help to decrease the waste elimination cost and save government budget.

The data from this study can be used in complete waste management plan for the Tha Kasem Subdistrict Municipality that may lead to increase their further management efficacy.

Objectives

The objective of this research was to study an influence of attitude about solid waste separation from people who lives in Tha Kasem Subdistrict Munici cality, Muang District, Sa Kaeo Province on the amount of waste that needs the disposal within 1 day.

Literature review

Solid-waste management, the collecting, treating, and disposing of solid material that is discarded because it has served its purpose or is no longer useful. Improper disposal of municipal solid waste can create unsanitary conditions, and these conditions in turn can lead to pollution of the environment and to outbreaks of vector-borne disease that is, diseases spread by rodents and insects. The tasks of solid-waste management present complex technical challenges. They also pose a wide variety of administrative, economic, and social problems that must be managed and solved.

Solid waste refers to the range of garbage materials arising from animal and human activities that are discarded as unwanted and useless. Solid waste is generated from industrial, residential, and commercial activities in a given area, and may be handled in a variety of ways. As such, landfills are typically classified as sanitary, municipal, construction and demolition, or industrial waste sites (Siri, 2006).

Waste can be categorized based on material, such as plastic, paper, glass, metal, and organic waste. Categorization may also be based on hazard potential, including radioactive, flammable, infectious, toxic, or non-toxic wastes. Categories may also pertain to the origin of the waste, whether industrial, domestic, commercial, institutional, or construction and demolition. Regardless of the origin, content, or hazard potential, solid waste must be managed systematically to ensure environmental best practices. As solid waste management is a critical aspect of environmental hygiene, it must be incorporated into environmental planning (Jaito, 2005).

Solid waste management is defined as the discipline associated with control of generation, storage, collection, transport or transfer, processing and disposal of solid waste materials in a way that best addresses the range of public health, conservation, economic, aesthetic, engineering, and other environmental considerations (World Health Organization, 1971).

In its scope, solid waste management includes planning, administrative, financial, engineering, and legal functions. Solutions might include complex inter-disciplinary relations among fields such as public health, city and regional planning, political science, geography, sociology, economics, communication and conservation, demography, engineering, and material sciences.

Solid waste management practices can differ for residential and industrial producers, for urban and rural areas, and for developed and developing nations. The administration of non-hazardous waste in metropolitan areas is the job of local government authorities. On the other hand, the management of hazardous waste materials is typically the responsibility of those

who generate it, as subject to local, national, and even international authorities.

Objectives of Waste Management, the primary goal of solid waste management is reducing and eliminating adverse impacts of waste materials on human health and the environment to support economic development and superior quality of life. This is to be done in the most efficient manner possible, to keep costs low and prevent waste buildup.

The concept of community participation, there is no fixed definition that can describe a clear meaning of community participation. This is because different researchers interpret the purpose of community participation with different views. The community participation concept has different meanings to different people to such an extent that virtually many community-based project or program that is now being a fashionable termed "Community participation". It is also known as citizen participation, people's participation, public participation, and popular participation. Armitage (1988) defined community participation as a process by which communities act in response to public concerns, voice out their opinions about decisions that affect them, and take responsibility for changes to their community. Below are concepts and issues raised by previous research:

- An interactive process (interactive) that involves communication, listening, consulting, mergers and collaborations with the public, who is also as a partner who will also participate to give consent and opinion on the decision making process (Okello et al, 2009).

- Information sharing, involving communities in decision-making process, taking into consideration the idea and opinion of the community and empower the community in terms of ability to influence the decision-making process (Gladstone Ports Corporation, 2008).

- Community participation describes any process that starts to inform, gather input or involve the community regarding decision making processes. This covers all levels of information, awareness creation, outreach, inputs involvement and collaboration (RPRLGSP, 2009).

Research scope

Content scope

This research was focused on the study of community participation in solid waste management in Tha Kasem Subdistrict Municipality, Muang District, Sa Kaeo Province. The content was consisted of concept and theory about participation, solid waste management, and related research.

Studied target group

The research was a quantitative research that focused on the community participation in solid waste management in Tha Kasem Subdistrict Municipality, Muang District, Sa-Kaeo Province. Because the exact number of the population is unknown. Therefore, the sample population was determined by using the Taro Yamane table method for 400 people. Data collection was carried out by community leaders in each village. It was found that most of the respondents were elderly people and therefore encounter difficulties in literacy. In addition, people in the community are cautious in giving information to people outside the community. It is a limitation in collecting research data. Therefore, only 73 complete questionnaires remain.

Conceptual Framework

The attitude in solid waste separation of people in Tha Kasem Subdistrict Municipality, Muang District, Sa-Kaeo Province.

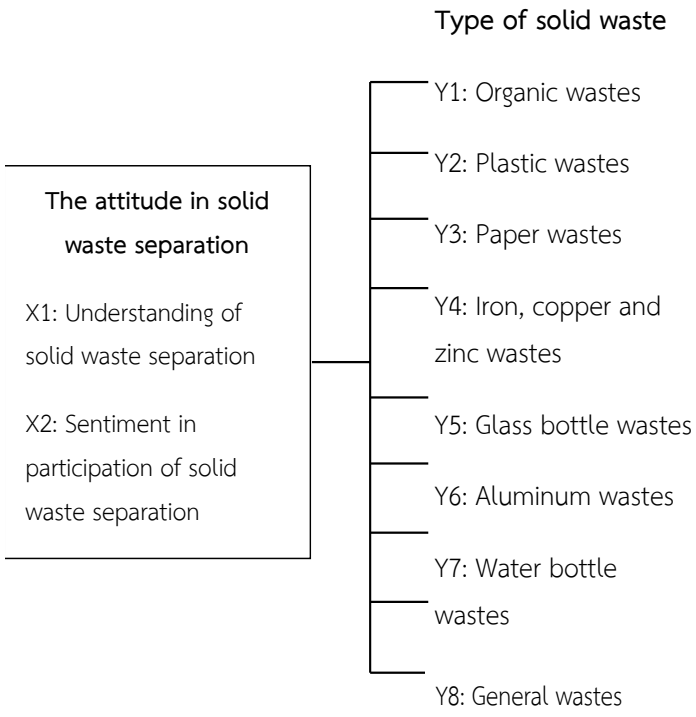

Figure 1 Conceptual Framework

Methodology

Data collection

Questionnaire was used as a research tool in this study. The data was consisted of:

1. Primary data: Primary data was collected by surveying the area of Tha Kasem Subdistrict Municipality, Muang District, Sa Kaeo Province. In addition, the data was also collected from interviewing the people and Chief Executive of the Tha Kasem Subdistrict Administrative Organization.

2. Secondary data: Secondary data was collected from books, websites, documents and related literatures such as research theory, research articles, research reports, and etc.

Statistical analysis

The research tool in this study was a questionnaire for collecting the data by using self-enumeration method and multiple linear regression (enter method) was used to analyze the hypothesis.

Results

To analyze the multiple linear regression, these results could be concluded that the error of independent variables which consisted of understanding in solid waste separation and sentiment in participation of solid waste separation was independent of each other. From the Enter method, the results showed that the Understanding of solid waste separation (X1) of the attitude in solid waste separation of people in Tha Kasem Subdistrict Municipality, Muang District, Sa- Kaeo Province influenced on the amount of the solid wastes that needs the disposal within 1 day according to the main hypothesis (Table 1-9)

From Table 1, the results showed that R2 was .164 or 16.4%. These results indicated that the amount of the organic wastes that people in Tha Kasem Subdistrict Municipality needs the disposal within 1 day was different because the difference of the attitudes in organic waste separation was 16.4%. Therefore, this result was passed the assumption for multiple linear regression analysis and there was no multicollinearity in each of the independent variables. It was found that the understanding of solid waste separation (X1) significantly influenced to the amount of the organic wastes that needs the disposal within 1 day (p=0.003). Whereas the sentiment in participation of solid waste separation (X2) did not influence to the amount of the organic wastes that needs the disposal within 1 day (p=0.165). The equation of the multiple linear regression was then defined as shown in (Eq. 1).

$$\hat{Y} = 6.77\text{-}1.90X1 \qquad (1)$$

Table 1

Influential analysis between the attitude in solid waste separation of people in Tha Kasem Subdistrict Municipality, Muang District, Sa-Kaeo Province and the amount of the organic wastes that needs the disposal within 1 day by using Enter method

The attitude in solid waste separation of people in Tha Kasem Subdistrict Municipality, Muang District, Sa-Kaeo Province	**Regression Coefficient**	**SD**	**p-value**	**R^2**
Constant value	6.77	1.86	.001	.164
Understanding of solid waste separation (X1)	-1.90	.61	.003	
Sentiment in participation of solid waste separation (X2)	.96	.62	.165	

Table 2

Influential analysis between the attitude in solid waste separation of people in Tha Kasem Subdistrict Municipality, Muang District, Sa-Kaeo Province and the amount of the plastic wastes that needs the disposal within 1 day by using Enter method

The attitude in solid waste separation of people in Tha Kasem Subdistrict Municipality, Muang District, Sa-Kaeo Province	**Regression Coefficient**	**SD**	**p-value**	**R^2**
Constant value	11.94	4.28	.007	.055
Understanding of solid waste separation (X1)	-2.61	1.62	.111	
Sentiment in participation of solid waste separation (X2)	1.19	1.66	.476	

From Table 2, the values of R^2 was .055 or 5.5%. These results indicated that the amount of the plastic wastes that people in Tha Kasem Subdistrict Municiplaity needs the disposal within 1 day was different because the difference of the attitude in the plastic waste separation was 5.5%. Therefore, this result was passed the assumption for multiple linear regression analysis and there was no multicollinearity in each of the independent variables. It was found that the understanding of solid waste separation (X1) and the sentiment in participation of solid waste separation (X2) did not influence to the amount of the plastic wastes that needs the disposal within 1 day (p=0.111 and 0.476, respectively).

From Table 3, the R^2 value was .010 or 1.0%. These results indicated that the amount of the paper wastes that people in Tha Kasem Subdistrict Municipality needs the disposal within 1 day was different because of the difference of the attitude in the paper waste separation was 1.0%. Therefore, this result was passed the assumption for multiple linear regression analysis and there was no multicollinearity in each of the independent variables. It was found that the understanding of solid waste separation (X1) and the sentiment in participation of solid waste separation (X2) did not influence to the amount of the paper wastes that needs the disposal within 1 day (p=0.940 and 0.607, respectively).

From Table 4, the R^2 value was .21 or 21.09%. These results indicated that the amount of the iron, copper and zinc wastes that people in Tha Kasem Subdistrict Municipality needs the disposal within 1 day was different because of the difference of the attitude in the iron, copper and zinc wastes separation was 21.0%. Therefore, this result was passed the assumption for multiple linear regression analysis and there was no multicollinearity in each of the independent variables. It was found that the understanding of solid waste separation (X1) and the sentiment in participation of solid waste separation (X2) did not influence to the amount of iron, copper and zinc wastes that needs the disposal within 1 day (p=0.612 and 0.305, respectively).

From Table 5, the R^2 value was .057 or 5.7%. These results indicated that the amount of the glass bottle wastes that people in Tha Kasem Subdistrict Municipality needs the disposal within 1 day was different because of the difference of the attitudes in the glass bottle wastes separation was 5.7%. Therefore, this result was passed the assumption for multiple linear regression analysis and there was no multicollinearity in each of the independent variables. It was found that the understanding of solid waste separation (X1) significantly influenced to the amount of the glass bottle wastes that needs the disposal within 1 day (p = 0.043). Whereas the sentiment in participation of solid waste separation (X2) did not influence to the amount of the glass bottle wastes that needs the disposal within 1 day (p=0.076). The equation of the multiple linear regression was then defined as shown in (Eq. 2).

$$\hat{Y} = 6.36-2.76X1 \qquad (2)$$

Table 3

Influential analysis between the attitude in solid waste separation of people in Tha Kasem Subdistrict Municipality, Muang District, Sa-Kaeo Province and the amount of the paper wastes that needs the disposal within 1 day by using Enter method

The attitude in solid waste separation of people in Tha Kasem Subdistrict Municipality, Muang District, Sa-Kaeo Province	Regression Coefficient	SD	p-value	R^2
Constant value	3.04	2.89	.296	.010
Understanding of solid waste separation (X1)	-.08	1.09	.940	
Sentiment in participation of solid waste separation (X2)	.58	1.12	.607	

Table 4

Influential analysis between the attitude in solid waste separation of people in Tha Kasem Subdistrict Municipality, Muang District, Sa-Kaeo Province and the amount of the iron, copper and zinc wastes that needs the disposal within 1 day by using Enter method

The attitude in solid waste separation of people in Tha Kasem Subdistrict Municipality, Muang District, Sa-Kaeo Province	Regression Coefficient	SD	p-value	R^2
Constant value	5.13	2.19	.022	0.21
Understanding of solid waste separation (X1)	-.421	.826	.612	
Sentiment in participation of solid waste separation (X2)	.878	.849	.305	

Table 5.

Influential analysis between the attitude in solid waste separation of people in Tha Kasem Subdistrict Municipality, Muang District, Sa-Kaeo Province and the amount of the glass bottle wastes that needs the disposal within 1 day by using Enter method

The attitude in solid waste separation of people in Tha Kasem Subdistrict Municipality, Muang District, Sa-Kaeo Province	Regression Coefficient	SD	p-value	R^2
Constant value	5.13	2.19	.022	0.21
Understanding of solid waste separation (X1)	-.421	.826	.612	
Sentiment in participation of solid waste separation (X2)	.878	.849	.305	

Table 6

Influential analysis between the attitude in solid waste separation of people in Tha Kasem Subdistrict Municipality, Muang District, Sa-Kaeo Province and the amount of the aluminum wastes that needs the disposal within 1 day by using Enter method

The attitude in solid waste separation of people in Tha Kasem Subdistrict Municipality, Muang District, Sa-Kaeo Province	Regression Coefficient	SD	p-value	R^2
Constant value	2.59	7.38	.727	. 010
Understanding of solid waste separation (X1)	-.62	2.78	.825	
Sentiment in participation of solid waste separation (X2)	1.75	2.86	.543	

From Table 6, the R^2 value was .010 or 1.0%. These results indicated that the amount of aluminum wastes that people in Tha Kasem Subdistrict Municipality needs the disposal within 1 day was different because of the difference of the attitude in the aluminum wastes separation was 1.0%. Therefore, this result was passed the assumption for multiple linear regression analysis and there was no multicollinearity in each of the independent variables. It was found that the understanding of solid waste separation (X1) and the sentiment in participation of solid waste separation (X2) did not influence to the amount of the aluminum wastes that needs the disposal within 1 day (p=0.825 and 0.543, respectively).

From Table 7, the R^2 value was .063 or 6.3%. These results indicated that the amount of the water bottle wastes that people in Tha Kasem Subdistrict Municipality needs the disposal within 1 day was different because of the difference of the attitude in the water bottle wastes separation was 6.3%. Therefore, this result was passed the assumption for multiple linear regression analysis and there was no multicollinearity in each of the independent variables. It was found that the understanding of solid waste separation (X1) and the sentiment in participation of solid waste separation (X2) did not influence to the amount of the water bottle wastes that needs the disposal within 1 day (p=0.071 and 0.353, respectively).

From Table 8, the R^2 value was .046 or 4.6%. These results indicated that the amount of the general wastes including plastic bags and foam boxes that people in Tha Kasem Subdistrict Municipality needs the disposal within 1 day was different because of the difference of the attitude in the general wastes separation was 4.6%. Therefore, this result was passed the assumption for multiple linear regression analysis and there was no multicollinearity in each of the independent variables. It was found that the understanding of solid waste separation (X1) and the sentiment in participation of solid waste separation (X2) did not influence to the amount of the general wastes including plastic bags and foam boxes that needs the disposal within 1 day (p=0.689 and 0.540, respectively).

From Table 9, the R^2 value was .035 or 3.5%. These results indicated that the amount of

the hazardous wastes that people in Tha Kasem Subdistrict Municipality needs the disposal within 1 day was different because of the difference of the attitude in the hazardous wastes separation was 3.5%. Therefore, this result was passed the assumption for multiple linear regression analysis and there was no multicollinearity in each of the independent variables. It was found that the understanding of solid waste separation (X1) and the sentiment in participation of solid waste separation (X2) did not influence to the amount of the hazardous wastes that needs the disposal within 1 day (p=0.307 and 0.134, respectively).

Table 7

Influential analysis between the attitude in solid waste separation of people in Tha Kasem Subdistrict Municipality, Muang District, Sa Kaeo Province and the amount of the water bottle wastes that needs the disposal within 1 day by using Enter method

The attitude in solid waste separation of people in Tha Kasem Subdistrict Municipality, Muang District, Sa Kaeo Province	**Regression Coefficient**	**SD**	**p-value**	**R^2**
Constant value	11.88	4.33	.008	0.063
Understanding of solid waste separation (X1)	-2.99	1.64	.071	
Sentiment in participation of solid waste separation (X2)	1.57	1.68	.353	

Table 8

Influential analysis between the attitude in solid waste separation of people in Tha Kasem Subdistrict Municipality, Muang District, Sa-Kaeo Province and the amount of the general wastes including plastic bags and foam boxes that needs the disposal within 1 day by using Enter method

The attitude in solid waste separation of people in Tha Kasem Subdistrict Municipality, Muang District, Sa-Kaeo Province	**Regression Coefficient**	**SD**	**p-value**	**R^2**
Constant value	9.48	2.45	.000	0.46
Understanding of solid waste separation (X1)	-.37	.92	.689	
Sentiment in participation of solid waste separation (X2)	1.392	.92	.134	

Discussions

According to the results in this study, people in Tha Kasem Subdistrict Municiplaity was faced with several waste problems in their family including the insufficient amount of bins for solid waste separation, incorrect method in separating of solid wastes, lacking of understanding in solid waste separation, the indistinct color of bin types for solid waste separation, the inaccessibility of public relations by related departments about the benefits of household solid waste separation. These vary problems significantly differenced in the amount of the organic wastes that needs the disposal within 1 day. The research tool in this study was a questionnaire for collecting the data by using self-enumeration method and multiple linear regression (enter method) was used to analyze the hypothesis.The people who faced with the problems in their family about insufficient amount of bins for solid waste separation, the incorrect method in transferring the separated solid wastes, lacking of understanding in solid waste separation, the unclear massage on the bins resulting in difficulty to read, the indistinct color of bin types, the inaccessibility of public relations by related departments about the benefits of household solid waste separation, and the lacking of solid waste separating inducement from related departments, had significant difference in amount of the recycle wastes (plastics, papers, iron, copper, zinc, glass bottles, aluminum, water bottles), the general wastes (plastic bags and foam boxes), and the hazardous wastes that needs the disposal within 1 day ($p < .05$). These results were correlated with the previous research about the people participation of waste management in City Municipality of Nakorn Chiang Mai (Boonyachaichana, 2009). This municipality was still lack of guideline and inducing the people participation in waste separation, lack of budget and equipment in waste separation, lack of campaign and public relations about the understanding in waste management for people. The Tha Kasem Subdistrict Municipality was also lack of public relations by related departments about the benefits of household solid waste separation. In addition, the municipality was still lack of budget for supplying the enough amount of bins in responding to people's demand resulting in waste elimination by people themselves using landfilling and burning methods. Uthai Kunoran (2004) reported the effectiveness in the solid waste management of Tambon Administrative Organization in Sam Phran District, Nakorn Prathom Province. This research reported that the sufficiency of working equipment and vehicle for collecting and transferring the wastes, the ability in waste management, the people corporation were important factors effecting to efficacy of waste management. For Tha Kasem Subdistrict Municipality, we found that the municipality was also lack of equipment in waste separation and vehicle for waste collecting. Currently, the municipality hires the private company in waste collecting because of the municipality has no own waste collecting truck. This hiring affects to cost, waste collecting frequency and uncertainty of the running day and time to each village. These factors result in full of rancid wastes in the community environment. Therefore, the understanding of solid waste separation significantly influenced to the amount of the organic and glass bottle wastes that people in Tha Kasem Subdistrict Municipality needs the disposal within 1 day.

Limitation of the Study

Tha Kasem Subdistrict Municipality is a medium-sized community that has government

agencies to take care of and pay attention to waste management regularly. However, research data collection has the following limitations:

- A large number of elderly people live in the community and therefore encounter difficulties in literacy.

- The period when collecting data, most of the people were engaged in occupations such as agriculture and general employment.

- People in the community are cautious in giving information to people outside the community. It is a limitation in collecting research data.

Research suggestion

Suggestion for practicing

1) The benefit of waste separation should be publicized and campaigned. And in order to decrease the accumulation and stink of wastes, the supplying of waste collecting truck should be planned and a timetable of truck should be also provided and informed to the people.

2) The technology should be used for waste management and informed to the people.

3) Recycle waste bank should be established in each sub-district. This waste bank establishing can induce and aware the people to separate the wastes correctly. In addition, the people can get some income from their waste separation.

4) The route of the waste collecting truck should be managed in order to save cost and collect the wastes thoroughly the area of Tha Kasem Subdistrict Municipality under the limitation of time and budget.

Suggestion for further research

Sustainable waste and environmental management and the recycle waste bank establishing in Tha Kasem Subdistrict area should be further studied.

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