

POTENTIAL OF RECYCLE WASTE BANK PROJECT FOR COMMUNITY WASTE REDUCTION
: A CASE STUDY OF SUB-SIN PATTANA COMMUNITY, BANG KHUN THIEN, BANGKOK

ศักยภาพในการลดปริมาณขยะชุมชนจากโครงการธนาคารขยะรีไซเคิล
กรณีศึกษาชุมชนทรัพย์ดินพัฒนา เขตบางขุนเทียน กรุงเทพมหานคร

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Abstract

This research studied the potential of a recyclable waste bank (RWB) Sub-Sin Pattana Community, Bang Khun Thien District, Bangkok in reduction of volumes of community waste. Problems and obstacles in implementing the project were also studied. Data were collected by recyclable waste (RW) analysis, questionnaire and in-depth interview with the members and committee of RWB project. Data sources were 10 waste samples taken from 10 households, 79 respondents of structured questionnaire, 12 respondents of in-depth interview (including 10 members and 2 committee staff of the project).

The study found that people registered with the RWB project sorted their waste before

disposal, and sold RW to the project with 20% cheaper than other junk shops. The profit gained from the 20% price difference was used to improve the environment and organize public activities in the community sorting waste before disposal. The amount of domestic waste from 10 households participated in the project were reduced to 182.09 kg/mth from 647.79 kg/mth. In case all households in the community participated in the project, the amount of waste will be reduced to 6,828.38 kg/month from 24,292.13 kg/mth. However, currently most residents in the community did not participate in the project due to less profit when they sold RW to the bank instead of other junk shops. In addition, the offered price of the project was unstable. Therefore, in order to improve the project, community and project committee should

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run campaigns to enhance public acceptance and participation. Such campaigns would help increase environmental awareness in the community and encourage people to participate in the project and sort their domestic waste before disposal.

Keywords: community waste, recyclable waste, recyclable waste bank

บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์เพื่อศึกษาปริมาณขยะมูลฝอยที่ลดลงจากครัวเรือนและชุมชนจากการตั้งธนาคารรีไซเคิลทรัพยากรพัฒนา และศึกษารูปแบบการดำเนินงาน ปัญหา อุปสรรค และข้อเสนอแนะต่างๆ จากผู้ดำเนินการและประชาชนในชุมชนทรัพยากรพัฒนาเขตบางขุนเทียน กรุงเทพมหานคร ที่มีต่อการดำเนินงานของธนาคารขยะรีไซเคิล โดยการสำรวจปริมาณขยะมูลฝอยในครัวเรือนของกลุ่มตัวอย่างที่เป็นสมาชิกของธนาคารขยะรีไซเคิล จำนวน 10 ครัวเรือน และใช้แบบสอบถามสอบถามสมาชิกของธนาคารขยะรีไซเคิล จำนวน 79 ราย เป็นเครื่องมือร่วมกับการสัมภาษณ์เจาะลึกสมาชิกของธนาคารขยะรีไซเคิล จำนวน 10 ราย และคณะดำเนินงานธนาคารขยะรีไซเคิล จำนวน 2 ราย ในการเก็บรวบรวมข้อมูล

ผลการวิจัยพบว่า เมื่อครัวเรือนของกลุ่มตัวอย่างมีการคัดแยกประเภทของขยะมูลฝอยก่อนทิ้ง ในระยะเวลา 1 เดือน มีปริมาณขยะมูลฝอยในครัวเรือนที่ต้องนำไปกำจัด 182.09 กก. จากปริมาณขยะมูลฝอยทั้งหมด 647.79 กก. และหากทุกครัวเรือนในชุมชนมีการคัดแยกขยะมูลฝอยจะมีปริมาณขยะมูลฝอยที่ต้องนำไปกำจัด 6,828.38 กก. จากปริมาณขยะมูลฝอยทั้งหมด 24,292.13 กก. ธนาคารรีไซเคิลทรัพยากรพัฒนามีรูปแบบการดำเนินงาน โดยการรับสมัครสมาชิกในชุมชน และให้สมาชิกนำขยะรีไซเคิลที่คัดแยกมาฝากขายกับธนาคารขยะรีไซเคิล โดยรายได้ของธนาคารขยะรีไซเคิลเกิดจากผลต่างของราคาที่ธนาคารกำหนดต่ำกว่าราคาที่ร้านรับซื้อของเก่ารับซื้อ 20% ของแต่ละรายการ ซึ่งผลกำไรส่วนนี้จะนำไป

พัฒนาสิ่งแวดล้อมภายในชุมชนและร่วมจัดกิจกรรมในชุมชน สำหรับปัญหาและอุปสรรคที่มีต่อการดำเนินงานของธนาคารรีไซเคิลทรัพยากรพัฒนา คือ คนในชุมชนส่วนใหญ่ไม่ได้สมัครเป็นสมาชิกธนาคารขยะรีไซเคิล เนื่องจากมีราคาต่ำกว่าที่ร้านรับซื้อของเก่ารับซื้อและราคาในการรับซื้อขยะรีไซเคิลไม่แน่นอนดังนั้นคณะดำเนินงานธนาคารขยะรีไซเคิลและคณะกรรมการชุมชนควรร่วมมือกันในการรณรงค์ ประชาสัมพันธ์ให้คนในชุมชนยอมรับและมีส่วนร่วมในโครงการให้มากขึ้น โดยเน้นให้มีความตระหนักในปัญหาสิ่งแวดล้อม และกระตุ้น ให้มีการคัดแยกขยะมูลฝอยในครัวเรือนก่อนที่จะนำไปกำจัด

คำสำคัญ: ขยะชุมชน, ขยะรีไซเคิล, ธนาคารขยะรีไซเคิล

Introduction

Domestic waste from communities in Thailand has continuously increased with economic development, population growth, changes in consumption behavior and overuse of natural resources. Local administration is often weak in terms of local pollution management, limitation of budget, officers and knowledge, and the domestic waste exceeded the management capacity. There were many campaigns to enhance awareness involving local participation on waste management which helped to solve problems from the source. Several communities handle the domestic waste by reusing resources in various forms such as establishing RWB, exchanging domestic waste to eggs or rice and other recycle projects.

RWB is a form of waste management supporting waste separation. The objective of these project is to cultivate consciousness and awareness of youths and people in the community to manage the domestic waste and conserve the community environment. Setting up waste bank and implementing environmental projects and activities encourage solving other community problems as well. The waste bank decreases the quantity of municipal waste by separating domestic waste. This is the most effective way to cut off the cost of domestic waste management related to waste collection and discharge while creating income to the community⁽¹⁾.

Sub-Sin Pattana Community faced problems of illegal dumping of domestic waste in the fallow areas. There was no waste regulation in the community, and led to the dirtiness and foul smell and source of fly breeding and various pathogens. The community committee co-operated with the Bang Khun Thien District Office and Thailand Institute of Packaging Management for Sustainable Environment to set up the RWB in the community under the name "Sub-Sin Pattana Recyclable Waste Bank" and set the grand opening on March 25, 2007. Its objectives were 1) to establish the RWB by encouraging the community participation, 2) to promote RW separation, 3) to create benefit to people in the community and use

RW effectively, and 4) to be the collective point of RW purchased from the household leading to sustainable waste management and awareness improvement in waste separation and creates saving habit to people in the community. The target groups of the RWB project were youth and people in the Sub-Sin Pattana Community, Bang Khun Thien District, Bangkok.

The Sub-Sin Pattana Recyclable Waste Bank in Bang Khun Thien District, Bangkok was established by the communities which followed the model project's scheme. However, the performance and potential of the project have not been evaluated⁽²⁾. This study, therefore, pay attention to the implementation process, problems, obstacles, and options of the organizers and people in the community towards the RWB to examine the performance and the potential of the RWB project in Bang Khun Thien District as a case study.

Materials and Methods

Volume Reduction

A survey on the amount of waste generated from households which were member of the RWB, were carried on the following

(1) The sample were selected using simple random sampling. Ten households were equally chosen by using draw lots.

(2) The sample group was provided with a black plastic bag to collect the domestic waste for 7 d.

(3) The total domestic waste was weighed and sorted into 4 categories: organic wastes, RW, hazardous waste and general waste. Each type of waste was also weighed and recorded.

(4) The third step was repeated every week for 4 wk.

(5) Gathering and analyzing all the information from the sample group by making table to compare the amount of domestic waste between sorting and no-sorting ones that can be reused. The method was to figure out the potential to reduce the volume of domestic and municipal waste that have to get rid of by comparing the volume of waste reduction (Total waste – Disposal waste) and the volume of total waste, and then analyzed by percentage. Moreover, the quantity of domestic waste from each household was calculated by mean of the volume of household member sample group which can be referred as the amount of domestic waste to the people in this community.

Implementation Process, Problem, Obstacle and Opinion

Organizers and local people involved in the Sub-Sin Pattana community, Bang

Khun Thien District, Bangkok were interviewed about problems and obstacles in operating the RWB.

(1) The questionnaire was used to interview the RWB members or the parents of the members who are under 11 yr old. All members of RWB were the target group as there were only 79 members.

(2) In-depth interview was conducted with some RWB members selected using simple random sampling. Ten members were chosen using draw lots.

(3) In-depth interview was also conducted with two RWB organizers selected using the purposive sampling. Asking the information and suggestions from involved people is a significant point for this study.

(4) The data from in-depth interview were descriptively analyzed to study the operations, problems, obstacles and suggestions towards the RWB, from both RWB operators and members. Information from questionnaire were analyzed for percentage, arithmetic mean, and standard deviation using the Statistical Packages for Social Science (SPSS for Window).

Results

Volume Reduction

The total amount of waste from 10 households, 48 members, was 647.79 kg

including organic waste (182.6 kg), RW (283.1 kg), hazardous waste (1.59 kg) and general waste (180.5 kg) in one month. Disposal waste was remained 182.09 kg (hazardous waste and general waste), reducing waste quantity by 465.7 kg. If the same rate was applied to all households in

Sub-Sin Pattana community which has 1,800 members participating the project, the amount of disposal waste in one month will be 6,828.38 kg compared to 24,292.13 kg without the RWB. The reduction of waste quantity was 17,463.75 kg, which is 71.89% of the total waste (Table 1).

Table 1 The volume of waste (kg) from households sample in one month

Household's member	Organic waste	RW	Hazardous waste	General waste	Total waste	Disposal waste	Waste reduction
1/ 3	11.5	24.3	0.08	12.5	48.38	12.58	35.8
2/ 3	10.5	39.7	0.05	16.0	66.25	16.05	50.2
3/ 4	17.0	17.8	0.25	18.7	53.75	18.95	34.8
4/ 4	12.2	20.5	0.20	18.4	51.30	18.60	32.7
5/ 4	17.6	25.7	0.56	21.5	65.36	22.06	43.3
6/ 4	16.1	41.9	0.14	11.9	70.04	12.04	58.0
7/ 6	22.3	20.5	0.08	23.2	66.08	23.28	42.8
8/ 6	20.3	21.0	0.03	16.3	57.63	16.33	41.3
9/ 7	27.9	37.9	0.20	18.7	84.70	18.90	65.8
10/ 7	27.2	33.8	-	23.3	84.30	23.30	61.0
48	182.6	283.1	1.59	180.5	647.79	182.09	465.7
If 1,800	6,847.5	10,616.25	59.63	6,768.75	24,292.13	6,828.38	17,463.75

The RWB process

The staff of the Sub-Sin Pattana Recyclable Waste Bank were chosen from the community election under the supervision of the community committee. The staff of the bank consisted of a RWB manager, an accountant, two RWB committees, and a consultant. The staff

were in charge of implementing the RWB as following.

- (1) Selected a junk shop which was located near the community so that it would be convenient to sell RW. Three shops were compared, and the shop with the highest price was selected. The price for the RWB would be reduced 20% from the

junk shop price and the bank would announce the price to the members on the 25th of each month.

(2) There were 2,000 stocks of the bank at the price of 50 baht per stock, and one cannot hold more than 50 stocks.

(3) When opening an account: ones who were interested in opening an account had to bring at least 2 kg of RW the account. The staff opened the account book and then recorded the account number.

(4) Deposit: the members brought the RW to deposit at the bank during office hours (every Sunday at 1-5 pm.) with the account book. The staff would examine the RW (to prevent the incorrect separation), weighed, calculated the price and recorded in the deposit slip and the account book. The staff then separated the RW to each type and recorded in the deposit report.

(5) Withdrawal: the member must bring the account book and the identification card, filled in the withdrawal slip and handed to the staff. When withdrawing, there must be at least 20 Baht left in the account. The RWB would keep the account for the member but the total money in the account must not be less than 50 Baht. If there were no any transaction more than 1 yr, the bank would spend the money for

the community development.

(6) The staffs had to regularly check the customer registration, the deposit-withdrawal report, the deposit report and cash book to verify the results of the bank. They were also required to submit the results of monthly operational summary to Thailand Institute of Packaging Management for Sustainable Environment.

(7) Selling RW to the junk shop: when the RW is accumulated to certain amount, the manager would contact the junk shop to buy them and check the accuracy of shop's scales including the price calculation, record on selling summary form with the detail and signature of the junk shop staff.

The Involvement of the community

The majority of the RWB members have 1 bank membership in each household (83.5%) with the main reason that they want to encourage activity and develop the community (50.6%). Others have been persuaded by neighbours (36.7%). The members participate the following activities of RWB: weigh and gather RW (69.6%), donate money to RWB's activities (25.3%), persuade and suggest others people to apply for the membership (88.6%), promote the RWB's activity (74.7%), receive advantages from the RWB (46.8%), attend the community's activity which was

supported by the RWB revenue (79.7%), examine the operating report of the RWB (44.3%), and inform the problem and obstacle occurred from the RWB operation (31.6%). Members also attend other activities such as the community cleaning, “Na Baan Na Mong project” and the fertilizer composting project (60.8%).

Positive Consequence

The RWB operation do not aim to gain profit but emphasize on the waste management and the environmental conservation in the community. After the Sub-Sin Pattana Recyclable Waste Bank began its operation, the environmental problems decrease, and community in more orderly due to the less waste discharge. The community gains the proper waste management system and people in the community participate in the waste separation process. Furthermore, RWB project creates benefit and saving habit. The revenue from the project is spent for environmental improvement and sponsoring the activities in the community including the welfare in the community such as a scholarship.

The Problems (Table 2)

(1) RWB office: most of the respondents comment that the RWB office is small (59.5%), temporary and unsecured

building (12.7%) resulted in sometimes the high price RW being stolen such as copper and a box of beer. They suggest that the bank’s area should be expanded (55.7%) and constructed the new building (16.5%). The staff temporary solve the problem by moving the expensive RW to the manager’s house. The Crown Property Bureau and the Community Organizations Development Institute (Public Organization) would launch “Baan Man Kong project” at the Sub-Sin Pattana Community by reforming the land shape where houses may be restructured or removed. The RWB will move and build a new bank office building.

(2) RW price of the RWB: some of the respondents comment that price of RWB is lower than informal waste separator (20.3%) and others concerned about the uncertainty of price (6.3%). They suggest that the RWB should adjust the price equally to informal waste separator (20.3%), while the others suggest that the price should be checked and informed to the member in advance (6.3%).

(3) Community member collaboration: some of the respondents comment that the price of RW from informal waste separator is higher. This issue lead to low proportion of the community member applying for the RWB membership (13.9%) and people in the community do not have much time so

they participate less in the RWB's activity (8.9%). It is suggested that the RWB should adjust the waste price equally to informal waste separator so that more community member will apply for the bank membership and sell RW to the bank (13.9%). The bank should enhance public relations and inform detailed information of

the process and benefit of bank membership to people (8.9%). The staff of the project understand the situation, however; the bank has to gain profit from the operation by retaining 20% of the proposed price and to spend for environment improvement and other activities in the community.

Table 2 The problems, obstacles and suggestions related to RWB in the Sub-Sin Pattana Recyclable Waste Bank project

Issue	Problems and obstacles	Suggestions	
		Members	Staff
RWB office	<ul style="list-style-type: none"> - Small - Temporary and unsecured building 	<ul style="list-style-type: none"> - Fix and expand the area - Construct new building 	<ul style="list-style-type: none"> - Move the expensive RW to the manager's house - Restoration from the "Baan Man Kong project"
RW price of the RWB	<ul style="list-style-type: none"> - Price is lower than informal waste separator - Uncertain price 	<ul style="list-style-type: none"> - Adjust the price equally to informal waste separator - Check exact prices 	<ul style="list-style-type: none"> - Understand the situation - Check and inform the member in advance
Community member collaboration	<ul style="list-style-type: none"> - Sell to informal waste separator - Have no time 	<ul style="list-style-type: none"> - Adjust the price equally to informal waste separator - Enhance public relations and inform detailed information 	<ul style="list-style-type: none"> - Staff inform and make members understand the situation - Enhance public relations and inform detailed information of the process and benefit of bank membership to community

Discussions

Volume Reduction

If people in the community separate the domestic waste before dumping and reuse the waste, the amount of disposal waste would decrease 17,463.75 kg or 71.89% of the total waste. Thus, the potential of the Sub-Sin Pattana RWB to reduce the waste was 71.89%.

Only 79 people in the community register as the RWB members (4.38% of all population in the community). The potential of reducing community waste should be much higher than at the present time every household applies for the bank membership and at least 1 person per household or everyone in the community collaborate in sorting and reusing the domestic waste. In addition, if the potential in reducing community waste was at the level of this one-month study, the disposal waste and domestic waste problems will be substantially decreased.

The study results are consistent with other study⁽³⁾ on the garbage classification project of Chiang Mai Municipality and found that the project reduce the waste and the municipality has to dispose up to 268,492.08 tons or 41.83%. This could be considered as success at a high level. People in community sort recyclable garbage to sell at the recycle garbage

central market 12,833.83 tons or 3.43% and some of garbage reuse which reduce the amount of garbage to be eliminated by the municipality. In addition, this research result is also similar to a study⁽⁴⁾ but the most important thing is being able to separate the hazardous waste. Setting the days for waste collection eases the management and utilization of waste. These two methods could reduce waste volume and prevent surplus waste in city.

Implementation process

A researcher⁽⁵⁾ reported that there were 9 people operating to establish community waste bank which is opened every Sunday at 1 pm. Its processes were that people had to sort the waste and sold it to the bank. The staff weighed and recorded all the details, i.e. amount and price on the account book or members had cash immediately. The staff then helped each other to sort and transferred it to the recyclable material center. Besides, a study⁽⁶⁾ reported that Ban Thai Samakee recycling bank had 5 committees who were selected by people in the community and were in their position for 4 yr. The bank operated all the times for the convenience of customers. The staff sorted the RW in order to be easy to collect and sell. When the staff thought that they had a large amount of waste, they sold it the junk shop

which offered the best price.

The implementation processes of our RWB is similar to other RWBs: staff election, membership application followed by opening their accounts. The members separate the RW and deposit at the bank where they get cash immediately or put into their accounts. The staff then sorted the RW into types and sold to the junk shop. The Sub-Sin Pattana RWB differs from other banks in two points: the number of the bank staff and time for selling which is based on the convenience of people in the community.

Problems

a) The RWB office is temporary in a wood building. It is unsecured and expensive RW stolen. When it rains, RW become wet and devalued. Water in the building was dirty and smelly. Moreover, poisonous animals such as snakes and centipede lived in the bank office. The RWB members and people in the community participate the RWB less compared to other RWBs due to lack of confidence in safety.

b) The fluctuation of the price of RW and the price lower than informal waste separators make some members prefer to sell their RW to informal waste separators.

The RWB office and the price of RW affect on the collaboration of members and

people in the community. This conclusion is similar to other study⁽⁵⁾ of which its problems related to small bank office inconvenience. In addition, the majority in the community sell RW to informal waste separators due to unawareness of the importance of the waste bank. It is found that people in the community did not have time to go to the RWB⁽⁶⁾ as well as RWB management in schools in Chiang Rai municipal area were insufficient and narrow recycle waste storage facility⁽⁷⁾. It caused the waste overflow, dirty and untidy leading to foul smell. From the research and according to the study on the effect of recycling price uncertainty on municipal waste management choices, the study shown that the uncertainty price of recycled materials may induce a risk neutral municipality to prefer landfill disposal, even though, recycling is less expensive⁽⁸⁾.

Suggestions

a) The operational area and its office should be expanded or construct new building which is permanent and more secured. The number of the members and people in the community will there increase due to the confidence in more secured situation.

b) The staff should compare the price and announce it to the members and should explain the implementation

processes and situations of the bank to members and people in the community; therefore they will be more willing to cooperate in operations.

These suggestions are consistent with other study⁽⁵⁾ who found that the solution of Ruam Kan Sam waste bank operational problem was to fix and expand the operational area in order to be able to fully serve to all members. Likewise, a storage location should be added to prevent damage from rain, contact with soil, and run off into soil and water resources⁽⁷⁾. In addition, facilities should be cleaned on a regular basis to prevent diseases and dangerous animals as well as the price of RW should also be defined and checked periodically.

Conclusion and Recommendations

The Sub-Sin Pattana RWB set up the implementation process by planning, collaborating, and following up other existed bank organizations. The first process of RWB was applying the book account and account opening by the community members, recycle, and the deposit of RW at the bank. The staff weigh the RW and calculated the price which is 20% lower than junk shop's. The profit from the bank is used to improve environmental quality and support other activities in the community. Moreover, the members and people in the

community participate the activities of RWB also participate the other activities or projects about waste management in the community. The RWB is established to encourage RW separation by the idea of waste problem management at source which could help to relieve the environmental problems and improve living condition in the community.

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