Final Report
Joint Initiative Program 2006/2007

Environmental Awareness on Waste Management: A Pilot Project at Manggarai District, Jakarta - Indonesia

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1. ABSTRACT

This document is prepared as a report on the progress and result of a social action project in Indonesia funded by The Tokyo Foundation for fiscal year of 2006/2007. The project implements an environmental awareness arousal program on waste management at Manggarai Sub-District, Jakarta through environmental education. The project is divided into two phases. The first phase (April-October 2006) is to prepare some environmental cadres through trainings, workshops, and visitations by whose influence is expected to change people behavior toward waste. The second phase (November 2006 – March 2007) is to broaden the program to the whole community, program dissemination to broader public, strengthening link with the government for further cooperation, and preparing tools for replication in different places. The first phase resulted in recycling, composting and planting activities by the community. Home and community gardens were built for finer view and healthier environment. Seeds on initial small enterprise and service have also showed. Community members show a higher participation in local activities. This togetherness lessens the social tension. A number of refusals by non-cadre community member to separate and recycle waste exist due to the perceived difficulty of the program/activities.

2. INTRODUCTION

Waste management in Indonesia, especially in Jakarta (the capital city), is unsolved main problem yet up now. Many people still have paradigm of waste regards as useless goods. This paradigm results indifferent waste management then unrealized bad effects toward environmental health in the present and in the future.

Local government has been trying to solve the waste problem, e.g., by picking and transferring the waste to temporary waste disposal or final waste disposal, by equipping trash bins and waste disposals, and by formulating of waste management regulation. Unfortunately, these efforts do not accomplish good result yet because of the absence of service to pick and transfer the waste, and bad taken care of trash bins and waste disposal. At this moment, it is mentioned that in Jakarta total volume of waste is 6,000 tons per day consists of 55.37 percent organic and 44.63 percent non-organic.[1] If this condition is not changed, it will cause calamity to people like previous occurrence. Some waste calamities were happened and caused victims in some places in Indonesia, e.g., waste explosion in Leuwigajah, waste flood in Bandung, and waterslide (eroded waste) in Bantar Gebang.

Up till now, the system of waste regulation is effective for certain city or province since local government formulated the regulation.[2] Therefore, it is different from one city to the others. Even though pros and cons of putting national waste regulation into effect, the government is formulating The Bill of Waste Management that will be effective nationally.

The government efforts seem to be in vain since the people do not support the efforts. It will be more effective if people do waste management started in their own environment, for instance, home and RT (*Rukun Tetangga* or Block Association). For

[1] "*Kelola Sampah Sejak RT Dimulai dari Memasyarakatkan Pemilahan Sampah*" (Waste Management From RT is started by socializing waste separation), *Kompas Online* Wednesday, 24 Mei 2006, http://kompas.com/kompas-cetak/0605/24/metro/2679199.htm.

[2] For example, in Jakarta, it is effective Regional Regulation No. 2 Year 2005 about Air Pollution. One of articles of this regulation determines prohibition of waste burning at the open area causes air pollution. The fine of violation of this determination is Rp50millions.

some communities in Jakarta and others regions, the people do self-waste management towards their own waste. The team has done comparative studies in Yogyakarta (Sukunan) and Surabaya (Jambangan and Rungkut Lor) to know how the people of community manage their own waste. It is found that the role of community is more effective and flexible in waste management.

Based on this matter above, the team tried to support in waste handling by choosing certain community in Jakarta as a pilot project. The team chose RW 10 (*Rukun Warga* or Neighbourhood Association) South Manggarai community. Manggarai is the famous site for flood in rain season. There is dam control stream flow from outside into Jakarta. The RW 10 is located on the side of trolley tracks (near to Train Station of Manggarai) for lane Jakarta-Bekasi and on the side of river. This RW consists of 18 RTs and populated by 3,200 people. Most of the houses in the area do not have waste bins outside the house and the community does not have temporary waste disposal site. Based on our feasibility study, it is found that the people do not care about waste management and consider it as government responsibility. The problem is the absence of local government service to pick and to transfer their waste causes the many people throw their waste into the river. The preliminary survey ran by the team, showed that 39% of populations throw their waste into the river. The low education level (some of the illiterate and environmentally unconscious) makes them perceive their behaviour not as a problem.

3. THE PROJECT

3.1. LITERATURE REVIEW

3.1.1. Waste Generation in Jakarta and Its Potentials

Jakarta produces 26,687 m^3 of waste per day or equal to 6,000 ton per day (Cleaning Department - Regional Government of Jakarta, 2005). This number based on the assumption that the population generates 2.67l liter of waste individually. Organic

waste constitutes 65 percent of the total amount and only 35 percent is non-organic (Table 1).

Table 1. Composition of Jakarta's Waste

Composition	Percentage
Organic	65.05
Non-organic:	
Plastic	11.09
Paper	10.11
Wood/bamboo	3.11
Metal	1.90
Bone/eggshell	1.90
Glass	1.63
Others	5.21

Source: Cleaning Department - Regional Government of Jakarta, 2003

Jakarta's waste is mainly generated from residential areas (58%, Table 2). The other sources are from commercial areas (15%), industry (15%), markets (10%), and streets, parks and rivers (2%).

Table 2. Jakarta's Waste based on Its Sources

Source	Amount (m^3/day)	Percentage
Residential areas	14.998	58%
Commercial areas	3.853	15%
Industry	3.853	15%
Markets	2.569	10%
Streets, parks, and rivers	514	2%
Total	**26,687**	**100%**

Source: Cleaning Department - Regional Government of Jakarta, 2003

There are two potential factors in Jakarta's waste characteristics. First, the fact that a high percentage of its waste is in the form of organic waste. Organic waste can be separated from the other waste and put in composter to produce compost. This way, the breeding of pests (e.g. rats, cockroach) and some certain insects (e.g. fly) that could be harmful can be lowered by reducing its food sources (organic waste). The

separation of organic waste would also benefit the community since it would negate the bad odor produced from decomposed food waste before collected. Second, residential areas contribute a high amount of waste. Any improvement of waste management in residential areas would in turn change the amount and composition of total waste generated in Jakarta. Any program tackling waste problems should focus on the above factors, i.e. organic waste and residential areas.

3.1.2. Waste Recycling and Waste Separation

Many studies in the US regarding people's behavior towards waste are on the topic of recycling (Gardner & Stern, 1996; Gifford, 1997; Bell, Fisher, Baum, & Greene, 1990). The studies focus on newspaper recycling and bottles and cans recycling. While in Indonesia, similar studies mainly focus on waste separation and organic waste composting (Wardhani, 2004; Noer, 1998). The term recycling refer to the act of separating a specific waste (e.g. PET bottle), collect it in one container and make it available for further collection. In composting, people do the same process to separate organic waste, and put it together in different container for further process. Basically, both terms refer to the same acts, separating from the other waste and put it in different container. The difference between the two terms is on the form of the waste, recycling is for non-organic waste while composting is for organic waste.

3.1.3. Factors Influencing Public Participation in Waste Recycling Program

Factors influencing public participation in waste recycling program could be divided into some categories:

1. Domestic Factors,
2. Socio-economic Factors, and
3. Psychological Factors (not discussed).

1. Domestic Factors

There are many domestic factors influencing public participation in waste recycling program. Women tend to participate more actively in domestic waste management

program (Chan, 1998; De Young, 1993; Hunter, Hatch, & Johnson, 2004). Most participants in domestic waste management are between 30-39 years old (Chan, 1998). Research on the influence of education factor in waste recycling program resulted on various findings. Chan (1998) found that educational level is not a determinant factor in public participation in waste management in Hong Kong. Berger (1997) found a different result in Hong Kong as well as Noer (1998) in Indonesia.

2. Socio-economic factors

Incentive is an important factor that promotes environmental friendly behavior with low socio-economic status (Howenstine, 1993). Block leaders is another determinant factor for a high participation in waste recycling program (Reams & Ray, 1993; Wardhani, 2004; Gardner & Stern, 1996; Meneses & Palacio, 2004). De Young (1993) found that specific information on economic and environmental reasoning would change people's behavior toward waste. Information about recycling program would urge people to recycle (Howenstein, 1993; Hornik, Cherian, Madansky and Narayana, 1995). Information with direct contact has a higher influence to public participation than indirect contact (Reams & Ray, 1993). Information through feedback that changes individual norm and group norm would provide a higher participation in recycling program (Schultz, 1998). Incentive is reported to have significant relation to recycling (Hornik, Cherian, Madansky and Narayana, 1995, Gardner & Stern, 1996).

3.1.4. Effect of Information Exposure, Direct Contact and Block Leaders

Households that are familiar with recycling would more likely to recycle than those which are not (Spaccareli, Zolik, & Jason, 1990). Personal contact between program representatives and potential recyclers is considered valuable. The contact is needed in influencing persons from various income levels to begin to recycle, and to provide important information for planning future intervention (Spaccareli *et al.*, 1990). In line with what was found by Spaccareli *et al.* (1990), Werner, Byerly, White, & Kieffer (2004) found that favorable attitude toward recycling make the behavior persist.

A study by Sugiura (2005, in Vu.D., Ito,T., Phan,T.M.H., & Yamamoto,T., 2005) shows that information exposure by local government and public's behavioral commitments do play a great role on public's participation in the recycling program. Sugiura study the change of waste collection system from the dust-box system that allows people to separate waste only into 2 categories and dump it anytime to a system that requires them to separate nonburnables waste into 25 categories and brought them to the station twice a month. The city only collects burnable waste twice a week. The new system is heavily burdening the residents because they have to separate and sort their waste into 25 categories and transport them to the waste station. A longer exposure of information (1 year before the implementation of new collection system) shows a difference in people's evaluation of the system compared to a short exposure (Sugiura, 2005). People with longer exposure of information (through neighborhood meetings) show a more positive general evaluation of the new system regardless of the average of residence of households of each area. Sugiura concluded that despite burden of the new system to the residents, support from the residents can be obtained by providing sufficient information before the introduction of the new system.

A study of similar case at Nagoya City shows that a very demanding rule of recycling has accepted by the citizen without providing any incentives and sanctions (Ohnuma, Hirose, Karasawa, Yorifuji and Sugiura, 2005). The new rule is highly demanding: citizens are to separate waste into some categories daily, wash vinyl wrap and plastic trays and take them to a recycling station, use a specially designed bags for their waste (while they can get free plastic vinyl bags when they shop at supermarkets), and so on. The factors determined public acceptances are fairness and social benefit. Fairness is when public regarding the policy as fair. One important factor is when public perceived themselves being involved in the policy-making process. This is would be apparent when, for example, the government makes the effort to communicate its program with the public and take into account public opinion in the decision making related to policy. Social benefit is the benefit gain by the community (e.g. benefit gained by community with the reduction amount of waste) when individuals pay individual cost (e.g. allocate their time to separate waste).

The personal contacts involved in the meetings with the government were influential because it added credibility or weight to the information given. The communicators' (the government) effort to communicate may have expressed commitment and concern that that was a motivating factor quite independent of the information being conveyed. There two mechanisms: (1) the personal contact itself and (2) talk about recycling with others in the household and immediate community. A recycling program can not also successful if people have negative feelings or opinions of the program (Spaccareli *et al.,* 1990). Repeated reminders are necessary to maintain or raise the frequency of participation of those who have tried recycling or have some interest in doing so. Werner *et al.* (2004) found that well-design signs to recycle produce rapid and significant increase in recycling.

A study held in Somerset County, New Jersey, the US, in 1989 found that household recycling mandatory failed to get full participation of public (Simmons & Widmar, 1989). The main cause was the lack of knowledge and understanding of how to incorporate recycling practice into their everyday lives. The approach on the issue of solid waste reduction is less specific than on recycling. The effort to change people's behavior to a new set behavior (for example from putting waste in one bin to separate it into some categories) needs to provide the imagery and concrete understanding for people. Sufficient model would make residence easier to form expected behavior.

3.2. RESEARCH QUESTIONS, ASSUMPTION AND OBJECTIVE OF THE PROJECT

The research questions of this project are:

1. Would intensive environmental education transferring detailed information on waste facilitate people behavioral change toward waste handling?
2. Would intensive assistance enable people to initiate extension activities?

The project is expected to achieve the following outcomes:

1. Instruction on waste management to the community.
2. Implementation of the principal 4R (reduce, reuse, recycle, replant) to the community.

3. Instruction on organic waste management to the community.
4. Better hygiene in the community.
5. Communication with the local government and other communities which have similar problems.
6. Alleviation of social tension.
7. Awareness of a civil society.

3.3. METHODOLOGY, APPROACH AND STRATEGIC PLANS

The project is carried out through two phases. The first phase is between April-October 2006. The main objective of the first phase is to prepare some environmental cadres through trainings, workshops, and visitations by whose influence is expected to change people behavior toward waste through persuasion. The progress is monitored through regular supervision. The second phase is from November 2006 to March 2007. The main focus of the second phase is to broaden the program to the whole community (non-cadre), program dissemination to broader public, strengthening link with the government for further cooperation, and preparing tools for replication in different places. Questionnaire for research will be distributed at the end of each phase of the program. The result will be prepared in the form of academic article to be submitted to some journals. Articles for mass media are prepared in the middle of the second phase. During both phases, the project team pay regular visitation to assist the community, collect data, and monitor the progress. Data collected using journal writing (qualitative method) in daily basis.

There are two approaches use on project implementation:

1. Environmental awareness education (trainings, workshops, workshop implementations, and visit to other successful programs) to change people's perception and behavior toward waste to a more environmental-friendly behavior, and
2. Cooperation with all stakeholders (local people, waste scavengers, local government, block leaders, other communities, experts, universities, waste dealers, and religious leaders) to support the program and to help build a waste management system.

4. RESULTS

4.1. ACHIEVEMENTS

4.1.1. Waste Management and Environmental Awareness

The first phase resulted in recycling, composting and planting activities by the community. After two trainings and two visit to other similar and successful programs (in May and July 2006), people started to understand the concept of 4R (reduce, reuse, recycle, replant) (for pictures see Annex.5-9). Another visit to the final disposal site of Jakarta's waste by a limited number of community members was also done (for picture see annex.10). These activities are intended to increase environmental knowledge and awareness. The trainings were also including some instruction how to separate waste and make compost from organic waste. During the visit to other similar and successful program, trainees had the opportunity to talk with the leaders of the communities. The community produces a Community Environmental Plan (CEP) as general guidance for environmental activity for a year. This plan is accompanied by maps that indicate the problems and potentials it has.

People show different interest in parts of the program. Some people participate in all waste management activities (composting (for pictures see Annex-4), recycling, and planting (for pictures see Annex. 6 & 9), and some focuses on specific subject (Tabel 3).

Tabel 3. Public Participation in Waste Management at Manggarai
as of October 2006 (cadre and non-cadre)

	Composting (person)	**Recycling (person)**	**Planting (person)**
Active	22	18	35
Less Active	13	14	16
Not Active	52	55	36
TOTAL	**87**	**87**	**87**

Some 35 persons started home composting. Out of this number, 22 persons composting continuously, and 13 persons try it occasionally. All community members do not needed to do the composting since the existing composting spots are planned to be developed into communal ones in the second phase. One spot is expected to provide for 5-7 households.

Some RTs (block association) also collect their recyclable waste and sell it to waste dealer. They use the money to provide fund to build community gardens. Individually, community members have also made home gardens. Both home and community gardens are intended to provide finer views and healthier environment (for pictures see Annex.9). Planting activity is not only about making gardens but also learning about herbal plants and swap plants between households. People learn to use herbal plants as medicine for certain illness. For more report of ten successful environmental cadres, see Annex. 11.

The project has also got another achievement that has not been listed as an expected outcome. Community members showed their interest in the making of bio-fertilizer that would faster composting process, avoid unpleasant odor of organic waste and make plants more robust. Fourteen groups start making this bio-fertilizer and a cadre makes it in a bigger volume, bottled and labeled it, and sell it to plants vendors.

4.1.2. Project Visitation & Attendance in Community Meetings

Environmental education, community assistance, and supervision are done through a very intensive visitation to the project site.

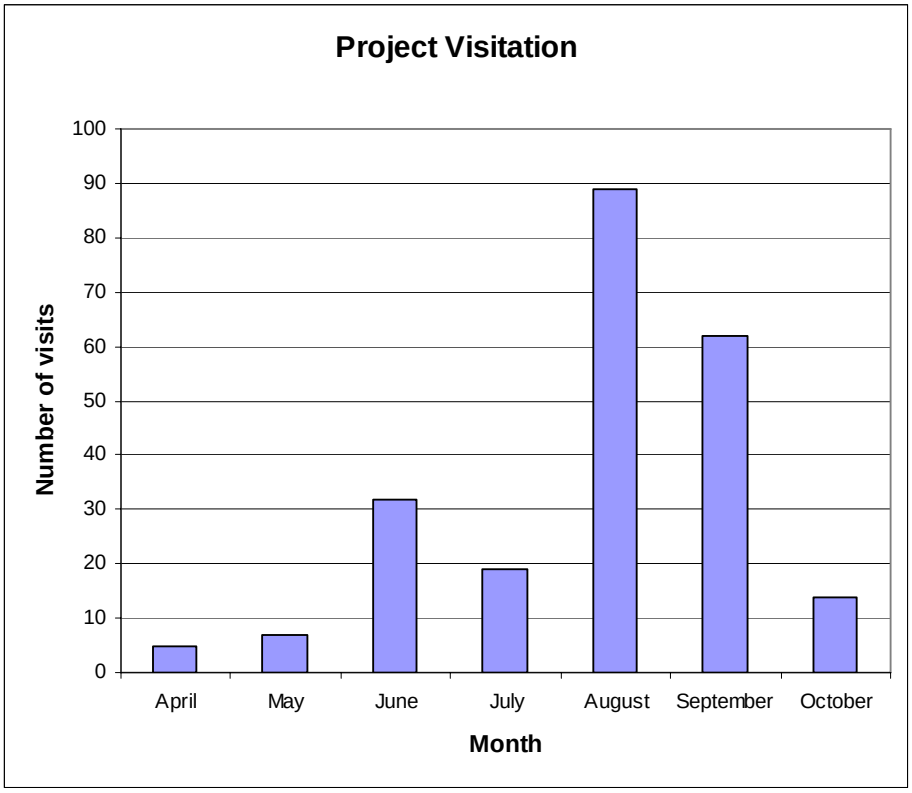

Figure 1. Frequency of Project Visit in April-October 2006.

A high visit frequency occurs in August. This is due to the request to incorporate environmental-related activity to the Independence Day celebration that fall on August 17. The community held a competition on creativity production from recyclable waste.

Aside from meeting individually with community members through visitation, the team meet them as a group as well. There are 8 community meetings attended by the project team. The remark and result of each meeting is presented in Tabel 4.

Tabel 4. Project Team's Attendance in Community Meeting (April-October 2006)

No	Activities	Date	Location	Total participant	Result
I	**COMMUNITY MEETINGS**				
1	Meeting with 28 community leaders of RW 10	17-Apr	RW 10 Office	28	Social action of the JIP Program to the community will be held for one year. The community leaders support the program and recommend competent persons to become an environmental cadres. All of cadres will participate training program.
2	Meeting with A Local Organization	07 May	RW 10 Office	40	Majority participants of local organizations are women. The role of women is very important to make the program successful. They are expected to socialize the program to others.
3	Distribution of 160 pieces waste bins from the gov't (Cleansing Dept.)	16 May	RW 10 Office	39	In the ceremony of handover of waste bins to cadres as much as 160 bins, the cadres were trained to know how to separate their waste by using the bins and how to process compost. All of them commited to do composting in their home.
4	Meeting with cadres	18 June	RW 10 Office	38	This meeting is held a month after the first training. The aims of the meeting are to communicate and know their actions. It is found that some are understand the program and the others are less understand and confused about the program. On this occasion, among them are doing question-answer or discussing about the program and sharing experiences.
5	1st Meeting with cadres to prepare the 2nd workshop	24 July	RW 10 Office	8	This meeting is held with the potential cadres of the 1st training to become committee of the 2nd training. The aim of the program is to increase the capability of organizing and designing programs autonomously.The result is they are successful in organizing the 2nd training.
6	2nd Meeting with cadres to prepare the 2nd workshop	27 July	RW 10 Office	9	This meeting is held to follow up the progress report of the 2nd training.

No	Activities	Date	Location	Total participant	Result
7	The 2nd meeting with cadres	22-Sep	RW 10 Office	25	The community meeting is scheduled once in 1 up to 3 months. The aims of this meeting are to control and evaluate their activity of the program; to motivate them to restart or continue their activity. As a result, the passive cadres start to compile their own programs for the next 3 months. It is discussed as well technique the making of proposal for government and herbal plants usage.
8	Meeting with stakeholder	5 Oct	RW 10 Office	18	Community meeting is held by invite the government officers, i.e., representative officer of garden affairs of Subdistrict and representative officer of Villager. The purpose is to unite vision and mission of local community and government. Therefore, the team could bridge between community and government interest.

Of the meetings above, the team knows cadres and Manggarai people more deeply and personally and could give them more knowledge and information regarding the program. From their point of view, they could trust the team more deeply as well. Therefore, the relationship between the team and they is much more informally. This condition eases the team to execute the program. The team has a wider networking also by the meeting.

Description of community activities is presented in Tabel 5. The activities consist of the general activity, training, workshop, and visit other fields.

Tabel 5. Project Team's Attendance in Community Activities (April-October 2006)

No	Activities	Date	Location	Total participant	Result
II	**COMMUNITY ACTIVITIES**				
9	The Indonesian Independence Day Celebration	17 August	Each RT	All community of RW 10	In celebration of the Indonesian Independence Day, the team used this moment to socialize and motivate people to participate in program. The programs are competition of environmental cleanliness, creativity contest of waste recycling, etc. The awards for the winners are champion cup and various plants.
10	Voluntary Labor Service	27 August	Field of RW 10	All community of RW 10	Voluntary labor service is togetherness activity of community in cleaning up environment. The result is environment become clean and solidarity of community become stronger.
11	Voluntary Labor Service of RT. 04	11-Sep	Neighbourhood of RT 04	8	Voluntary labor service is held not only by RW level but also by each RT periodically. RT 04, for example, has cleaner environment and stronger community solidarity.
12	Joint Breaking of the fasting in Month of Ramadhan	14 Oct	RW 10 Office	33	Main object of this meeting is to increase the cooperation between people and the team then they will participate the program consistantly.
III	**TRAINING**				
13	The 1st Workshop (41 cadres)	13 May	Villager Office	28	The aim of the 1st training is to increase the cadres' knowledge of waste management, composting, recycling, and sorting. They are also taught the communication skill in order to invite other people.
14	The 2nd Workshop (39 cadres/ 28 new)	29 July	*Madrasah* (Islamic School)	34	The aim of the 2nd training is to get new cadres (there are 28 new cadres). On this training, the trainer taught them how to analyze their own environmental problems and how to compile the program of waste handling.

No	Activities	Date	Location	Total participant	Result
IV	**WORKSHOP**				
15	Workshop & community meeting RT 11, 12, 13, 14	1-Sep	Post of RT 12	21	The workshop taught people of each RT to prepare program of environmental cleanliness and greening, to arrange local organization, to execute the program. It is explained also how to produce liquid fertilizer made of bio-organic and compost made of waste organic.
16	Workshop & community meeting RT 04 & 05	2-Sep	One of local people's house at RT 04 No 17	18	The workshop taught people of each RT to prepare program of environmental cleanliness and greening, to arrange local organization, to execute the program. It is explained also how to produce liquid fertilizer made of bio-organic and compost made of waste organic.
17	Workshop & community meeting RT 06, 07, 08	3-Sep	Jl. Lingk. RT 06	20	The workshop taught people of each RT to prepare program of environmental cleanliness and greening, to arrange local organization, to execute the program. It is explained also how to produce liquid fertilizer made of bio-organic and compost made of waste organic.
18	Workshop & community meeting RT 01	4-Sep	Kelurahan Lama	14 & RT Leader	The workshop taught people of each RT to prepare program of environmental cleanliness and greening, to arrange local organization, to execute the program. It is explained also how to produce liquid fertilizer made of bio-organic and compost made of waste organic.
19	Workshop & community meeting RT 10, 13, 14	6-Sep	Jl. Lingk. RT 14	9	The workshop taught people of each RT to prepare program of environmental cleanliness and greening, to arrange local organization, to execute the program. It is explained also how to produce liquid fertilizer made of bio-organic and compost made of waste organic.
20	Workshop & community meeting RT 02 & 03	10-Sep	Jl. Lingk. RT 03	12	The workshop taught people of each RT to prepare program of environmental cleanliness and greening, to arrange local organization, to execute the program. It is explained also how to produce liquid fertilizer made of bio-organic and compost made of waste organic.

No	Activities	Date	Location	Total participant	Result
21	Workshop & community meeting RT 14	12-Sep	Jl. Lingk. RT 14	21	The workshop taught people of each RT to prepare program of environmental cleanliness and greening, to arrange local organization, to execute the program. It is explained also how to produce liquid fertilizer made of bio-organic and compost made of waste organic.
V	**VISIT OTHER**				
22	Visit to Banjarsari	14 May	Banjarsari	28	The visit to other succesful similar program is aim to motivate cadres for more concerns to their own environment. The result showed that after visitation most of cadres are more enthusiastic to improve their environment. For instance, block association 12, 14, 04, 05 were build public park, composted their organic waste and gathered their non organic waste to sell.
23	Visit to Rawajati	06 August	Rawajati	21	Visiting to Rawajati is the second visit to motivate new cadres on the second training as same as purpose with the first visit to Banjarsari. The result is solidarity of cadres to improve their environment.
24	Visit to waste final disposal site in Bantar Gebang	30 July	Bekasi	9	Inviting cadres to observe the waste processing by government. The purpose of this activity is to make them realize the amount of waste and kinds of waste. The result is they realize how much the amount of waste produced in city and know that nonorganic waste be able to be recycled by separating.
25	Visit *Badan Pembinaan Pertanian* (Institution of Farming Building) DKI Jakarta	16 August	Ragunan	5	Inviting cadres to observe process of cultivation and to recognize kinds of plants as herbal plants, dense plants, and ornamental plants.

Impact of the mentioned activities above is motivation of cadres is higher to improve their own environment by 4R principle of waste management. Besides, the activities strengthen the solidarity and build cooperation among cadres.

4.2. NETWORKING

During the project, the networks that were established can be categorized into two kinds as follow:

1. **Vertical Network**

   This term refers to the relation between community and government which facilitated by the team. The significance of this relation is to build mutual understanding as well as mutual support in waste management.

2. **Horizontal Network**

   This term refers to the relation among Manggarai community itself and with others community that have been doing the similar project, such as Banjarsari and Rawajati Village. The importance of this relation is to share knowledge and experience among all those committed community in environmental concern.

To reach above circumstances, the team really aware of government and other stakeholders role in that matters. Therefore, the team has already established the network with some related department, government official and several NGO.

5. ANALYSIS

The quite many people committed themselves in composting activities (Tabel 3) is an unexpected progress since the process involves some steps that could be perceived as inconvenience like putting organic waste in composter, put a layer of soil on top of it, jot down the date they start composting in one composter to harvest the compost, and tap the leachate and add bio-fertilizer occasionally. This number (22 persons) is

higher that those who recycle (18 persons) which in fact require less effort than composting.

Contrast to this result is the finding by Gamba and Oskamp (1994). Their research found that personal inconvenience is the main reason for people not to recycle. The reason behind this difference could be what reported by community member that they produce very low amount of non-organic waste due to the low socio-economic status of the people. Recycle does not became a real activity for them compare to composting. Composting is also accepted more easily because it more related to planting activities (35 persons) than recycle.

A number of refusals by non-cadre community member to separate and recycle waste exist due to the perceived difficulty of the program. As also showed by the study of Gamba and Oskamp (1994), personal inconvenience is one factor for not participate in the program. Further approaches should address the issue of perceived difficulty and internal motivation. The reason for not recycling could be also derived from the unfairness of the situation because the neighboring communities received waste collection service from the Cleaning Department. The existence of unfairness is one factor that leads to the refusal of the new system (Ohnuma *et al.*, 2005). It is important to create positive feelings or opinions of the program because a recycling program can not be successful if people have negative feelings or opinions of the program (Spaccareli *et al.*, 1990).

In addition to those refusal and support above, this action program has come with many practical benefits. Among these benefits, the community enjoys the change on their environment to better scenery, cleaner and greener environment. The new gardens and cleanliness provide them with a more livable space. The plants provide them cleaner air (some of the plants could also prevent dust from their rooms) and cheap herbal medicine.

The many activities done make the community meet and work together more often. The gathering create new bond between the community members that eliminate the social tension. Their contact with block leaders and local governments while working

together with the project team put them into new understanding of their civic position. This can be act as their civic education because they practice them.

The community has also started to find some ways to get more income. They started to see the opportunities and jobs from the program. What has been perceived as the opportunity is the opportunity of providing waste collection system, market for bio-fertilizer production and recycling products, and plants reproduction. This leads to the opportunity of program extension of the economic aspects of waste management. A more active involvement of local government could help this situation and make the people feel that they are being involved in the decision making process by the government and that their opinion is valued.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1. CONCLUSIONS

During the project, some points can be concluded as below:

1. Environmental education is best given in the form of providing detailed information compare to general knowledge. Information on how-to would urge people to change their behavior.
2. People who deal directly with the community should prepare themselves with sufficient knowledge on the issue in question.
3. Constant assistant should be provided until the person is able to perform the minimum procedure of 4 R (recycle, reuse, reduce and replant) activities. For instance, wrong treatment of composting would lead to failed process like unpleasant odor and slugs.
4. Broaden waste management should need the involvement of multi level networking, both among community and other stakeholders.

6.2. RECOMMENDATION

The team recommends some points as below:

1. The government as policy maker, normatively, could produce set of waste management policies and rules which accommodating and arising the community enthusiasm to perform them consciously.
2. The government should set a massive campaign of environmental awareness for every level of community.
3. Every facilitator in each projects of community-based environmental awareness should establish a joint forum to share knowledge and experience in order to achieve the most effective concept of implementation.

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