

COMPARATIVE ASSESSMENT

COMMUNITY BASED SOLID WASTE MANAGEMENT (CBSWM)

MEDAN, BANDUNG, SUBANG AND SURABAYA



NOVEMBER 2006

This publication was produced by Development Alternatives, Inc. for the United States Agency for International Development under Contract No. 497-M-00-05-00005-00

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Women of Wonokromo is actively involved in non-organic waste recycle. An exemplary community initiative in waste reduction efforts.

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Title:	Comparative Assessment Community Based Solid Waste Management (CBSWM) Medan, Bandung, Subang and Surabaya
Program, activity, or project number:	Environmental Services Program, DAI Project Number: 5300201.
Strategic objective number:	SO No. 2, Higher Quality Basic Human Services Utilized (BHS).
Sponsoring USAID office and contract number:	USAID/Indonesia, 497-M-00-05-00005-00.
Contractor name:	DAI.
Date of publication:	November 2006

TABLE OF CONTENTS

LIST OF FIGURES	III
1. THE OBJECTIVES	I
2. FACTS AND FINDINGS: ANALYSIS ON THE STUDIED AREAS	2
2.1. DESA TEMBUNG, MEDAN	2
2.1.1. Background info	2
2.1.2. Program phase	2
2.1.3. Driving force	2
2.1.4. Community facilitation	3
2.1.5. Community involvement	3
2.1.6. Solid waste management developed/planned	3
2.1.7. Attainment	4
2.1.8. Integration with municipal solid waste management system	5
2.1.9. Additional info	5
2.2. LINGKUNGAN 4 BAPOR BELAWAN, MEDAN	5
2.2.1. Background info	5
2.2.2. Program phase	6
2.2.3. Driving force	6
2.2.4. Community facilitation	6
2.2.5. Community involvement	6
2.2.6. Solid waste management developed/planned	7
2.2.7. Attainment	7
2.2.8. Integration with municipal solid waste management system	7
2.2.9. Additional info	7
2.3. DESA SUNGGAL, MEDAN	8
2.3.1. Background info	8
2.3.2. Program phase	8
2.3.3. Driving force	8
2.3.4. Community facilitation	8
2.3.5. Community involvement	8
2.3.6. Solid waste management developed/planned	9
2.3.7. Attainment	9
2.3.8. Integration with municipal solid waste management system	9
2.3.9. Additional info	9
2.4. CBS ESP-BORDA: RUSUNAWA IN BELAWAN AND BELAWAN LINGKUNGAN 3, MEDAN	10
2.5. MARELAN, MEDAN	10
2.6. KELURAHAN TAMANSARI, BANDUNG	10
2.6.1. Background info	10
2.6.2. Program phase	11
2.6.3. Driving force	11
2.6.4. Community facilitation	11
2.6.5. Community involvement	12
2.6.6. Solid waste management developed/planned	12
2.6.7. Attainment	12
2.6.8. Integration with municipal solid waste management system	12
2.6.9. Additional info	12

2.7.	DESA CISUSUK, SUBANG	13
2.7.1.	Background info	13
2.7.2.	Program phase.....	13
2.7.3.	Driving force	13
2.7.4.	Community facilitation.....	13
2.7.5.	Community involvement.....	13
2.7.6.	Solid waste management developed/planned.....	14
2.7.7.	Attainment.....	14
2.7.8.	Integration with municipal solid waste management system.....	14
2.7.9.	Additional info.....	14
2.8.	DARA ULIN, BANDUNG	15
2.9.	KELURAHAN WONOKROMO, SURABAYA	15
2.9.1.	Background info	15
2.9.2.	Program phase.....	15
2.9.3.	Driving force	15
2.9.4.	Community facilitation.....	15
2.9.5.	Community involvement.....	16
2.9.6.	Solid waste management developed/planned.....	16
2.9.7.	Attainment.....	17
2.9.8.	Integration with municipal solid waste management system.....	19
2.9.9.	Additional info.....	19
2.10.	KELURAHAN GADING, SURABAYA	19
2.10.1.	Background info	19
2.10.2.	Program phase.....	19
2.10.3.	Driving force	19
2.10.4.	Community facilitation.....	20
2.10.5.	Community involvement.....	20
2.10.6.	Solid waste management developed/planned.....	21
2.10.7.	Attainment.....	21
2.10.8.	Integration with municipal solid waste management system.....	21
2.10.9.	Additional info.....	21
2.11.	KELURAHAN JAMBANGAN, SURABAYA	21
2.11.1.	Background info	21
2.11.2.	Program phase.....	22
2.11.3.	Driving force	22
2.11.4.	Community facilitation.....	22
2.11.5.	Community involvement.....	22
2.11.6.	Solid waste management developed/planned.....	23
2.11.7.	Attainment.....	23
2.11.8.	Integration with municipal solid waste management system.....	24
2.11.9.	Additional info.....	24
3.	FORMULATING CHALLENGES AND RECOMMENDATIONS.....	25
3.1.	DEPENDENCY TO MUNICIPAL SOLID WASTE SERVICE	25
3.2.	CERTAINTY OF WASTE MATERIAL FLOW	25
3.3.	WILLINGNESS TO PARTICIPATE.....	26
3.4.	TECHNICAL OPERATION.....	26
3.5.	EFFECTIVE CLEANLINESS AND GREENERY PROGRAM.....	27
APPENDIX – COMMUNITY BASED SOLID WASTE MANAGEMENT ASSESSMENT SHEET		28

LIST OF FIGURES

FIGURE 1 COMMUNAL COMPOSTING PILE.....	4
FIGURE 2 GARBAGE BOX IN NEAR THE RIVER.....	5
FIGURE 3 HOUSES OF STILTS.....	6
FIGURE 4 COMPOSTING BASKET.....	7
FIGURE 5 COMPOSTING DRUM.....	9
FIGURE 6 CIKAPUNDUNG RIVER IN TAMANSARI.....	11
FIGURE 7 GARBAGE SORTING EVENT.....	14
FIGURE 8 STORAGE ROOM OF RECYCLABLES.....	16
FIGURE 9 INDIVIDUAL COMPOSTER CALLED TAKAKURA.....	17
FIGURE 10 COMMUNITY MEMBERS SHOWING HANDCRAFT PRODUCTS FROM GARBAGE.....	17
FIGURE 11 GREENING IN WONOKROMO RIVER.....	18
FIGURE 12 RIVER IN WONOKROMO BEFORE THE PROGRAM.....	18
FIGURE 13 RIVER IN WONOKROMO AFTER THE PROGRAM.....	18
FIGURE 14 OPEN DUMPING SITE IN RW 17.....	20
FIGURE 15 WOMEN TRIED TO PUSH GARBAGE TO FOLLOW THE RIVER FLOW.....	20
FIGURE 16 WALL PAINTED BY THE COMMUNITY TO SUPPORT THE CLEAN AND GREEN AWARD.....	22
FIGURE 17 WOMEN CADRE SHOWING THE COMMUNAL COMPOSTER.....	23

I. THE OBJECTIVES

Development of solid waste management systems has become one of challenging issues in ESP regions. To meet the required outcome of at least 15 solid waste management plans developed and implemented, at least two regions (Medan and Surabaya) have started and implemented community based solid waste management (CBSWM) program since year 2005. While in other regions, some preparations are underway.

Visits were made on June 19 – 28, 2006 to 6 locations in Medan, 2 locations in Bandung, 1 location in Subang, and 3 locations in Surabaya. Among these are not specifically SWM site, yet they provide valuable examples on community organization methods and approaches hence enriching the analysis. In the other hand, some other CBSWM areas were not visited due to time limitation.

The objectives of this ESP Orientation are to:

1. obtain and share as much lessons learned as possible about community based solid waste management in different locations of ESP regions
2. develop program plan of community based solid waste management in Jakarta especially for Penjarangan site
3. prepare comparative assessment of community based solid waste management in ESP regions

The assessment was carried out by field observations and discussions with the community, community leaders, facilitators, and ESP colleagues in aforementioned regions. The facts and findings for each particular site are examined in the second chapter, while the challenges and recommendations are synthesized in the third chapter, aiming to be lessons learned on community based solid waste management. A spreadsheet is also attached to summarize comparative assessment of the studied community based solid waste management sites.

2. FACTS AND FINDINGS: ANALYSIS ON THE STUDIED AREAS

2.1. DESA TEMBUNG, MEDAN

2.1.1. BACKGROUND INFO

Desa Tembung is located in peri-urban area along the Percut River, with middle-low income residents, living in the permanent houses. The community's characteristic is more of rural. The scope of community based solid waste management program was initially intended for Dusun 9, Dusun 11, Dusun 14, and Lingkungan Pelikan. Yet up to date, only Dusun 11 has shown progressive and positive response to the program.

2.1.2. PROGRAM PHASE

The site is currently in its first stage of implementation of solid waste management system, which has been developed and agreed upon by the community. The active participants are still limited to some households, thus awareness raising and knowledge spreading are still intensively undertaken to gain more participation and involvement of other community members.

2.1.3. DRIVING FORCE

The Government of Indonesia and JBIC has initiated flood control program of Deli River and its sub-stream. To meet the objective, agreement was made with ESP to choose Desa Tembung as a pilot area for community based solid waste management. ESP's role is to undertake community participation on primary collection and intermediate treatment, while JBIC will cover secondary collection and transportation from TPS to the final disposal site (TPA).

The community itself has suffered from environmental burden due to increased negative impacts of littering, burying and burning of solid waste. Before the program, Desa Tembung was not served by municipal solid waste service, thus people just disposed waste to Percut River. The idea of the program is to change this behavior.

2.1.4. COMMUNITY FACILITATION

ESP started community preparation by consultation regarding environmental issues with local leaders, and followed by recruitment and capacity building of 10 local facilitators. Community organizer named Masyarakat Peduli Lingkungan (MAPEL) was established on March 29, 2006. With assistance of an NGO named Bina Inspirasi Sahabat Peduli (BIS Peduli), MAPEL was then undertaken series of approaches to community groups such as religious, youth, and women groups. Although the active local facilitators have reduced to 2 persons (who both live in Dusun 11), the program still moved forward. Trainings were provided to the community, which included basic knowledge of community development, environmental awareness, and organic waste management. BIS Peduli also has facilitated to link the community with market of recyclable waste and compost utilization. Field study to BIS Peduli's program site was also conducted. In addition to this, recently, six field assistants have been assigned by ESP to support programs in Medan.

2.1.5. COMMUNITY INVOLVEMENT

The community has agreed to share responsibility as followed: the housewife cadres apply and promote waste segregation from their houses, while MAPEL collects the segregated waste regularly with waste cart ('becak sampah'). The primary collection is done regularly every Wednesday and Saturday. MAPEL is also responsible for composting of organic waste and coordinate with BIS Peduli for selling of anorganic waste. This comes inline with the 'sister village' scheme.

No fee is charged to the community for the service. Even so, it was indicated during the interview that they are willing to pay if proven to be successfully improve the cleanliness.

2.1.6. SOLID WASTE MANAGEMENT DEVELOPED/PLANNED

The Reduce, Reuse, and Recycling (3R) principles applied include waste segregation at households, communal composting of organic waste using windrow system, and sorting of recyclable waste. Two sacks are provided for every 2 – 3 households for collection of organic and anorganic waste. The sacks and waste carts for primary collection are provided by the community. So are the shaded area for the composting, and equipments needed for the windrow process. There are two composting demplots (demonstration plot) in this area. However, it was noted that the compost piles are covered with plastics, which may hinder the aerobic process to take place. During the interview, it was found that the composting technique adopts agriculture waste composting, which is characteristically different from household waste. Therefore, it is recommended that the process applies simple technique instead, with no additional ingredients but the waste, and regular turnings to allow the aerobic process.

Waste boxes made from concrete material are located along the Percut River, as part of JBIC contribution for this program. These boxes have become the temporary disposal site (TPS) for the community. However, due to uncertainty of secondary collection to the final disposal site (TPA) we found the TPS have been overburdened with waste, resulting littering in the area. Limited space for the trucks to access the location is also observed. Hence, more intensive coordination with JBIC program is therefore essential to solve this bottleneck.

The clean-up kampung (kerja bakti) has been regularly organized by MAPEL, but the greenery has just been initiated by individuals, and not yet programmed.

Sister village (persaudaraan kampung) concept is one of our interesting findings. The concept designs how waste generated in one kampung is used as material supply for recycling process in other kampongs. Plastic waste from Desa Tembung, Belawan, and other community groups are pooled in Marelán who undertakes plastic washing. While organic waste is pooled in Desa Tembung for composting. It was planned that the compost produced will be accepted by designated cacao farmers in Langkat. This concept is a good example to be implemented in other regions, to provide better networking and linking of different clusters and demands. But there might be additional transportation cost involved as the consequence of this scheme.



Figure 1 Communal composting pile

2.1.7. ATTAINMENT

Implementation and awareness of good practices is still limited to some households. But the community has indicated that littering, waste burying and burning have been decreased in some areas.

There is no selling revenue yet for the community from the new solid waste management system, but they plan to have it from compost and sorted plastics.

The physical environment still needs a lot of improvements to be said clean and green environment. Especially when looking at the areas near the river where the TPS has become unorganized dumping sites

2.1.8. INTEGRATION WITH MUNICIPAL SOLID WASTE MANAGEMENT SYSTEM

A village regulation (Peraturan Desa) was established in 2002 regarding the cleanliness, but socialization has only reached the village officials, not to community. The site was not covered by city service until the program entered. Therefore, one of the action plans is to include this area in the city coverage for solid waste management service. It was planned that the residues (glass, rubber, etc) will be temporarily disposed in the TPS. However, as said earlier, there is no certainty of how waste collected in the TPS will be transported to TPA by the city trucks. Thus linkage with provision of infrastructure – so called the hardware – should be made more intensive with the JBIC-Gol program.



Figure 2 Garbage box in near the river

2.1.9. ADDITIONAL INFO

Most households still have no proper sanitation, they use 'cubluk¹' to defecate. Clean water is coming from PDAM.

2.2. LINGKUNGAN 4 BAPOR BELAWAN, MEDAN

2.2.1. BACKGROUND INFO

The program area lies in the tidal areas of Belawan, where the inhabitants are mostly fisherman; living in temporary wooden houses of stilts (*rumah panggung*). Lingkungan 4 is located in sea-line border. In this area, there are about 300 households, 17 community groups. These groups meet and conduct social activities. Yet only BAPOR has done solid waste management program.

¹ Cubluk is a hole built on the ground to function as latrine
ENVIRONMENTAL SERVICES PROGRAM WWW.ESP.OR.ID



Figure 3 Houses of stilts

2.2.2. PROGRAM PHASE

The stage is quite similar with Desa Tembung. The community based solid waste management is currently in the first stage of implementation, awareness raising and knowledge spreading to the community.

2.2.3. DRIVING FORCE

Unlike Desa Tembung, there is no Gol-JBIC driven program for Belawan. The program is carried out to address the heavily polluted living environment, where garbage, human faecal, and other wastewater mixed with sea water under the houses. The fishermen have also faced decreasing fish catchment, which resulted in worsens economic condition. Sea water is also no longer safe to be used by children to play.

2.2.4. COMMUNITY FACILITATION

The facilitation process is quite similar with Desa Tembung. BIS Peduli is also involved. But in addition to that, there is a scheme called 'Bank Sampah' or Bank of Waste, which was initiated and established by the community. The scheme is designed to allow saving of money in exchange of certain eligible waste category given by the community, such as plastics, paper, and compostable waste. The objective of this scheme is to stimulate community participation to waste segregation.

2.2.5. COMMUNITY INVOLVEMENT

Coordinated by a focal local person, Pak Bachtiar, the community has started applying and promoting waste segregation and composting. The community organizer collects the segregated waste regularly, compost the organic waste, and coordinate with BIS Peduli for anorganic waste. Bank Sampah has been operated for 3 months and is responsible for compensating the agreed recyclable materials given by the community. No fees is charged to the community, instead, they receive incentive from Bank Sampah for segregating the waste.

2.2.6. SOLID WASTE MANAGEMENT DEVELOPED/PLANNED

The solid waste management system applied is quite similar with Desa Tembung too. Except that the communal composter uses a rattan basket and polybag plastic instead of windrow system. The aerobic process looks working quite properly. The sister village concept is also applied for this location.



Figure 4 Composting basket

2.2.7. ATTAINMENT

Almost the same with Desa Tembung, the awareness and implementation of good practices are still limited to some households. But this site faces more challenges. As mentioned earlier, the water under the houses are heavily polluted with mixture of garbage, human faecal, and waste water. It is suspected that there may not be significant changes to the poor living environment, unless major mitigation is undertaken, that take into consideration waste coming from the upper-stream (i.e. the city) carried away by the river flow.

2.2.8. INTEGRATION WITH MUNICIPAL SOLID WASTE MANAGEMENT SYSTEM

The residue (glass, rubber, etc) is planned to be transported to TPS at traditional market nearby, which will be regularly transported to the TPA by the city trucks. The biggest challenge of integration lies on how the program can be linked with mitigation plan of the city towards water pollution control on tidal areas. This includes a comprehensive assessment on hydrological profile of this area.

2.2.9. ADDITIONAL INFO

The residents have no proper latrines or sanitation system. The clean water consumed is coming from deep well (about 70 m depth).

2.3. DESA SUNGGAL, MEDAN

2.3.1. BACKGROUND INFO

Desa Sunggal is located in peri-urban area, very close to the river. The residents live in semi-permanent houses with relatively low income. The program is located in Lingkungan 10 (Pantai Harapan) and Lingkungan 11 (Lembah Berkah). Serikat Perempuan Sunggal or SPS (Women Affiliation of Sunggal) members are all women, who are mostly working as 'tukang cuci' (laundry worker) for wealthier families. It was noted that there might be a need to clarify Sunggal site in related to its legal status of land tenure, as the location is suspected to be on the river bank boundary.

2.3.2. PROGRAM PHASE

The community has developed their solid waste management system, and has started 2 weeks implementation. It is important to note that Sunggal has just completed construction of public hydrant, as part of ESP program on community based water supply (small grant of Rp. 89 millions). The official launching of this facility was held recently.

2.3.3. DRIVING FORCE

Big flooding was happened in 2001, resulted on losses of lives and homes of the people. Compensation from the government was made available only for few households, creating protests from those who were not receiving any. These 'abandoned' people proclaimed SPS, and walked to city parliament to claim their rights. It was later on 2005 that SPS and ESP-USAID made an agreement to improve the household environment in Sunggal. One of the objectives was to reduce negative impacts of unmanaged waste disposal, burying and burning of solid waste.

2.3.4. COMMUNITY FACILITATION

The community is assisted by a youth organization named Suluh Muda Indonesia (SMI) who had been advocating SPS since their protest in 2001. ESP supported on capacity building, awareness raising and knowledge sharing to cadres and the community. Provision of communal composter was also integrated in the program, to allow direct implementation of the suggested solid waste management system. And similar with other locations in Medan region, Sunggal is also included in sister village concept to facilitate on finding market of recyclable waste.

2.3.5. COMMUNITY INVOLVEMENT

Unlike other location in Medan, women leadership is dominating in Sunggal, who operate and monitor the composting process, as well as segregate and put the organic solid waste in to the communal composter. No fee is charged to the community.

2.3.6. SOLID WASTE MANAGEMENT DEVELOPED/PLANNED

The solid waste management applied is quite similar with Desa Tembung and BAPOR Belawan. Except that the communal composter uses a hard plastic drum (120 L volume) instead of rattan basket or windrow system. This composter is provided by ESP. The composter is located next to the public hydrant. However, as the composter is constructed in the ground, the women have difficulties when turning the solid waste, to allow the air flow in the composter.

Either clean-up kampung and greenery have not been organized. Only some households undertake these individually. As mentioned, sister village concept is also applied here.



Figure 5 Composting drum

2.3.7. ATTAINMENT

The number of households aware and participated in the segregation and composting is still limited to SPS members. Apparently, there is a tendency in this area that SPS and non-SPS members are not getting along, due to historical background mentioned above. As the program has just recently implemented, selling of recyclable waste, improvement of physical environmental and waste reduction has not yet seen.

2.3.8. INTEGRATION WITH MUNICIPAL SOLID WASTE MANAGEMENT SYSTEM

SPS confirmed that the city service for solid waste management has not covered their area. The nearest TPS is located close to the main road. As the solid waste management system developed is planned to manage solid waste at least the organic and plastic, the dependency to TPS and final disposal is somehow reduced. However, it is still essential to solve the disposal of residues, by facilitation to the operational local agency responsible for solid waste management service.

2.3.9. ADDITIONAL INFO

It was noted that latrines are only available in some houses, but not the majority. Clean water from new public hydrant was recently constructed, as part of ESP support to this community.

2.4. CBS ESP-BORDA: RUSUNAWA IN BELAWAN AND BELAWAN LINGKUNGAN 3, MEDAN

Visit was made to these sites, but not much can be reported, as they are more on sanitation rather than solid waste. Rusunawa is a newly building constructed near the toll road, but not yet provided by proper septic tank, thus has been suggested by the city as the location for Community Based Sanitation (CBS) program of ESP and BORDA. There are no residents yet living in this bulding. However, it was noted that community preparation for Rusunawa needs to be clarified on how and to what extend it will be relevant with community based principles, as the sanitation facility design will be constructed prior to the community existence, thus could be considered as a top-down approach.

Belawan Lingkungan 3 has similar environment with Lingkungan 4 BAPOR, which is located in tidal area. About 298 households live there, majority is fishermen. MCK++ and wastewater treatment plant location have been identified. At the moment, about 32 residents use deep well (90m depth) for clean water supply.

2.5. MARELAN, MEDAN

Marelan site is known for its operation of plastic waching machine. The machine has capacity of 1 ton plastic per day, operated by 15 staffs, 8 hours a day. As part of sister village concept, the collected plastic from community groups are transferred to this area, as well as plastics from final disposal site, and other business partners. Together, they formed an association named Small Enterprise Marelan Hamparan Perak Association.

It was noted that a small grant application for procurement of new plastic washing machine (utilizing locally available machine – instead of brand new materials) is underway. However, this may need a more elaborated justification to be related to community based solid waste management, as this seems to be more on business development of recyclable waste rather than directly address the cleanliness improvement of the community.

2.6. KELURAHAN TAMANSARI, BANDUNG

2.6.1. BACKGROUND INFO

There are 2 RWs in Kelurahan Tamansari observed: RW 15 (about 574 households) and RW 20 (about 320 households). In RW 20, there are also about 800 students live there temporarily. Both RWs are located side by side in a dense urban area along Cikapundung River in Bandung city, but have slightly different socio-economic characteristic. RW 20 has middle class residents, while in RW 15, quite many of low income people live together with

the middle class households. Most of the houses in these RWs are permanent. Tamansari site provides good example of how two RTs – although located side by side – could possess different characteristic thus needs different approach in development of solid waste management

2.6.2. PROGRAM PHASE

The program is now on initiation period. Baseline solid waste management system has been surveyed and field assistance will be started soon.

2.6.3. DRIVING FORCE

ESP has decided to choose this area for its potential role in DAS Cikapundung conservation program. Also, since disaster of TPA Leuwigajah – the centralized final disposal for Greater Bandung area – in February 2005 which resulted in closing of this TPA, there was a greater need to self-manage the solid waste, thus reducing dependency to TPA. Otherwise, the impact would be enormous, which was recently happened in Bandung city. The community faced serious threat of solid waste building up in their neighborhood; causing nuisance, smell, smoke, and rodent/insect infestation.

The two RWs in Tamansari have relatively adequate solid waste management facilities provided by the municipality, but the use of these facilities remains inefficient. Waste littered in the river are often seen, some scavengers even work sorting garbage there. Therefore, awareness improvement and community preparation towards improved community based solid waste management would be a good synergy.



Figure 6 Cikapundung river in Tamansari

2.6.4. COMMUNITY FACILITATION

The community assistance will start soon by an NGO called Koalisi Untuk Jawa Barat Sehat (KUJBS). Capacity building and awareness rising to cadres and community has been started. Finding market of recyclable waste has been aware of, and will also be advocated.

2.6.5. COMMUNITY INVOLVEMENT

The community based solid waste management has not yet defined and implemented for these RWs. But the intention and willingness to have cleaner environment was expressed by both community. The existing system relies on waste collectors (petugas sampah) – who are coordinated by each RT – to daily pick up household solid waste. It is likely that these collectors also sort and sell the recyclable waste.

Waste fee of Rp. 1000 - 3500 per month per household is applied in both RTs, allocated for payment of this primary waste collection. It is collected through RT staff or directly paid to the waste collectors. It was noted that RW 20 regularly conduct registration of its residents to allow better monitoring and community involvement.

2.6.6. SOLID WASTE MANAGEMENT DEVELOPED/PLANNED

As the program implementation is not yet undertaken, segregation or composting is not yet in place. The primary collection system is supported by local government by providing some waste bins and carts. The bins are actually designated for segregated organic and anorganic waste, but the community still mix their garbage. TPS is located in the main street, provided by the local government. Sorting of recyclable waste is done by scavengers/waste collectors. They usually have already dealt with particular waste peddlars (lapak).

Clean-up kampong has been regularly organized by RW, and sometimes also done together with Lurah and other RWs. Greenery has not yet programmed. But many households, especially in RW 20, have initiated this good practice.

2.6.7. ATTAINMENT

The community based solid waste management has not been defined and implemented. However, the community preparation in Tamansari and Subang has shown good signs, as there was awareness and eagerness to participate demonstrated by the community during the visit. For a community based solid waste management program to be started soon, this is obviously a good beginning

2.6.8. INTEGRATION WITH MUNICIPAL SOLID WASTE MANAGEMENT SYSTEM

The existing system apply that mixed waste in TPS has been regularly picked up by truck of PD Kebersihan.

2.6.9. ADDITIONAL INFO

The majority of the households has individual toilet. Clean water is supplied by local water supply company or PDAM.

2.7. DESA CISUSUK, SUBANG

2.7.1. BACKGROUND INFO

Desa Cisuusuk is located in peri-urban area, but the characteristic and its landscape is rather rural, with most of the residents live as farmers. The residents are living in permanent houses and have low income. The study area is RW 07, with about 300 households live in. But the program will be targeted for 100 households first.

2.7.2. PROGRAM PHASE

The same with Tamansari, community based solid waste management program is now on initiation period. Baseline or existing system has been surveyed and field assistance will be started soon.

2.7.3. DRIVING FORCE

This area is chosen for its potential site for DAS Cipunegara conservation program of ESP. Programs to address critical land rehabilitation has also been started. To have a good community based solid waste management in this area, including how to manage the organic waste would be benefited in supporting their farming activities.

2.7.4. COMMUNITY FACILITATION

Community groups of plantation, nursery, and farming has been established and facilitated by watershed management (WSM) team and local NGO named MAPAS. ESP has helped the community to establish 16 groups, one of them named Cinta Alam Dewi Asih. Capacity building and socialization regarding solid waste management to cadres and community has been started. Finding market of recyclable waste and waste residue transportation to TPA has been aware of, and will also be advocated.

2.7.5. COMMUNITY INVOLVEMENT

Like Tamansari, the community based solid waste management has not yet defined and implemented for this area. But the intention and willingness to have improved solid waste management is desired. Women cadres have demonstrated waste segregation day event when the visit was made. The community leader who is also a farmer, planned to compost the organic waste using windrow system.



Figure 7 Garbage sorting event

2.7.6. SOLID WASTE MANAGEMENT DEVELOPED/PLANNED

No community based solid waste management is implemented yet, and no provision of solid waste management facilities was made. The plan is to apply waste segregation (which was conducted in the visit), where the residents were given plastics to contain their segregated solid waste. Composting and sorting of recyclable waste are also planned to be implemented. Greenery is being performed as part of GERHAN program of plantation, nursery, and organic farming. Cleaning kampong is conducted monthly. Networking with collector/dealer for recyclable waste has not yet defined. The produced compost will be utilized by them.

2.7.7. ATTAINMENT

The community based solid waste management has not been defined and implemented.

2.7.8. INTEGRATION WITH MUNICIPAL SOLID WASTE MANAGEMENT SYSTEM

At the moment, this site is not served by district solid waste management service. Thus, there is no clarity yet of how recyclable waste will be managed and how waste residues will be transported to TPA

2.7.9. ADDITIONAL INFO

Most households still have no proper sanitation, they use 'cubluk²' to defecate, or use the rivers. Clean water is coming from water spring which is piped to houses.

² Cubluk is a hole built on the ground to function as latrine
ENVIRONMENTAL SERVICES PROGRAM WWW.ESP.OR.ID

2.8. DARA ULIN, BANDUNG

The communal septic tank program of ESP is located in RW 6, with about 450 households living in peri-urban area of Desa Nanjung, Kecamatan Marga Asih. ESP cooperates with local NGO named WPL (Warga Peduli Lingkungan) which had started with planting (greening) program in this area. Physical construction of communal septic tank has been completed, and 70% of community organizing activities have been finished. Compared to condition before the program, the behaviour change has been encouraging. Now, 60% of targeted houses (about 200 of them) are connected to communal septic tank. However, drainage has become a new problem, as some of grey-water flow is also flowing to the septic tank, resulted in over capacity of the facility.

2.9. KELURAHAN WONOKROMO, SURABAYA

2.9.1. BACKGROUND INFO

RW 06 in Kelurahan Wonokromo is located in urban area with averegly middle low income residents living in permanent houses. There are 1200 households in RW 06, but the program was focused on 60 households who are most willing to participate.

2.9.2. PROGRAM PHASE

The community based solid waste management program in this area has been started since September 2005. It has been developed and implemented, and now in the process of phasing out facilitation of ESP. The community has shown awareness and proven to be able to sustain the system.

2.9.3. DRIVING FORCE

This area was chosen for its high challenges in term of environmental condition. Increased negative impacts of littering, drainage clogging, and burning of waste was more and more common for the community. Flooding was often happened, and even many of the community, at that time, used the flood to get rid of their solid waste by throwing it to the flowing water.

2.9.4. COMMUNITY FACILITATION

Joint facilitation of ESP, Uli Peduli, and local government was made. A forum named KOMPOS was established, which also involved numbers of local NGOs, to assist the community in the whole process of community based solid waste management as well as for awareness rising.

Cadres recruitment – who are mostly housewives – , inauguration (with Walikota), capacity building, comparative study and socialization to community were also facilitated by the team. Provision of individual composter (Takakura), waste carts, and waste bins were undertaken to support the program. The joint team also encouraged active involvement of the community in finding market of recyclable waste.

2.9.5. COMMUNITY INVOLVEMENT

In the starting phase, the cadres actively picked up recyclable/anorganic waste door to door from their closest houses, and sometimes even stimulated with small prizes for those giving highest amount of recyclables. Now, it is the community who bring their recyclable anorganic waste to the cadres. Sometime the cadres also accept organic waste to be composted. Cadres then classify the recyclable wastes every Saturday and coordinate with waste peddler (pengepul) for the selling.

Each cadre is responsible for monitoring 10 houses close to their home, to keep supporting the solid waste and cleanliness program. Head of RT coordinates waste residue collection to be transferred to trucks of Dinas Kebersihan. Waste fee of Rp. 3000 is applied to the residents for regular payment of operator for this residue collection.

2.9.6. SOLID WASTE MANAGEMENT DEVELOPED/PLANNED

The system has applied segregation of organic/anorganic from houses, composting, and sorting and selling of recyclable materials. It has also started selling of hand-made crafts (bag, lamp, wallet, etc) from collected reusable waste e.g. noodle wraps, mineral water bottles, straws, etc. Regular clean-up kampong is organized by cadres and RW to clean gutter and sometimes the river nearby. Greenery program has already started as part of local government instruction, and now is continued and diversified to planting of medicine herbs (TOGA).



Figure 8 Storage room of recyclables



Figure 9 individual composter called Takakura

The solid waste management facilities used include segregated waste bins along the river, individual composter (Takakura) for cadres, and waste carts. These are provided by local government. The community provides a storage room for the 'ready stock' of sorted recyclable solid waste, to be sold to the peddlers. There has been a good relationship with this network, and no conflict so far with the scavengers. The produced compost is not sold, but they utilized it for their plants instead.

2.9.7. ATTAINMENT

Wonokromo program has demonstrated good result, as could be seen in improved awareness and creativity of the community, especially the women cadres, to manage their anorganic waste and gain economic benefit of it. The housewife cadres explained that behaviour change of the community has been shown for the last one year implementation. Littering, gutter clogging, waste burning have decreased, while waste segregation and composting have continued implemented by them. Approaches to other non-cadre housewives are still undertaken, to widen up the ideas of the good practice.



Figure 10 Community members showing handcraft products from garbage

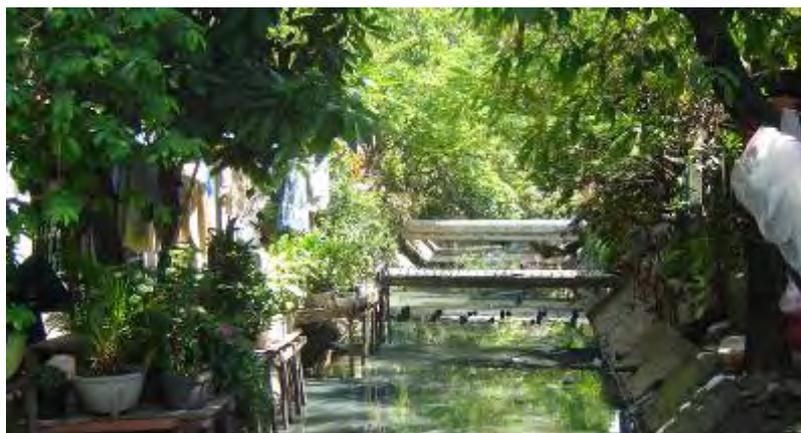


Figure 11 Greening in Wonokromo river

Selling of recyclable waste and hand-made craft from reusable waste has resulted so far of more than Rp. 1.2 million from over 3500 kg. It was also calculated that the reduction amount of solid waste disposed to the TPS has reached 1 – 1.5 m³/day.



Figure 12 River in Wonokromo before the program



Figure 13 River in Wonokromo after the program

Although littering still exist in some areas and not all area has shown contrast changes of environment, based on these photos, it was believed that cleaner gutter and river has been achieved.

2.9.8. INTEGRATION WITH MUNICIPAL SOLID WASTE MANAGEMENT SYSTEM

The program is fully supported by local government, and recognized as part of waste reduction to the final disposal. Waste residue (rubber, etc) is transported to TPA by city trucks regularly.

2.9.9. ADDITIONAL INFO

The majority of the residents has individual toilet. Some also equipped with septic tanks. Clean water is supplied by PDAM

2.10. KELURAHAN GADING, SURABAYA

2.10.1. BACKGROUND INFO

RW 17 in Kelurahan Gading is located in urban area with averegly middle low income residents living in permanent houses. It consist of 18 RTs, with total residents about 1500 households.

2.10.2. PROGRAM PHASE

Community based solid waste management program is now in a start up period. World Vision has started earlier with implementation of economy, health and nutrition program for this community since 2005.

2.10.3. DRIVING FORCE

Almost the same with Wonokromo, the community in this area also suffer from flooding and increased negative impacts of littering, open dumping, and burning of waste. Challenges lie for this newly started program in Tambak Sari, Kelurahan Gading. Although the site illustrates relatively high level of difficulty, where several dumping sites located in the areas, and river is very polluted with garbage, there is a growing awareness in the community to improve their quality of living environment. Some micro-industries take place, which could be beneficial if linked to SWM improvement plan.



Figure 14 Open dumping site in RW 17



Figure 15 women tried to push garbage to follow the river flow

2.10.4. COMMUNITY FACILITATION

Community groups for World Vision program has been established and facilitated by this NGO. The community based solid waste management program facilitation has also started by ESP through socialization to cadres and community. Training/capacity building will soon be conducted. There are 35 cadres recruited for 1 RW for this program.

2.10.5. COMMUNITY INVOLVEMENT

It is expected that the community involve in the same way of Wonokromo system, where household segregation take place and women cadres actively pick up recyclable waste door to door, sort them, and sell to waste peddler.

The existing system applies that RT is responsible to coordinate trash collection to TPS by waste collectors (petugas sampah). These collectors usually also sort and sell the recyclable waste to the peddler for their additional income. Waste fee of Rp. 3000 - 4000 is charged to the community for this primary collection.

2.10.6. SOLID WASTE MANAGEMENT DEVELOPED/PLANNED

Household waste segregation and sorting of recyclable waste have started the implementation. Composting is also desired, but not yet applied. Every two months, clean up gutters/drainage is organized by local government. While greenery program was once initiated (million trees program), but stopped due to lack of space in the area. Waste bins are mostly provided by community, although some are provided by local government. The community also provides waste carts to bring the collected waste to TPS. Networking takes place as the recyclable waste is sold to peddler (pengepul).

2.10.7. ATTAINMENT

Solid waste segregation has been applied, but still limited to cadres. Sorting of recyclable waste is also still limited to RT 9 (about 25 housewives participated), where one cadre, Ibu Sukanto, is willing to allocate his place for temporary storage for the recyclables. Small amount of money is earned from this recyclable waste selling. However, she is now worried of limited land available for recyclables storage. One of the program challenges is some open dumping sites exist in this residential areas, in some marginal plots between the houses. Solving this challenge will be a significant attainment of the program.

2.10.8. INTEGRATION WITH MUNICIPAL SOLID WASTE MANAGEMENT SYSTEM

The existing system apply that mixed waste in TPS has been regularly picked up by truck of Dinas Kebersihan.

2.10.9. ADDITIONAL INFO

The majority of the residents has individual toilet. Some also equipped with septic tanks. Clean water is supplied by PDAM

2.11. KELURAHAN JAMBANGAN, SURABAYA

2.11.1. BACKGROUND INFO

Community based solid waste management in Surabaya city has shown an encouraging development. Jambangan – a green and clean awarded area – apparently has motivated other areas to replicate its community based solid waste management model. There are 23 RTs located in urban area in Kelurahan Jambangan participate in this program under facilitation of Yayasan Uli Peduli, Unilever. They are averagely middle income residents living in permanent houses. Although this site is not part of ESP program site, it is considered as a best practice example to be learned of.

2.11.2. PROGRAM PHASE

Uli Peduli's facilitation to the program is now completed and being evaluated/monitored. The community has shown awareness and proven to be able to sustain the SWM system. They have also become a reference success story for other CBSWM program, even in other cities.



Figure 16 Wall painted by the community to support the clean and green award

2.11.3. DRIVING FORCE

Before the program, the area was suffered from increased negative impacts of littering, gutter clogging due to solid waste. There were once Chikungunya epidemic spread out in the neighborhood when the program was initiated.

2.11.4. COMMUNITY FACILITATION

In the beginning, Uli Peduli started with bigger project area scope (one kecamatan), but failed to be effective. Then it was focused to 23 RTs.

Community consultation, cadres recruitment, capacity building, and socialization to community were undertaken. One community motivator was assigned for each RT, but now, as the community has shown progressive awareness, only one motivator was assigned for one RW. Provision of communal composter (120 L drum) and individual composter (Takakura) were also facilitated by Uli Peduli.

2.11.5. COMMUNITY INVOLVEMENT

The involvement of the community is almost the same with Wonokromo, as Jambangan is its reference. The housewife cadres checked waste segregation to households every two weeks. They initially picked up recyclable waste door to door. But after 2 months, it was

the community gave to them instead. The community applies multilevel marketing concept for monitoring of solid waste management and cleanliness program. One cadre is responsible for 10 households. The cadres also have contributed to kindergarten children education, by teaching about environmental awareness in pre-school.

Each RT is responsible for coordination of waste residue collection. They charge households waste fee of Rp. 3000 for this residue collection service, to pay the monthly salary of waste collectors.

2.11.6. SOLID WASTE MANAGEMENT DEVELOPED/PLANNED

The 3R system applied is similar to Wonokromo, although now they are more advanced in hand-made crafts from reusable waste and medicine planting.

Clean-up kampong was conducted by cadres at the early phase, while greenery was started before Uli Peduli program. Each house was obliged to have 5 plants and TOGA for each RT. The community has regularly set up schedule for watering TOGA.

The community received solid waste management facilities including segregated waste bins along the river provided by local government, individual composter (Takakura) for cadres provided by Puskota, and communal composter (120 L drum) provided by Uli Peduli. Storage room for sorted recyclable waste however is provided by the community.

The same with Wonokromo, recyclable waste is sold to waste peddlars (pengepul), while compost is utilized by themselves.



Figure 17 Women cadre showing the communal composter

2.11.7. ATTAINMENT

Littering, gutter clogging, and waste burning habits have significantly decreased in this neighborhood, while waste segregation and composting is continued implemented. The community also has benefited from selling of recyclable waste, traditional medicine plants (Mahkota Dewa, Roselli, etc), and hand-made craft from reusable waste. Some RTs have also

been nominated for Green and Clean Award and received prizes from local government. Waste disposal to TPS, which was initially done everyday, has proven also to be reduced to every 2-3 days.

2.11.8. INTEGRATION WITH MUNICIPAL SOLID WASTE MANAGEMENT SYSTEM

The program is fully supported by local government, and recognized as part of waste reduction to the final disposal. Waste residue (rubber, etc) is transported to TPA by city trucks regularly.

2.11.9. ADDITIONAL INFO

The majority of the residents has individual toilet. Some also equipped with septic tanks. Clean water is supplied by PDAM

3. FORMULATING CHALLENGES AND RECOMMENDATIONS

In general, it was learned that community preparation for implementing a community based solid waste management – both improvement and new program – highly requires institutional building among the community members. This includes (i) division of roles and responsibility of individuals, operating groups, and coordinating group, (ii) fairness and transparency during community based solid waste management phases, and (iii) good approach in communication (as we noted that this is a learning and growing process), as part of trust building requirement during the facilitation.

In particular, these specific issues are concluded:

3.1. DEPENDENCY TO MUNICIPAL SOLID WASTE SERVICE

Solid waste secondary collection and transportation from temporary disposal site (TPS) to final disposal site (TPA) are always needed. Even for a high recycling rate and very efficient community based solid waste management, there is always small portion of residues left.

Challenges in visited sites:

The progress of community participation is faster than promised infrastructure development by the municipality. It has resulted in overloaded transfer points, which may subsequently discourage the community to sustain community based solid waste management
Some sites (especially tidal areas) are suffered from heavily polluting waste from other places

Opportunities/recommendations:

Legislation in place to clarify solid waste management services and schemes committed by both community and municipality level
Joint assessment between the community and local authority concerning solid waste flow in relation to local hydrology profile

3.2. CERTAINTY OF WASTE MATERIAL FLOW

Segregation is certainly the key on getting into efficient solid waste management. What happen next to the segregated waste is yet uneasy to decide. Community should be facilitated not only to improve their knowledge and ability to perform 3R principles, but also to decide the subsequent process. Certainty of how the ‘waste loop’ is closed usually

comprises: (i) compost utilization for greening, (ii) selling of recyclable materials, and (iii) transfer of waste residue by city trucks to final disposal site.

Challenges in visited sites:

Recycling business network is either non-existence or not easily accessible in the area
Municipal service do not reach the area

Opportunities/recommendations:

Sister village concept
Cooperate with existing scavengers and waste collectors for selling of recyclables. The selling revenues can be used as additional income for the community.
Greening campaign and medicine planting program

3.3. WILLINGNESS TO PARTICIPATE

How to motivate the community is varied. In most cases, the participation is initially low. Majority of the residents do not follow the scheme until they believe it is proven to be benefited for them. Early phase (usually the first 2-3 months) demands extra efforts of the minority to keep maintaining and promoting the schemes.

Challenges in visited sites:

Improved health and environmental benefits are not really interesting especially for the poor. They have been living in dirty and unhealthy environment for quite a while.
People want shortcoming benefits (i.e. money) and perceived that clean and green environment is something impossible

Opportunities/recommendations:

Incentives/door prizes for those who participate in the schemes at the early phase
Select strongly committed cadres (usually housewives) who are willing to sacrifice their time and energy
Continuous education and awareness raising on the importance of waste collection and recycling with respect to health, environmental, economic and social benefits
Creative ideas to reuse waste materials to produce bags, table mat, lamps, etc are beneficial to become additional income for the community. So is the idea of medicine plants garden

3.4. TECHNICAL OPERATION

Solid waste management scheme requires adequate space, equipments, and trained people to run it. Composting process often requires trial and error before the community understand and able to operate/maintain. To be efficient, it is essential to have an affordable and user-friendly system, especially since most of the users of solid waste management facility are women.

Challenges in visited sites:

Available space for recyclable sorting/storage and composting is often lacking
Housewives found difficulties to operate the communal composter drum

Opportunities/recommendations:

Purchasing additional tools such as shovels to improve effectiveness of communal composting
Improve understanding of technical-operational aspect, such as differences between composting of agricultural waste and domestic solid waste
Household composter such as Takakura model that could be located inside the house

3.5. EFFECTIVE CLEANLINESS AND GREENERY PROGRAM

In all success stories, 3R practices are always coupled with effective and participative clean-up kampong (kerja bakti) and greenery. Effective community mobilization often depends on enforcement from the local leaders such as Lurah, RW or RT.

Challenges in visited sites:

People do not feel a sense of ownership toward the cleanliness of their environment
Individuals find cleaning gutters, rivers, and streets unpleasant work and time consuming

Opportunities/recommendations:

Stimulate community mobilization through clean and green award/competition
Share responsibilities among the community on watering plants/gardens
Multilevel monitoring system on keeping the nearest houses clean and green

APPENDIX – COMMUNITY BASED SOLID WASTE MANAGEMENT ASSESSMENT SHEET

Specific element	Location		
	Deli Serdang	Medan	Medan
	Desa Tembung	BAPOR Lingk 4 Belawan	Sunggal
1 Background info			
Socio-demographic	Middle-low income; permanent houses	Low income; temporary wooden houses of stilts (rumah panggung)	Low income; semi permanent houses
Location	3 pilot streets in Dusun 11; peri-urban area along Percut River	Peri urban; fisherman village in tidal areas (daerah pasang surut)	Peri urban
2 Program phase	SWMS developed, and being implemented	SWMS developed, and being implemented	SWMS developed, and being implemented
3 Driving force	Flood control program in Percut River initiated by the Gov't and DAS conservation program of ESP	Decreased fish catchment	Flooding impact
	Increased negative impacts of littering, burying and burning of waste	Heavily polluted environment (garbage, human feces, etc mixed with water under the houses)	Increased negative impacts of littering, burying and burning of waste
4 Community facilitation	Community assistance by BIS Peduli	Community assistance by BIS Peduli	Community assistance by SMI
	Community organizers (MAPEL): establishment and capacity building	Bank Sampah establishment	Capacity building and socialization to cadres and community

**COMPARATIVE ASSESSMENT COMMUNITY BASED SOLID WASTE MANAGEMENT (CBSWM)
MEDAN, BANDUNG, SUBANG AND SURABAYA**

Specific element	Location			
	Deli Serdang	Medan	Medan	
	Desa Tembung	BAPOR Lingk 4 Belawan	Sunggal	
	Socialization to women cadres, youth organization, religious groups	Socialization to cadres and community	Provision of composter	
	Finding market of recyclable plastic and compost	Finding market of recyclable plastic and compost	Finding market of recyclable plastic and compost	
5	Community involvement			
	Roles/responsibility shared	Women cadres apply and promote waste segregation	Women cadres apply and promote waste segregation	Women cadres operate communal composting
		MAPEL collect the segregated waste regularly, compost the organic waste, and coordinate with BIS Peduli for anorganic waste	Community organizer collects the segregated waste regularly, compost the organic waste, and coordinate with BIS Peduli for anorganic waste	
			Bank Sampah compensates money for agreed recyclable materials	
	Self-funding agreed	No fees applies. But willing to pay if could improve cleanliness	No fees applied	No fees applied
6	SWMS developed/planned			
	3R applied	Waste segregation at households, composting, sorting of recyclable waste	Waste segregation at households, composting, sorting of recyclable waste	Waste segregation at households, composting, sorting of recyclable waste
	Clean up kampung (kerja bakti)	Regularly organized by MAPEL	Conducted, but not regularly	Limited to SPS
	Greenery	Not yet programmed. Just individual initiatives	Not yet programmed. Just individual initiatives	Not yet programmed. Just individual initiatives

**COMPARATIVE ASSESSMENT COMMUNITY BASED SOLID WASTE MANAGEMENT (CBSWM)
MEDAN, BANDUNG, SUBANG AND SURABAYA**

Specific element		Location		
		Deli Serdang	Medan	Medan
		Desa Tembung	BAPOR Lingk 4 Belawan	Sunggal
	Facilities	Sacks as segregated waste containers provided by community	Segregated waste basket provided by households	Communal composter using 120 L drum provided by ESP
		Waste cart (becak) for collecting provided by community	Composter (using rattan basket and polybag plastic) provided by community	
		Concrete waste boxes near the river provided by JBIC program		
		2 windrow (piles) for composting. <u>Note:</u> correction of technical process needed		
	Networking	Sister village concept: plastic washing in Marelán and compost for cacao farmers	Sister village concept: plastic washing in Marelán and compost for cacao farmers	Sister village concept: plastic washing in Marelán. But compost is utilized by themselves
7	Attainment			
	Behaviour change	Littering, waste burying, waste burning have decreased	Some have applied waste segregation and participated in composting	Some have applied waste segregation and participated in composting
	Selling revenues	Not yet, but plan to have it from compost and plastic	Not yet, but plan to have it from compost and plastic	Not yet, but plan to have it from compost and plastic
	Clean and green environment	Not yet. Areas near the river have become unorganized dumping site	Not yet. The water under houses are still overburdened with waste (garbage and human feces)	Not yet. Littering still takes place
	Waste reduction	Not yet calculated	Not yet calculated	Not yet calculated

**COMPARATIVE ASSESSMENT COMMUNITY BASED SOLID WASTE MANAGEMENT (CBSWM)
MEDAN, BANDUNG, SUBANG AND SURABAYA**

Specific element		Location		
		Deli Serdang	Medan	Medan
		Desa Tembung	BAPOR Lingk 4 Belawan	Sunggal
8	Integration with municipal SWMS	No clarity of how waste collected near the river will be transported to TPA	Residue (glass, rubber, etc) is transported to TPS near traditional market	Residue (glass, rubber, etc) is transported to TPS near the main road
		The program is supposed to be linked with provision of hardware by JBIC-Gol	Some of the waste is suspected from other areas (upper-stream water flow)	
9	Additional info			
	Watsan facilities	'Cubluk' latrines. Clean water from PDAM	No toilet/sanitation, wastewater directly to water under the houses. Clean water from deep well.	Toilet in some houses, but majority not. Clean water from new communal water tap provided by ESP.

**COMPARATIVE ASSESSMENT COMMUNITY BASED SOLID WASTE MANAGEMENT (CBSWM)
MEDAN, BANDUNG, SUBANG AND SURABAYA**

Specific element	Location	
	Bandung	Subang
	Tamansari	Cisusuk - Cijambe
1 Background info		
Socio-demographic	Middle-low income (RW 15), middle income (RW 20); permanent houses	Low income; permanent houses
Location	RW 15 and 20; urban area along Cikapundung River	RW 07; rural area
2 Program phase	Initiation period. Baseline SWMS has been surveyed and field assistance will be started soon	Initiation period. Baseline SWMS has been surveyed and field assistance will be started soon
3 Driving force	DAS Cikapundung conservation program initiated by ESP	DAS Cipunegara conservation program of ESP
	Impact of TPA Leuwigajah disaster	Increased negative impacts of littering, burying and burning of waste
		Critical land rehabilitation program
4 Community facilitation	Community assistance by KUJBS will be started	Community groups of plantation, nursery, farming has been established and facilitated by WSM and MAPAS
	Capacity building and socialization to cadres and community has been started	Capacity building and socialization to cadres and community has been started
	Finding market of recyclable waste will be facilitated	Finding market of recyclable waste and waste residue transportation to TPA will be facilitated
5 Community involvement		
Roles/responsibility shared	Not yet defined. Existing: RT coordinates mixed waste collection. Some operator (petugas sampah) sort and sell the recyclable waste	Women cadres have demonstrated waste segregation day event
		Community leader will compost the organic waste using windrow system
Self-funding agreed	Waste fee Rp. 1000 - 3500 per month per household is collected by RT staff	No fees applied
6 SWMS developed/planned		
3R applied	No segregation or composting yet. Sorting of recyclable waste is done by scavengers/waste operators.	Not yet. But waste segregation has been introduced to women cadres
Clean up kampung (kerja bakti)	Regularly organized by RW	Once a month on Friday

**COMPARATIVE ASSESSMENT COMMUNITY BASED SOLID WASTE MANAGEMENT (CBSWM)
MEDAN, BANDUNG, SUBANG AND SURABAYA**

Specific element		Location	
		Bandung	Subang
		Tamansari	Cisusuk - Cijambe
	Greenery	Not yet programmed. But many households have initiated (especially RW 20)	Being performed as part of GERHAN program of plantation, nursery, and organic farming
	Facilities	Segregated waste bins provided by local government. <u>Note</u> : the collected waste is still mixed	No provision of facilities. Segregated plastics were provided during waste segregation day
		TPS provided by local government	
	Networking	Not yet defined. Recyclable waste is sold by the scavengers	Not yet defined for recyclable waste. But compost will be utilized by themselves
7	Attainment		
	Behaviour change	Not yet applied	Not yet applied
	Selling revenues	Not yet applied	Not yet applied
	Clean and green environment	Not yet applied	Not yet applied
	Waste reduction	Not yet applied	Not yet applied
8	Integration with municipal SWMS	Mixed waste in TPS has been regularly picked up by truck of PD Kebersihan	On-going facilitation to clarify how recyclable waste will be managed and how waste residues will be transported to TPA. Residues are still burnt in open areas.
9	Additional info		
	Watsan facilities	Majority has individual toilet. Clean water from PDAM	'Cubluk' latrines or open defecation in river. Clean water from water spring piped to houses.

**COMPARATIVE ASSESSMENT COMMUNITY BASED SOLID WASTE MANAGEMENT (CBSWM)
MEDAN, BANDUNG, SUBANG AND SURABAYA**

Specific element	Location		
	Surabaya	Surabaya	Surabaya
	Wonokromo	Gading - Tambak Sari	Jambangan
1 Background info			
Socio-demographic	Middle low income; permanent houses	Middle low income; permanent houses	Middle income; permanent houses
Location	RW 06; urban area	RW 17; urban area	23 RTs; urban area
2 Program phase	Program completion, SWMS implementation continued	Start up period for SWM-ESP. World Vision has started with economy, health and nutrition program	Uli Peduli program: completion and evaluated/monitored, SWMS implementation continued
3 Driving force	Flooding	Flooding	Chikungunya epidemic
	Increased negative impacts of littering, drainage clogging, and burning of waste	Increased negative impacts of littering, open dumping, and burning of waste	Increased negative impacts of littering, gutter clogging
		Middle low income; permanent houses	Middle income; permanent houses
4 Community facilitation	Joint facilitation of ESP, Uli Peduli, and local government established Forum KOMPOS	Community groups for World Vision program has been established and facilitated by WV	Uli Peduli initially started with bigger area scope
	Cadres recruitment, inauguration (with Walikota), capacity building, comparative study and socialization to community	SWMS socialization to cadres and community. Capacity building will soon be conducted	Community consultation, cadres recruitment, capacity building, and socialization to community
	Provision of individual composter (Takakura), waste carts, waste bins		Provision of communal composter (120 L drum) and individual composter (Takakura)
	Finding market of recyclable waste		

**COMPARATIVE ASSESSMENT COMMUNITY BASED SOLID WASTE MANAGEMENT (CBSWM)
MEDAN, BANDUNG, SUBANG AND SURABAYA**

Specific element	Location			
	Surabaya	Surabaya	Surabaya	
	Wonokromo	Gading - Tambak Sari	Jambangan	
5	Community involvement			
	Roles/responsibility shared	Cadres accept recyclable waste from community. Some even accept organic waste to be composted. Note: during starting phase, cadres actively picked up recyclable waste door to door and stimulate with small prizes	Women cadres actively pick up recyclable waste door to door, sort them, and sell to pengepul.	Women cadres checked waste segregation compliance to households twice a week. They initially picked up recyclable waste door to door. But after 2 month, the community give to them instead.
		Cadres grouped recyclable waste every Friday and coordinate with buyer (pengepul) for selling	RT coordinates collection to TPS. Some operator (petugas sampah) sort and sell the recyclable waste	One cadre responsible for 10 households (similar to MLM).
		Each cadre monitors 10 houses to keep supporting the program		Cadres contributes to children education on environment
		RT coordinates waste residue collection		RT coordinates waste residue collection
	Self-funding agreed	Waste fee Rp. 3000 applied for residue collection	Waste fee Rp. 3000 - 4000 applied for collection to TPS	Waste fee Rp. 3000 applied for residue collection
6	SWMS developed/planned			
	3R applied	Waste segregation at households, composting, sorting of recyclable waste, hand-made crafts (bag, lamp, wallet, etc) from reusable waste	Waste segregation at households, sorting of recyclable waste have started. Interest for composting, but not yet applied.	Waste segregation at households, composting, sorting of recyclable waste, hand-made crafts from reusable waste
	Clean up kampung (kerja bakti)	Regularly organized by cadres and RW to clean gutter and sometimes the river	Every 2 months clean up gutters/drainage organized by local government	Conducted by cadres at the early phase
	Greenery	Program continued, and diversified to medicine plants (TOGA)	Was once initiated (million trees program), but stopped due to lack of space	Started before Uli program. Each house was obliged to have 5 plants, and TOGA for RT. Set up schedule for watering TOGA.

**COMPARATIVE ASSESSMENT COMMUNITY BASED SOLID WASTE MANAGEMENT (CBSWM)
MEDAN, BANDUNG, SUBANG AND SURABAYA**

Specific element	Location		
	Surabaya	Surabaya	Surabaya
	Wonokromo	Gading - Tambak Sari	Jambangan
Facilities	Segregated waste bins along the river provided by local government	Waste bins mostly provided by community, some provided by local government	Segregated waste bins along the river provided by local government
	Individual composter (Takakura) for cadres provided by local government	Waste carts provided by community	Individual composter (Takakura) for cadres provided by Pusdakota
	Waste carts provided by local government		Communal composter (120 L drum) provided by Uli Peduli
	Storage room for sorted recyclable waste provided by the community		Storage room for sorted recyclable waste provided by the community
		Recyclable waste is sold to peddler (pengepul)	Recyclable waste is sold to peddler (pengepul). Compost is utilized by themselves
Networking	Recyclable waste is sold to buyer (pengepul). Compost is utilized by themselves	Not yet defined for recyclable waste. But compost will be utilized by themselves	Recyclable waste is sold to buyer (pengepul). Compost is utilized by themselves
7 Attainment			
Behaviour change	Littering, gutter clogging, waste burning have decreased; waste segregation and composting is continued implemented	Cadres have applied waste segregation	Littering, gutter clogging, waste burning have decreased; waste segregation and composting is continued implemented
Selling revenues	From recyclable waste (more than Rp. 1,2 million from over 3500 kg), and hand-made craft from reusable waste	From recyclable waste	From recyclable waste, traditional medicine plants (Mahkota Dewa, Roselli, etc), and hand-made craft from reusable waste
Clean and green environment	Cleaner gutter and greener street; decreased garbage in the river. Littering still exist in some areas	Not yet. Some open dumping sites exist	Nominated for Green and Clean Award and receive prize from local gov't
Waste reduction	1 – 1.5 m3 per day reduction	Not yet calculated	Daily collection to TPS reduced to every 2-3 days

**COMPARATIVE ASSESSMENT COMMUNITY BASED SOLID WASTE MANAGEMENT (CBSWM)
MEDAN, BANDUNG, SUBANG AND SURABAYA**

Specific element		Location		
		Surabaya	Surabaya	Surabaya
		Wonokromo	Gading - Tambak Sari	Jambangan
8	Integration with municipal SWMS	Waste residue (rubber, etc) is transported to TPA regularly	Mixed waste in TPS has been regularly picked up by truck of PD Kebersihan	Waste residue (rubber, etc) is transported to TPA regularly
		Full recognition and support of local government		Full recognition and support of local government
9	Additional info			
	Watsan facilities	Majority has individual toilet. Some has septic tanks. Clean water from PDAM	Majority has individual toilet. Some has septic tanks. Clean water from PDAM	Majority has individual toilet. Some has septic tanks. Clean water from PDAM

ENVIRONMENTAL SERVICES PROGRAM

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