

COMMUNITY INITIATIVES IN SOLID WASTE REDUCTION, SUKUNAN VILLAGE, SLEMAN, YOGYAKARTA, INDONESIA

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abstract

Sukunan is a village in suburban area, located around 5 kilometers west of Yogyakarta's city center. Before the community based waste management program was started in Sukunan, most of villagers burned, buried and disposed their waste on nearby unused plots of land or simply tossing it in irrigation canal and river to be carried away. In 2000 Sukunan farmers - fed up clearing trash carried by irrigation canal onto their rice fields - held the village meeting about the problem of plastic and other rubbish they were constantly finding strewn in their paddy fields.

As a community member and academic, I felt an overwhelming sense of responsibility to do something. In 2002, I carried out a simple observation research to scavenger's activities in the Yogyakarta landfill site. I found that certain waste - plastic, paper, metal-glass- had significant economic value because they could be collected and sold to recycling plants. Beside that, I also did a simple experiment to solve the organic waste. I got a simple composting method with clay pots. Meanwhile my wife made some handicraft items from plastic sachets waste. Then I arranged a community based waste management system in 2003.

Therefore my family began separating the household waste into 4 categories: plastic; paper; glass & metal; and organic. After 3 months, I sold the plastic paper-glass & metal waste to buyer (garbage traders) and I used the compost for plant fertilizer. I started to share my idea with other people and some leaders in the village. In January 2004, a Sukunan's waste management team was established. The team and Sukunan leaders introduced the system to all people through many strategies and methods, such as demonstrations, games, competition, songs, poems, discussion, training, writing, diagrams, leaflets, appeal letters, face to face and other socially empowering approaches. The Sukunan youth has made and painted bins for separation rubbish. When earthquake of May 2006 was happened, which destroyed several houses in Sukunan, the community initiated to reuse Styrofoam from electronic packaging into bricks. Made from one part cement, three parts sand and three parts granulated Styrofoam, bricks were molded and dried in the sun, then used to rebuild five houses.

For reducing the solid waste, Sukunan women also made environmentally friendly sanitary napkin for women (reusable) from cotton. Beside that the waste management team campaigned to avoid producing no-recycle and no-reuse items. The Sukunan's program generated income for community and the village. There are now opportunities to run community businesses, such as making handicrafts, producing compost, producing Styrofoam bricks & plant pots, collecting and selling rubbish, establishing recycling facilities and running a business training centre.

Many people from other areas visited Sukunan for learning the solid waste management system. They have attempted to replicate Sukunan's recycling-reusing-reduction (3R) program in their areas. Both Ministry of Environment and Ministry of Public Work have published that Sukunan's community based waste management program was included as the best practice for solid waste management in Indonesia since 2006. Now, more than a hundred villages in Yogyakarta and Central Java Province have replicated the Sukunan waste management system.

Key words: Sukunan, community, waste management, separate, recycling, reduction

1.0 Introduction

Sukunan is a sub-urban village, around 5 km west of city centre of Yogyakarta Province. Sukunan consist of 5 neighbourhoods, 312 families and 1045 people. There are 65 farmers. Sukunan is surrounded by rice fields. In 2000, Sukunan farmers complained about the increasing amount of rubbish, especially plastic. The rubbish entered their rice fields and destroyed rice plants. Plastic rubbish often penetrated the soil and disturbed the roots. Therefore their rice could not grow well. Most Sukunan people at that time did not manage their rubbish.

Before the community based waste management program was started in Sukunan, most of villagers burned, buried, and disposed their garbage on nearby unused plots of land or simply tossing it in irrigation canal and river to be carried away. Some families whose houses without vacant land confused to manage their rubbish, because they have not got a government waste management service like in the city. Sukunan then looked dirty. Rubbish could be found anywhere. It was an uncomfortable view and also an unhealthy environment. In rainy season, some rubbish such as bottle, cup, tire, etc. can be filled by raining water. The mosquitoes of dengue fever breed in clean water. The cases of dengue disease happened almost every year in Sukunan.

Besides, most people burnt all kinds of rubbish including plastic, styrofoam, rubber, etc. They did not understand the danger for human health. They did not know that the burning rubbish bring out many toxic materials, such as dioxin. Dioxin is a super toxin and a carcinogenic material that can cause cancer, asthma, respiratory and cerebral diseases.

2.0 Establishment of Sukunan's Waste Management System

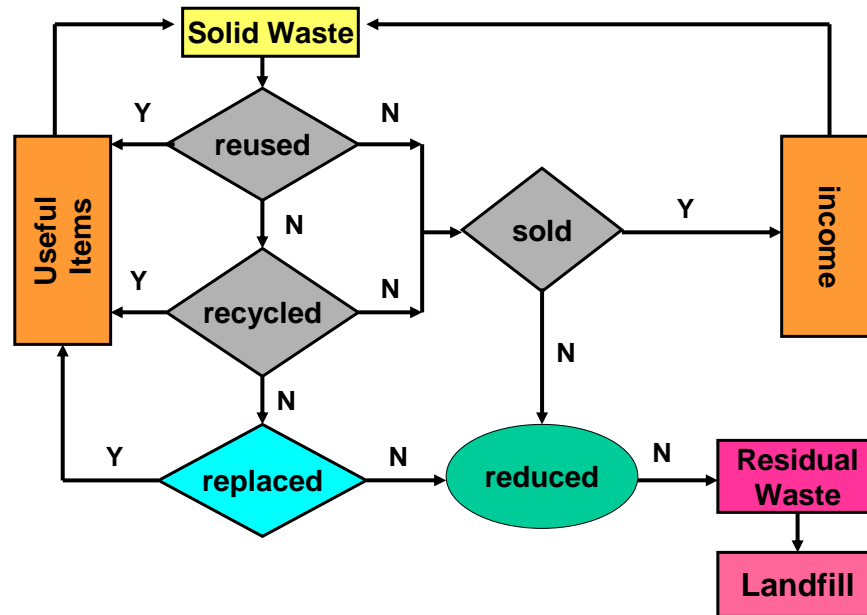
Considering many waste problems had encouraged Sukunan people to seek an appropriate solution. As a community member and academic, I felt an overwhelming sense of responsibility to do something. In 2002, I carried out a simple observation research to scavenger's activities in the Yogyakarta landfill. Many people worked in landfill sites. They saw the rubbish as a valuable commodity. They picked and separated plastic, paper, metal and glass from the rubbish. Then the rubbish was packed separately based on the kind of rubbish. They sold them to the recycle-able goods traders. Next, the traders sold to recycling factories in Jakarta, Surabaya, Solo, Semarang or other big cities in Indonesia. The conclusion of the observation research is that almost all waste - plastic, paper, metal-glass- had significant economic value because they could be collected and sold to recycling plants. The rubbish can be converted to money by separating it into different kinds of waste and selling it. Thus I had an idea, if every family separated their rubbish, they will be

collecting material of value rather than just waste. Therefore, if families in a village collect their rubbish in a garbage pool, the recycle-able goods trader will pay for the rubbish.

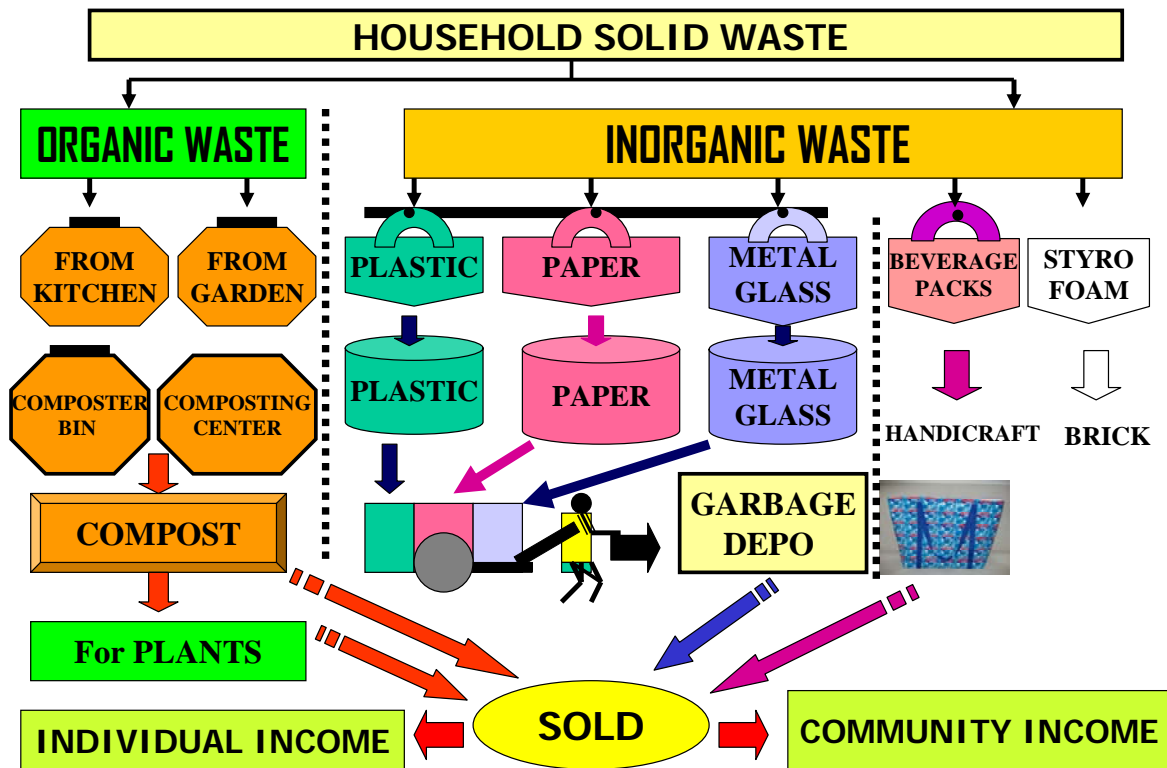
Beside that, I also did a simple experiment to solve the organic waste. I got a simple composting method with clay pots. The research had resulted in a simple composting method. Every family can make the compost easily. Composting is a suitable method to solve the organic waste problem. Compost is an organic fertilizer for plants and can be additional income for the family.

One of many kinds of rubbish that could not be sold to the trader were the packs of food, beverage or detergent. There was not a recycling factory for those rubbish in Indonesia. In 2002, my wife had an idea to change that rubbish into stunning handicraft. She could make many handicrafts such as handbags, pockets, hats, paper-holder, news-shelves, etc. The handicrafts could be used by us or sold too. Then I arranged a community based waste management system in early 2003.

The Basic Idea of Sukunan's Waste Management System



Therefore my family began separating the household waste into 4 categories: plastic; paper; glass & metal; and organic. After 3 months, I sold the plastic paper-glass & metal waste to middleman and I used my compost for plant fertilizer. We had do it first, before we spread the new waste management system to the community. I began to inform many friends and neighbours of my rubbish separation habit at home. I also introduced a simple procedure of making compost to them. Some people in Sukunan started to follow my way in separating rubbish and making compost.



Schema of Sukunan Waste Management System

The new system could only be implemented in Sukunan village very gradually. This is because of most Sukunan people are of low economic status and not well educated. In fact, it is impossible to ask them to buy the waste separation facilities such as bins, clay pots for composting, a cart of rubbish transportation, etc. I started to share my idea with other people and some leaders in the village.

Coincidentally, I met Dr. Lea Jellinek and Ed Kiefer in middle 2003. They are the resident directors of ACICIS (Australia Consortium for in Country Indonesia Studies). After discussing with them, they were interested to solve the waste problem too. They were sad to see such dirty areas anywhere in Yogyakarta. When I visited Lea's home, I saw good garbage management at her house. The family has separated their garbage. They proceeded the organic waste into compost in a ground hole, while the inorganic waste was collected and given to a trash picker. Actually, their habit of separating rubbish in Australia was brought with them to Indonesia. What I observed was really good behaviour. The experience increased my motivation to apply the new waste management system in Sukunan.

3.0 Socialization and Implementation of the Sukunan's Waste Management System

It is very difficult to change a whole community's behaviour. With some friends, I revealed the idea to Sukunan leaders. Not all Sukunan leaders could accept the idea. Some of them were not sure that the program could be run by Sukunan people. They were worried about the continuity of the program. They thought that to change a community habit is very difficult. The failure of the last programs in Sukunan was because the Sukunan people had no role in the programs. It was imposed upon them as the object of the program rather than as their own responsibility, something they can do for themselves. So, they did not have any sense of belonging of the program. Besides, the program leaders often did not give a good example to their community. They were clever in how they spoke about the project, but never did anything. It was "All Talk and No Action." The people did not like it.

Therefore, for the implementation of this new program into the community, other strategies were needed. The community must take the most important role. The program leaders must be chosen by the community. They must be honest. They have to set a good example in their own behaviour. They have to do it first before the community does it.

In January 2004, a Sukunan's waste management team was established. Community chose some members for the team. There are eight persons in the team. The Sukunan leaders and community supported and helped the team.

The first activity of the Sukunan's waste management team was setting up a plan of action for the implementation of the program. Every result of the team meeting was brought to the community in routine meetings. In each meeting, the community discussed the issues and made decisions. Each community was given an important role as part of the program. They could join with the program by way of an idea, support, a solution or as personnel etc.

The team and Sukunan leaders educated and motivated all people (children, adolescents and parents) about the dangers of burning rubbish, the dangers of garbage for human health and the environment, rubbish separating methods, procedure of making compost and a plan of waste management in Sukunan.

The socialization, education and motivation for the people were conducted through many strategies and methods, such as demonstrations, games, competitions, songs, poems, discussions, writing, diagrams, leaflets, appeal letters, face to face and other socially empowering approaches. Through the socialising of the whole program made it easier to understand than only the discourse

method. Children really liked games and competition and what they learnt from that then transfer onto the siblings and parents. Some women leaders helped the team to socialize the program to their members. In each routine women meeting, the leaders always instructed their members as to how to manage their rubbish. They also suggested to them to do 3R-action (reduce, reuse and recycle) in their daily activities.

Meanwhile, my wife also trained some of Sukunan women to make handicrafts from plastic rubbish. They could make handbags, hats, pockets, etc. Sukunan women also had decided where the bins should be placed, so that they are convenient to reach from their houses. Eight groups of women in Sukunan (*dasawisma*) participated in the separating rubbish competition.

The Sukunan youth took many important roles in the program, especially to educate and motivate children. The team and some youth made a slogan of village “Sukunan Bersemi.” Bersemi is an abbreviation of BErsih (clean), Sehat (healthy), Murni (natural) and Indah (beautiful). Beside that, the youth also made a symbol of Sukunan Bersemi. The youth also made 180 rubbish hangers and 66 rubbish bins. Both competition and cooperation, the Sukunan youth has painted all bins. Beautifully painted bins are not only attractive to see, but also functional. They are the places where Sukunan villagers put their daily garbage. There are three bins in each location. Each bin is allocated for a specific kind of rubbish: plastic, paper and metal/glass. We hope the youth will keep the bins, because it was them who made those bins. The youth displayed remarkable artistic talent and enthusiasm for the program. On the other hand, the team prepared 360 clay pots for composting. Together, Sukunan men made cements floors on 22 locations for placing bins, while the Government of Sleman District supported by giving a rubbish chart.

At the time, a motivation song “Sukunan Bersemi” and a poem “*Balada Seonggok Sampah*” (Ballad of the Rubbish Heap) were created. The song is often used in socialization of the program. Many children and women can sing the song well. Besides, the Sukunan leaders created a diagram about Sukunan’s waste management procedure and sent a letter of recommendation to each family.

After that, the socialization of program and preparation of facilities finished, the Sukunan people placed the painted bins on 22 convenient sites around the Sukunan village. They also distributed two clay pots and a rubbish hanger to each house. At that time, they educated and explained the function of each clay pot and rubbish hanger. The new waste management system was ready to be applied in Sukunan.

The Sukunan people began to separate the rubbish into four types: 1) plastic, 2) paper, 3) metal/glass and 4) organic kitchen-waste in each household. Thus, each family put the plastic,

paper, and metal/glass into the appropriate bins. Weekly, a rubbish collector collects the rubbish from the bins to Sukunan's garbage pool. Monthly, Sukunan village could sell the rubbish to the recycle-able goods traders. The income from selling rubbish is used to pay the rubbish collector and to develop the village.

Beside that, Sukunan people also make compost from their organic kitchen-waste. Each family just needs two clay pots for composting. They could put their organic waste into the clay pot everyday. If the first pot was full, the second pot was used. When the second pot was full, the organic waste in the first pot has produced compost. Furthermore, they use the compost as organic fertilizer for their plants or they can sell it too.

4.0 Development of the Sukunan's Waste Management Program to Reduce Non-Recyclable Waste

When earthquake of May 2006 was happened, and destroyed several houses in Sukunan. The Sukunan community initiated to reuse Styrofoam from electronic packaging as bricks. Made from one part cement, three parts sand and three parts granulated Styrofoam, bricks were molded and dried in the sun, then used to rebuild five houses. For reducing the solid waste, Sukunan women also made environmentally friendly sanitary napkin for women (reusable) from cotton. Beside that the waste management team campaigned consistently to community about "three R's action : Reduce, Reuse and Recycle" for waste reduction.

The Sukunan's program generated income for community and the village. There are now opportunities to run community businesses, such as making handicrafts, producing compost, producing Styrofoam bricks & plant pots, collecting and selling rubbish, establishing recycling facilities and running a business training centre

5.0 Spreading of the Sukunan's Waste Management System

The information about Sukunan waste management system is spreading further and further. Kedauletatan Rakyat, a local newspaper in Yogyakarta, published the Sukunan's waste management system. Then, the Jakarta Post, an English language newspaper in Indonesia also published the program entitled "Villagers join hands to save the Earth." Next, Radio of Republic Indonesia in Yogyakarta invited the Sukunan team to explain about the Sukunan waste management program on air. Many other newspaper and magazines in Indonesia, e.g. Bernas, Kompas, Suara Pembaharuan, Nova, Gatra, Sinus, Jogjawara, Kartamantul wrote about the Sukunan waste management system.

Some TV stations, such as Jogja TV, TVRI Yogyakarta, SCTV, MetroTV and TV Trans 7 presented the Sukunan waste management program too.

The Sukunan waste management team is also often invited to many villages, government institutions, private institutions, universities, schools, etc. to share those experiences of the Sukunan waste management program. The team also spread the program by workshop, seminar, community education, etc. The team educates many near and far communities about the waste management and have done so.

Both Ministry of Environment and Ministry of Public Work have published that Sukunan's community based waste management program was included as the best practice for solid waste management in Indonesia since 2006. Many people came from other areas to Sukunan Village for learning the solid waste management system. Generally, they were interested in the program. They wanted to replicate and apply the program to other areas. They have attempted to replicate Sukunan's recycling-reusing-reduction (3R) program in their areas. Now, more than a hundred villages in Yogyakarta and Central Java Province have replicated the Sukunan waste management system. Sukunan became a centre of community based waste management study in Indonesia. The Sukunan villagers are now so very proud of their village.

6.0 Results of the Sukunan's Waste Management Program

6.1 Improvement of Waste Management Awareness and Knowledge

Now, most Sukunan people have known that the garbage is a valuable resource. They have an awareness to separate and recycle the rubbish. They have learnt the composting method, the recycling of rubbish and the danger of burning plastic for human health. Not only youth and parents, but the children have also understood negative impacts and the value of rubbish. The comfortable environment in the village is now becoming a community demand.

For example, the people now know that organic waste from their kitchen can be turned into valuable compost. Many people began to plant various flowers, fruits, herbs, etc. in their vacant land and along the edge of road. They used the compost for fertilizing their plants. Even, some of them sell the compost and the product of their plants. Indirectly, they get additional income from garbage and plants.

6.2 Reducing the Burning of Rubbish and Reducing Pollution

Most Sukunan people (95% of 312 families) had separated their rubbish. All bins (66) had been used by communities for collecting rubbish. Currently, most people do not burn plastic rubbish. The burning of rubbish habit of Sukunan people is becoming less and less. The Sukunan waste management program can totally eliminate the burning of inorganic waste (plastic, paper, metal/glass) of 12 m³ a month. So, the waste recycling program can reduce air pollution enormously.

Most Sukunan people now do not dump the inorganic waste in vacant lands, irrigation canals/rivers or fields. It means the Sukunan's waste management can reduce ground and water pollution. The program is a highly effective strategy to reduce environment pollution generally.

6.3 Reducing of Illegal Dumping Sites

Most Sukunan people separate solid waste and dispose it into each bin or clay pot. They do not confuse to put the rubbish in the wrong container any longer. Nor do they dispose the rubbish into vacant lands, irrigation canals, rivers, long the edge of the road or other illegal dumping sites. It means, the number of illegal dumping sites can be reduced in Sukunan.

Sukunan's environment is now cleaner than it was. The decreasing number of illegal dumping sites can also eliminate social conflicts in the community. The rice field can be kept well away from the inorganic waste. Sukunan farmers are becoming happier and happier. So, they can work intensively.

6.4 Decreasing of Dengue Fever Cases

The Sukunan people now understand that dengue fever has a close relationship with the rubbish. The Sukunan waste management program can eliminate many ideal breeding sites of mosquitoes, such as bottles, cups, tires, tins, etc. Mosquitoes can breed in very small amounts of water. Since 2004, Sukunan has been free from dengue fever. Previously, dengue fever cases were found in Sukunan every year, although the dengue fever cases in Yogyakarta is high. In 2004, dengue fever spread to 138 villages in Yogyakarta Province and attacked to 2,215 people. Thirty of them died.

6.5 Economic Benefits to the Community

The result from selling rubbish can be used to pay for the rubbish collector and the packaging workers. Beside that, Sukunan people do not need to pay the waste management cost. While, people in the other villages must pay between Rp. 10,000 and Rp. 50,000 per family per

month for the waste management cost. This program can eliminate this cost and each family saves between Rp. 120,000 and Rp. 600,000 per year. Indirectly, the Sukunan village can save between Rp. 37,440,000 and Rp. 187,200,000 per year.

Besides, there are now opportunities to run community businesses, such as making handicrafts from rubbish, producing compost, collecting and selling rubbish, establishing rubbish recycling facilities and a business training centre. Many Sukunan people can be involved in the business. Seventeen Sukunan women make handicrafts from the various food and beverage packaging. They get the handicraft materials from Sukunan people and canteens in other area. The women make handicrafts in their home. The handicrafts then be sold to Sukunan visitors and tourists. 75% of the money gained from selling handicrafts will be given to handicraft makers, while 20% is used to buy material and 5% is given to the village as additional income. During a month, each active woman in the group can get between Rp. 300,000 and Rp. 500,000 as additional income.

Some Sukunan people also make compost using leaves and cattle manure. They can produce 100 packs of compost a month. The price of compost is Rp. 4,000 per pack. Similar with selling handicrafts, they get 75% of the money as income, 20% to buy more packs and 5% goes to the village. The Sukunan waste management program has a rubbish collector. He works to take the rubbish from bins to garbage depo. The collector works once a week and gets an addition income of Rp. 250,000 per month.

There are seven Sukunan youths working in the workshop. They have gained many skills in the waste management program. They can further develop their skills and talents. They produce some waste management facilities, such as bins, compost bins, painted clay pots, rubbish hangers and more. People can also ask them to make artistic bins, painted clay pots and murals. They can hence get addition income of Rp. 750,000 per month per active person.

The Sukunan waste management has improved the knowledge and skills of many people about waste management and recycling. Some of them are capable of working as educators and trainers in waste management and recycling. They can educate and train other communities, students, office staff and train more trainers. They usually get a financial incentive from it.

6.6 Economic Benefit for the Village

The waste management system can give additional income to Sukunan village. The profits of selling rubbish, handicrafts and compost are resources that creates a village income. The village get about Rp. 500,000 – Rp. 2000,000/month.

Beside that, the village also receives addition income from visitors, training, the youth workshop, donations, etc. During five years, Sukunan village have got at least Rp. 50,000,000 from all these resources. Some of the income has been used to buy chairs, tables and a sound system to support the community.

6.7 Benefits for Government

Sukunan has helped government to manage the garbage. The program can reduce the volume of garbage entering landfill disposal sites. Indirectly they also cut the cost of government in managing garbage. As a comparison, the waste management operating cost in Yogyakarta city is around Rp. 5 billion a year, while the government just received retribution of Rp. 1 billion from community rates.

6.8 Benefits for Private Companies

The Sukunan waste management system produces much recycle material, such as plastic, paper, metal and glass. The private company will get many benefits from it. For instance, recycling aluminum uses 95% less energy than producing aluminium from row material. Recycling old paper instead of using new timber to produce paper uses 60% less energy.

7.0 Conclusion

The Sukunan's waste management system could be conducted in Sukunan village because of good cooperation and understanding among the pioneers of the program, motivators, leaders and the community itself. The Sukunan's waste management system is a simple system that can be easily replicated anywhere.

This system has been proven to work very well and help a lot to save the environment, prevent illness, avoid social conflict, provide job opportunities, give economic benefits, and enhancing the sense of belonging to the community, to their own program and to the village. If many areas in Indonesia or even in the world do the same thing, it is certainly that living conditions will improve.

BALADA SEONGGOK SAMPAH

(Puisi; karya Iswanto & Ronadeva)

Aku lahir karena kamu,
Aku ada juga karena kamu,
Setiap hari engkau hasilkan aku,
Setiap hari pula engkau campakkan aku

Betapa malang nasibku jadi seonggok sampah;
Selalu dijauhi, dihina dan disia-siakan.
Betapa sedih ditakdirkan jadi setumpuk sampah
Dianggap biang bencana dan musibah

Salah sendiri engkau buang aku ke kali,
Hingga aku kirimkan banjir bertubi-tubi,
Salah sendiri engkau bakar aku sembarangan,
Hingga aku tebarkan racun pencemaran,

Salah sendiri engkau buang aku di tepi jalan,
Hingga aku munculkan kekumuhan,
Salah sendiri engkau buang aku di sembarang tempat,
Hingga aku sebarkan lalat dan bau menyengat

Tidak mampukah wahai engkau manusia?
Mengelola aku dengan sebaik-baiknya,
Tidak sadarkan wahai engkau manusia?
Ada mutiara dalam seonggok sampah.

BUDAYA BERSIH

(Lagu; karya Iswanto)

Marilah mari wahai kita semua
Kita jaga kebersihan lingkungan
Jangan lupa kita harus memilahkan
Sampah plastik kertas kaca dan logam

Kita harus jaga kesehatan
Buang sampah jangan sembarangan
Bakar sampah jangan dilakukan
Sampah-sampah ayo kita kumpulkan

Budaya bersih.... kita wujudkan
Agar lingkungan sehat dan nyaman

KELOLA SAMPAH

(Daur ulang lagu “Menanam Jagung”)
Syair : Iswanto

Ayo kawan kelola sampah
Dengan tiga R dan pilah-pilah
Kurangi sampah, manfaatkan sampah,
Ayo semua mendaur ulang sampah,

Pisah, pisah, pisahlah sampah
Jalan terbaik kelola sampah
Pisah, pisah, pisahlah sampah,
Jalan terbaik kelola sampah.