Social Green as a Strategy to Design Sustainable City in Developing Countries A case study of Surabaya

Citra Hennida

Universitas Airlangga, Indonesia

0428

The Asian Conference on Sustainability, Energy & the Environment 2013

Official Conference Proceedings 2013

Abstract

Designing city with minimum ecological foot print is necessary. However, most cities in developing countries have lack ability to design it. Lack of budget, lack of technology, urbanization, rapid population and economic competitive pressure has created slum and waste (Zarsky & Tay, 2000). Article argues that environment policy should meet five criteria. It should have cheap and easy technology implementation, local government regulations that resemble international environment commitment, budget sustainability, law enforcement and community involvement. Moreover, the initiative should be bottom up; decentralization and community based. Each city has unique problem and solution, so it should be not centralized. Local government has authority to design the program. Community based means that local government should encourage community to design the program. All program and design should be from community since the main problems are on budget sustainability and changing habit. Clapp and Dauvergne (2005) call it social green. In order to support the argument, article takes Surabaya as an example. Surabaya is a pilot project for solid waste management in Indonesia. Solid waste management in Surabaya is initiated by private companies and local communities. The program has not only succeeded reducing municipal waste, but also generates income for households as they turn waste into organic fertilizer. Furthermore, it creates city farming. People start to cultivate veggies and fruits and use their homemade fertilizer.

Keywords: sustainable city, social green, solid waste management, city farming, Surabaya

Introduction

Waste management is a problem in most cities in developing countries, so does in Surabaya. Surabaya is the second largest city in Indonesia. Its inhabitants are over three million and its produces 2,390 ton waste a day (Hartono, 2007). However, in 2007, Surabaya been selected as pilot project on reducing and composting organic waste in Indonesia (Tejo, 2007). Surabaya has succeeded implementing community based waste management. The project is adopted in Medan, Palembang, Jakarta, Bandung, Semarang, Jogjakarta, Jombang, Denpasar, Makasar, Balikpapan and Tarakan (IGES, 2009).

Despite the fact that Surabaya has reduced its organic waste, it does not mean that the government successfully overcome all problems. Every year there is waste related problem such as floods and dengue fever. It means that the management is not comprehensive. The development and implementation of environmental policy, program and practice is partial. Lack of budget, lack of technology, inefficient policy and economic competitive pressure are some problems relate to environment management (Zarsky & Tay, 2000).

Clapp and Dauvergne (2005) explained that there are four views on environment. First view is market liberal. Market liberal believes that economic growth and high per capita incomes are essential for the maintenance of sustainable development. It stresses on scientific achievements, human progress, and human ability to reverse and repair environmental problem. Second view is institutionalism. Institutionalism stresses the need of strong institutions and norms to protect the environment. The principle of sustainable development should be internalized into the decision making process of state bureaucracies, corporations and international organizations. Third view is bio environmentalism. Bio environmentalism emphasizes that mindset changing and law enforcement is good for environment protection. Fourth view is social green. It suggests community based program in order to overcome environmental problems. It also proposes that understanding global context with local perspective.

Using those views, article argues that environment policy should meet five criteria which are technology implementation, international environment commitment in which sustainability internalized through local government regulations, budget sustainability, law enforcement and community involvement. In order to support the argument, I analyse municipal solid waste (domestic waste) management in Surabaya.

Municipal solid waste problems in Surabaya

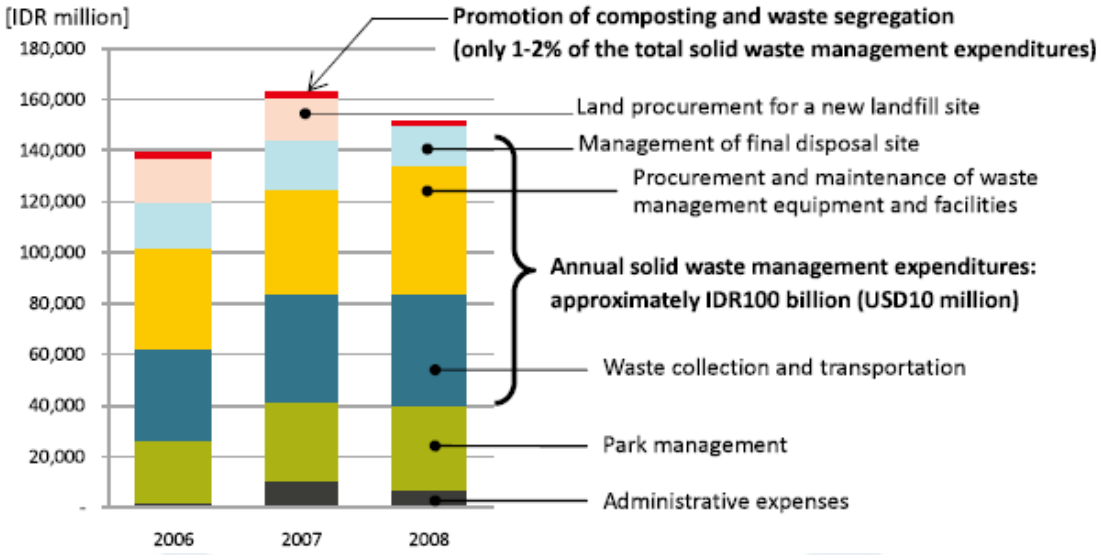
Based on 2005 data, Surabaya produces 2,390 ton waste per day in which 61.92% goes to final disposal site (TPA), 5.02% burns at temporary disposal sites (TPS), 22.26% manages independently and 10.70% disposes everywhere, for instance rivers, streets and backyards (Hartono, 2007).[1] There are six waste management problems in

[1] Surabaya is divided into 31 districts in which 163 sub districts on it. Each sub district consists of several neighbourhood units, which consists of 200 to 300 households. In Surabaya, domestic waste is transported on two stages. First stage is the transportation from producers to TPS. Producers are responsible for the transportation budget. It organizes at neighbourhood unit (RT) where each

Surabaya. Firstly, it has problem with waste production source. It is differentiated into four sources: residential, commercial, institutional and municipal services. Meanwhile, 55% of waste is organic and most of it comes from residential. In order to overcome the problem, municipal government implemented a home based composting system. The system has implemented since 2005. Based on the City Development Planning Department (BAPPEKO) data, organic waste was reduced from 1,500 ton a day in 2005 to 1,150 ton a day in 2008. The program also changes community habit in which 80% of domestic waste had been sorted and composted before it was dumped at TPS (Tejo, 2007).

Secondly, Surabaya has problem with budget allocation. In 2002, budget for the Department of Cleansing and Landscaping was only 6% from the total municipal budget (Silas, 2002). On the other hand, the department has responsible for the whole municipal waste management ensuring that the city is neat, clean and free from any impact incurred by waste (see Figure 1). As the result, there is gap between expense and revenue for daily operational. Moreover, Surabaya needs another TPA as it has one TPA with limited capacity (see Table 1). The government plans to built incinerator at TPA, but it costs a half of total municipal budget (APBD) (Mada, 2010).

Figure 1. Annual expenditure of the Department of Cleansing and Landscaping, Surabaya, 2006-2008[2]



Thirdly, it has problem with technology. Surabaya is not equipped by enough waste supporting appliances and technology. This condition is not only endangering the environment but also not sustainable. Most people treat waste with end of pipe approach in which waste are dumped, collected and then disposed. They also use open

household contributes some money for garbage collection. It costs about three until five thousand rupiah per month (US$ 0.50). Collected money is used to pay the salary of garbage collector. Second stage is the transportation from TPS to TPA. At this stage the municipal government is responsible for the budget and for the waste management.

[2] Maeda(a), p. 8.

garbage bins in their house. In addition, there are many residents' sites and commercial sites that not equipped with different bins. For the transportation, local government is using open dump trucks transporting from TPS to TPA. While transporting from houses to TPS is using open carts. Wastes are exposed to air and pollute the environment. Last is lack of technology at TPA. Surabaya is using semi sanitary landfill in which often not covered with soil. It is not only endangering public health but also creating pollution such as groundwater contamination and methane gas migration which cause fires. Here are details of waste supporting appliances that Surabaya has.

Table 1. Waste supporting appliances

Facilities	Unit	Capacity
Final disposal site	1	16 hectares
Temporary disposal site	159	
Trucks with different type	108	6 m^3 to 14 m^3
Bulldozer, excavator, loader	13	
Mini incinerator	10	
Communal composting centre	14*	
Takakura basket	19.200*	

*data in 2009

Fourthly, it has problem with city planning. Landfill is situated near to residential areas and the capacity is limited. Surabaya had two landfills, which were Keputih, situated in East Surabaya and Benowo, situated in West Surabaya. However, Keputih was closed in 2001 because of residents' resistance. Keputih caused fires, odours and groundwater pollution. Additionally, TPA Benowo is situated near fishponds, and soil deposit is limited. As sanitary landfill system needs soil for covering, soil is brought from outside Benowo which is far. As a result, landfill area is often not covered with soil. As Benowo site is far, the transporting frequency is also limited.

Fifthly, it has problem with political commitment. Mayor changing has its contribution to the waste management policy in Surabaya (Silas, 2002). Municipal solid waste management is less important than other issues among the majority of policy makers. Lack of political commitment impacted on regulations making and enforcement. Environmental legislations at national and municipal level are not sufficient. There is no national policy for waste management, not until 2007. There is a waste management act no 18/2008 that precisely regulate waste management system. The act contains several points. First, there is public participation and involvement. Second, there is exact differentiation on the role description at government level. Third, there is scheme for compensation and sanction. Fourth, there is regulation on cooperation between local governments, and local governments and private sector (Sidik, 2008). The new legislation acquires several consequences to local government to formulate local regulations, provide accurate baseline data, build environmental friendly landfill, set target on waste reduction, expand cleaning area, choose proper waste technology and open public and private participation (Sidik, 2008). However, as decentralization in 2001, local government and municipal government have a limited budget for the implementation. Poor waste appliances and facilities are some result for the poor political commitment.

Sixthly, it has problem with community involvement. Even though participation at residents' site is high, participation at the commercial and public sites is low. Demographic composition of Surabaya residents is also an obstacle. Home based composting system is targeting housewives. As many women are career women, the practice depends to household assistants who are migrants. They are not permanent residents and their movement to other cities or areas is high.

Establishing an effective municipal solid waste management in Surabaya

Establishing an effective municipal solid waste management in Surabaya is not easy. In order to establish an effective municipal solid waste management in Surabaya, policy should meet five criteria which are technology implementation, international environment commitment in which sustainability internalized through local government regulations, law enforcement, budget sustainability and community involvement.

Firstly, as waste is unavoidable, implementing precise technology is needed. Regarding the technology, municipal government focuses on source reduction. Source reduction is important as TPA capacity is limited and municipal government has minimum budget to expand or create a new TPA. Reduction on sources could minimize the budget for establishing a new TPA and budget for the management itself. For instance, municipal government, in 2008, spent US$ 10 million a year for solid waste management alone (see Figure 2).

After the research on 2002, it was identified that organic waste is the main source (see Figure 1). Households as a source is also the majority [3] Therefore, Surabaya is targeting on households and organic waste reduction under the program community based waste management which was initiated in 2004. Technology that supporting the program is *Takakura*, a home based composting technology. *Takakura* basket is part of Surabaya Kitakyushu partnership on waste management. With this program, Surabaya has reduced its waste 18.6% (1,480 tons in 2007) from 2,610 tons in 2001.[4]

However, TPA technology should be developed so does other waste appliances like dump truck. Sanitary landfill is also not sufficient due to pollution. TPA should be sustainable. Singapore practice is an example. Table 3 describes disposal method that can be chosen.

[3] Hartono, et.al

[4] UN Habitat, *Best practices database in improving the living environment*, 2008, viewed 10 may 2013, < http://www.unhabitat.org/bestpractices/2008/mainview.asp?BPID=1903>

Table 3. Disposal Methods for Municipal Solid Waste in Selected ASEAN Countries

Country	Disposal Methods (%)				
	Composting	Open dumping	Landfilling	Incineration	Others
Indonesia	15	60	10	2	13
Malaysia	10		30	5	5
Myanmar	5	80	10	-	5
Philippines	10	75	10	-	5
Singapore	-	-	30 *(10 in 2002)	70 *(90 in 2002)	-
Thailand	10 **(0 in 2001)	65 **(67 in 2001)	5 **(32 in 2001)	5 **(1 in 2001)	15 **(0 in 2001)
Vietnam	10	70	-	-	20

Source: ENV 1997

*Communication with National Environment Agency officials
**Draft Annual Report, the State of Pollution, Thailand B. E.2544 (2001), Pollution Control Department 2002

Secondly, waste management policy should be sustainable. It means that it gives environmental, social and economic benefits to city and its inhabitants.[5] Sustainability is an ambiguous definition.[6] However, sustainability stresses that it can be achieved through local initiatives with global significance.[7] Sustainability, however, should be internalized into local regulations. UNEP recommends that national government should develop legislation and policies that promotes environment protection and establish agency or department for the implementation and research. Those should be integrated with international commitment that has been adopted like Agenda 21.[8] At

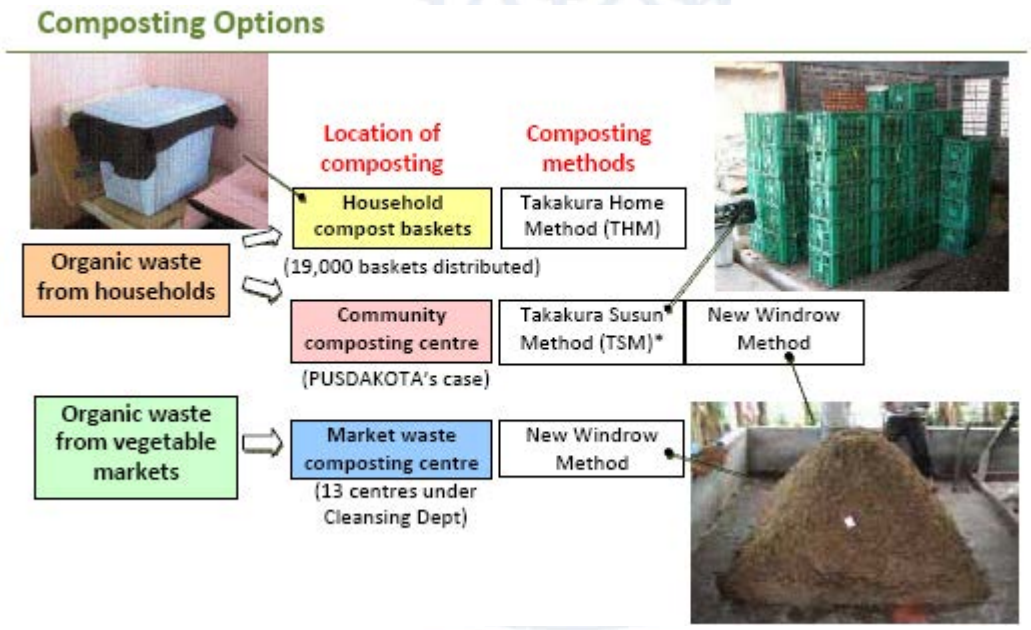
[5] There are three pillars of sustainability: economic, social and environment.
[6] J. Dryzek, *The politics of the earth: environmental discourses*, Oxford University Press, Oxford, 1997, p. 124.
[7] P. Newman and J. Kenworthy, 'Sustainability and cities: summary and conclusions', in A.R. Cuthbert (ed), *Designing cities: critical readings in urban design,* Blackwell Publishing, Oxford, 2003 p. 235; Dryzek, p. 129.
[8] There are three principles of waste development within the context of sustainability based on Agenda 21. First, accumulation of waste should not disturb material and nutrient cycles. Second, waste disposal should be limited to a level not exceeding the environmental carrying capacity to absorb pollution. Third, recycling and compositing system should be developed. Thus, this agenda indentified into four programs: waste minimization; maximizing the concept of waste reuse, recycling and composting; extending waste service coverage; and promoting environmentally sound waste

regional level, beside the other two at national level, province government regulate solid waste management practice and encourage research and development of pilot project in their region. At municipal level, municipal government is responsible for the implementation of municipal solid waste management programs and facilities.[9]

In this part, neither local nor municipal government has solid waste legislation. At the national level, there is UU 18/2008 which explicitly stated that solid waste management in Indonesia projected to fulfil sustainability.[10] The new legislation also changes the paradigm from end of pipe practice to 3Rs (reduce, reuse and recycle) practice.[11]

Surabaya is a step ahead. Nevertheless, implementing 3R is difficult as it relates to changing habit. Surabaya implemented 'reduce' practice first before 'reuse' and 'recycle' practice. Reducing through composting system has been initiated since 2004. As composting is part of Indonesia culture, the implementation is much easier. People used to have *jumblangan,* a hole that dig in their backyard, to put their organic waste. *Jumblangan* was traditional composting method. Due to limited land, especially in big cities, *jumblangan* is no longer used. *Takakura* offer the same result, and as it is a basket, this method is more compact and suitable for land limited house. Composting is applied at households and vegetable markets such as Keputran (see Figure 3).

Figure 3. Type of composting options in Surabaya



disposal and treatment. See <http://www.un.org/esa/agenda21/natlinfo/country/indonesia/natur.htm#waste>

[9] UNEP, *Integrated waste management scoreboard: a tool to measure performance in municipal solid waste* management, United Nations Environment Programme, 2005, pp. 9-10, viewed 11 May 2013, <http://www.unep.or.jp/Ietc/Publications/spc/IWM_scoreboard-binder.pdf>

[10] Article 3 and 6.

[11] Sidik.

Thirdly, law enforcement is needed in order to establish an effective solid waste management. There are regulations with certain fine for littering; however, there is no one fined for it.

Fourthly, solid waste management needs budget sustainability. It relates to political commitment. However, as waste not strategic issue compare to employment and education, budget allocation is tend to minimum. Moreover, during the crisis, government revenues have been allocated for other programs. For that, municipal government can do several infiltrates. First, municipal government could maximize local sources such as private companies, community and NGOs.[12] Municipal government open a wide access to community and private business. It can use CSR legislation (UU no 40/2007) in order to access private business involvement. Table 4 describes an example of business and community financial involvement. Table 3 shows that Unilever, private business, alone contributes 48% in 2005 for community based waste management program. It means that private businesses are potential asset. Moreover, Surabaya is known as city of *Budipamarinda* which stands for industries, commerce, maritime, education, garrison and tourism. Rungkut, Ngagel, Tanjung Perak and Tandes are industrial sites in Surabaya.[13] Commerce is vast developed also. There are 24 malls in Surabaya.[14] Each of which is a potential assets. Under the new environment legislation UU 18/2008, local government can make local legislation which rules that. Incentives and compensation such as green tax can be adopted. Moreover, private business and NGOs are potential for designing, monitoring and implementing environment programs and industrial regulations. Municipal government monitor their practice and develop community monitoring capacities.[15] For instance is whether or not industrial and commercial sites obey waste disposal regulations. Second, municipal government could access foreign sources. Municipal government takes benefits from regionalism in Asia. Regionalism means that either capital or technology can be accessed easily.[16] For instance, Japan which prioritizes on environment policy could be resource for waste technology and environment aid. Municipal government could also maximize sister city cooperation for adopting waste management. Moreover, Surabaya`s composting practice is adopted in other cities in Indonesia and abroad. [17] Inter city relations should be easier and fruitful.

[12] Zarsky and Tay, p. 139

[13] H. D. Ferita, 'City report of Surabaya', paper presented at AUICK First 2006 Workshop, p. 2, viewed 15 May 2013,<http://www.auick.org/database/training/2006-1/CR/WS2006-1CR-Surabaya.pdf>.

[14] D. A. Setiono, 'Penambahan mall masih mungkin, asal ada zoningisasi', *Berita Jatim*, 6 April 2010, viewed 10 May 2013, < http://www.beritajatim.com/detailnews.php/1/Ekonomi/2010-04-06/60742/Penambahan_Mal_Masih_Mungkin,_Asal_Ada_Zoningisasi>

[15] Zarsky and Tay, pp. 139-140.

[16] G. R. Heaton and B. Resosudarmo, 'Technology and environmental performance: leveraging growth and sustainability' in D.P. Angel and M. T. Rock (eds), *Asia`s clean revolution: industry, growth and the environment*, Greenleaf Publishing Limited, Sheffield, 2000, p.54.

[17] It has been adopted in Medan, Palembang, Jakarta, Semarang, Makassar, Balikpapan, Tarakan, Kuala Lumpur (Malaysia), Bangkok (Thailand), Cebu and Iloilo (Philippines). See IGES.

Table 4. Financial profile regarding community based waste management

YEAR	TOTAL BUDGET in USD	Surabaya City Government	Partner 1 (% of total budget) – Unilever	Partner 2 Local NGO	Partner 3 (% of total budget) – Kitakyushu City Government	Partner 4 - Media
2005	12.000 USD	42 %	48 %	Technical and administrative support (they help city government to increase people awareness (campaigns), make compost and also recycle waste.	10 %	In kind (gift for green and clean road shows), publishing information to their news paper (about green and clean and Free from Waste Movement), make banners for elucidations
2006	9,000 USD	66 %	34 %			
2007	43,000 USD	91 %	9 %			
2008	25,000 USD	100%	N/A		N/A	

Note: Other partners namely local NGOs and Media do not give direct financial contribution. As example the Media (Jawa Post, Jaktim TV and Radar) provide in-kind support such as coverage and publication of events in the media and sponsorship of awards.

Fifthly, solid waste management needs community involvement. Community involvement is needed because most of municipal wastes are from domestic waste. Domestic wastes are produced in the community, at the household level. Moreover, like have been stated in this article, main problems are on budget and habitual change. Habitual change is not top down policy, it should be bottom up because the character of the waste itself. Furthermore, Zarsky and Tay (2000) emphasize that community involvement and partnership benefit municipal government in three areas.[18] First, it minimizes government budget as it bases on voluntarism and low paid community labour. Second, it helps the establishment of good governance as civic engagement is important component of good governance. Last, it minimizes public spending.

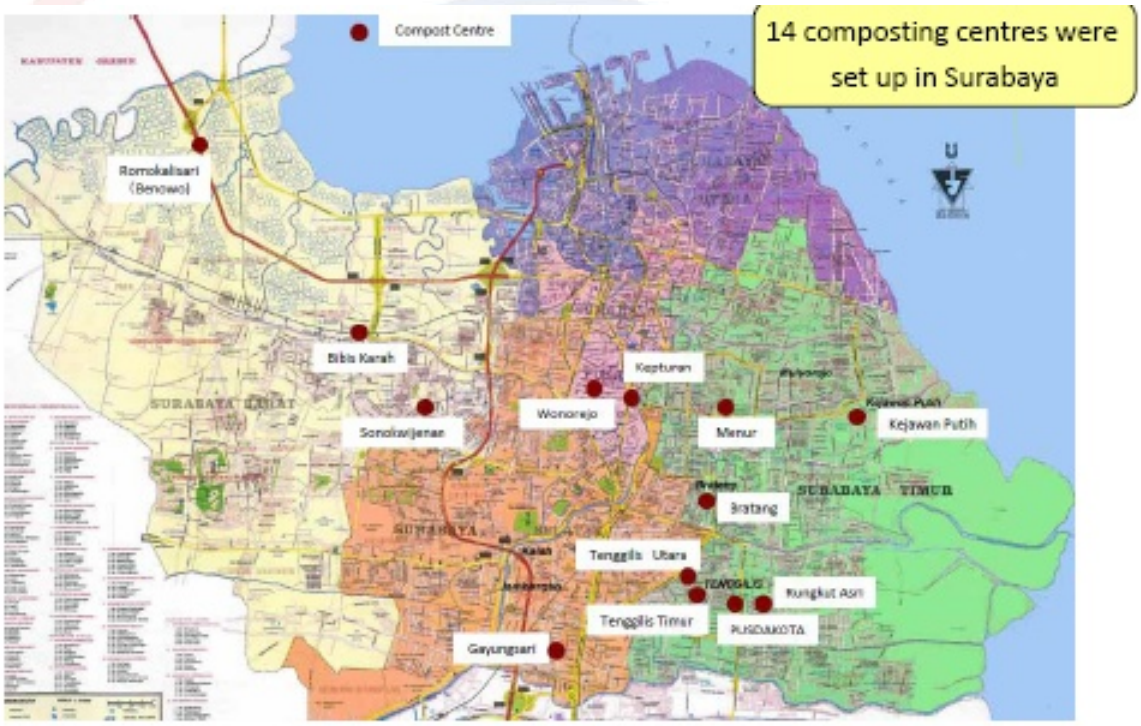
Waste management in Surabaya is based on community development. Surabaya has environmental cadre in every ten houses. Environmental cadre is also member of city women organization (PKK Kota), an organization headed by wife of city mayor. PKK Kota has strong community network. Most of kampong`s administrator are PKK

[18] Zarsky and Tray, p. 149.

member. For that reason, campaign of community based waste management is not so hard. Environmental cadre teaches people in their society how to sort and compost their organic waste. Furthermore, society with the support of environmental cadres and local NGO can produce goods from plastic waste like bags and sandals.

There is also TPS which functioned as waste composting study centre. Community waste station is conducted by local NGOs. In this station, people are not only learning how to sort and compost their waste but also learning how to get economic benefit from their waste. In Surabaya, composts from society are used to fertilize their plants or sell to the government. Integrated with this program, Surabaya government through Cleansing and Landscaping Department develop eleven city parks which composts come from community and vegetable markets. Composting centre, moreover, can be an answer for the need of another TPA.

Figure 4. Composting centres in Surabaya



The next question is how to engage people on this community model? Engaging and tighten commitment are not easy. People are easily to forget and ignore due to their routine. For that reason, there are five strategies that can be adopted. Surabaya people are dominated by middle class who spend their time mostly at the office. Most of households have domestic assistant or servant. They have lack education and come from surrounding regions near Surabaya. Understanding the character, applying cheap and easy technology is needed. Surabaya has started using *Takakura* in 2003, and now it has adopted nationally. In 2012, the ministry of environment distributed composting basket nationally. In some regions, the availability of composting basket does not linear with changing habit. The local government has difficulties to distribute it because community did not want it. Therefore, it needs another strategy. It should give economic benefit. The next question is after they sorting and composting their waste, so what next to do? Is there any economic benefit? The government should think about it. The next strategy is local government should encourage people to take

part for design and implementation of the policy. But first, the policy should be popular. For that reason, media coverage and fun competition are needed.

How about Surabaya? Surabaya implemented those strategies. Since 2003, the local government committed to environment. Composting basket has been introduced from 2003, long before the ministry of environment introduces the same policy. The environment project is also supported by the media. There is annual environment competition, called "Surabaya Green and Clean". This program starts in 2005 and followed by 325 neighbourhood unit (RT/Kampong). In 2008, the program was followed by 1,797 RT.[19] Surabaya has also program called "Free from Waste". Different from "Green and Clean" which conducted on May (May is Surabaya Anniversary), "Free from Waste" is conducted on August, as part of celebrating independence. Both of them become annual program are widely covered in newspapers, radios and television. It changes kampongs in Surabaya more green and clean. Kampong which won the competition not only looks green but also has vision to sustain their environment. For instance, in kampong *Jambangan*, people plant medicine herbs and pollution absorber plant. For the fertilizer, they use their home making compost from *Takakura*. *Jambangan* is highly appreciated and won the competition in three years. *Jambangan* is also a pilot project for composting system and waste craft production. Moreover, Surabaya received some international acknowledgement such as Energy Globe Award in Austria 2005, Green Apple and Green Organization in London 2007 and UNESCAP Award 2007 for Urban Environment Improvement.[20]

Environment competition is cheap. "Green and Clean" expenses US$150,000-200,000 annually, compare to US$10m for other ordinary solid waste management task. In addition, community has their own budget to run their composting system from selling fertilizer, recycling waste, and creating handicraft. In other word, social green strategy overcome problem with lack of budget. Social green strategy is also changing habit into the "greener" one. More and more neighborhood join environment competition. As the result, the growth of population and the growth of waste isn't linear. Based on data from Surabaya government, waste production in 2005 is 1,819 m^3 with total population of 2.74 million. Meanwhile, in 2011, waste production is only 1,150 m^3 whereas the number of population increases to 3.02 million. See Table 5 for details.

Table 5. The growth of population and waste in Surabaya 2005-2011

	2005	2006	2007	2008	2009	2010	2011
Waste production (m^3)	1,819	1,641	1,480	1,259	1,229	1,242	1,150
Population (million)	2.74	2.78	2.82	2.90	2.93	2.92	3.02

[19] Maeda(a), p.4.
[20] UN Habitat

Conclusion

Solid waste management in Surabaya is based on community involvement. This practice is widely adopted throughout Indonesia. Solid waste management in Surabaya focuses on source reduction at household level. The implementation of low cost technology, community involvement and municipal government support are three dominant factors that make it success.

Those are not enough; in order to make an effective solid waste management, environment policy should meet five criteria which are technology implementation, international environment commitment in which sustainability internalized through local government regulations, budget sustainability, law enforcement and community involvement. Surabaya has lack of technology especially at TPA and waste management facilities. Moreover, limited budget, lack of regulations and law enforcement are other obstacles. Furthermore, neither facilities nor standard mechanism regarding other sources such as commercial and public sites is available. Last, high dependency on community at one side is good that people are responsible on their waste, but it needs regulations in order to sustain their commitment.

References:

Clapp, J. and Dauvergne, P., *Paths to a green world: the political economy of the global environment*, The MIT Press, Cambridge, 2005.

Dryzek, J., *The politics of the earth: environmental discourses*, Oxford University Press, Oxford, 1997.

Ferita, H. D., 'City report of Surabaya', paper presented at AUICK First 2006 Workshop, p. 2, viewed 15 May 2013,<http://www.auick.org/database/training/2006-1/CR/WS2006-1CR-Surabaya.pdf>.

Hartono, B. D. et al., *Community based development towards a sustainable* city, presented at 4th Kitakyushu Initiative Network Meeting, 25 June, 2007, viewed 29 April 2013,
<http://kitakyushu.iges.or.jp/docs/network_meetings/kin4/ppt/23.Hartono.pdf>

Heaton, G. R. and Resosudarmo, B., 'Technology and environmental performance: leveraging growth and sustainability' in D.P. Angel and M. T. Rock (eds), *Asia`s clean revolution: industry, growth and the environment*, Greenleaf Publishing Limited, Sheffield, 2000

IGES, *Workshop-trainning on composting: social and economic benefits*, 2009, viewed, 9 May 2013, <http://www.smc.gov.my/thm02.pdf>

Mada, K. R., 'Surabaya belum terlambat mencegah sampah', *Kompas,* 3 May 2010, viewed 10 May 2013, < http://cetak.kompas.com/read/xml/2010/05/03/16422015 /surabaya.belum.terlambat.mencegah.sampah>

Maeda (a), T., 'Reducing waste through the promotion of composting and active involvement of various stakeholders: replicating Surabaya`a solid waste management model', *IGES/Kitakyushu Initiative Policy Brief*, viewed 9 May 2013, <http://www.un.org/esa/dsd/susdevtopics/sdt_pdfs/meetings2010/icm0310/1e_Toshizo_Maeda.pdf>

Maeda (b), T., 'Enhancing public awareness and stakeholder's empowerment and involvement in waste management-through a case in Surabaya, Indonesia', presented at International Consultative Meeting on Expanding waste Management Services in Developing Countries, Kitakyushu, 18 March 2010, viewed 9 May 2013, <http://www.un.org/esa/dsd/susdevtopics/sdt_pdfs/meetings2010/icm0310/1e_Toshizo_Maeda.pdf

Newman, P. and Kenworthy, J., 'Sustainability and cities: summary and conclusions', in A.R. Cuthbert (ed), *Designing cities: critical readings in urban design,* Blackwell Publishing, Oxford, 2003

Setiono, D. A., 'Penambahan mall masih mungkin, asal ada zoningisasi', *Berita Jatim*, 6 April 2010, viewed 10 May 2013,

<http://www.beritajatim.com/detailnews.php/1/Ekonomi/2010-0406/60742/Penambahan_Mal_Masih_Mungkin,_Asal_Ada_Zoningisasi>

Sidik, U. S., *Indonesia solid waste policy and management: based on law no. 18 year 2008 regarding waste management.* viewed 29 April 2013,

<http://kitakyushu.iges.or.jp/activities/workshops_seminars/Surabaya/Session%202/MOE.pdf>

Silas, J., *Waste management problems in Surabaya: an integrated sustainable approach,* paper presented at Solid Waste Management Seminar in Kitakyushu, 20 September 2002, viewed 29 April 2013, <http://kitakyushu.iges.or.jp/docs/sp/swm/3%20Waste%20management%20problems%20in%20Surabaya.pdf>

Solid Waste Management Seminar, 19 – 20 September 2002, viewed 29 April 2013, <http://kitakyushu.iges.or.jp/docs/sp/swm/3%20Surabaya%20(Paper).pdf>

Tejo, A., *Surabaya jadi pilot project pengelolaan* sampah, 23 November 2007, viewed 29 April 2013,
<http://news.okezone.com/index.php/ReadStory/2007/11/23/1/63218>

UNEP, *Integrated waste management scoreboard: a tool to measure performance in municipal solid waste* management, United Nations Environment Programme, 2005, viewed 11 May 2013,

<http://www.unep.or.jp/Ietc/Publications/spc/IWM_scoreboard-binder.pdf>

UN Habitat, *Best practices database in improving the living environment*, 2008, viewed 10 may 2013,

< http://www.unhabitat.org/bestpractices/2008/mainview.asp?BPID=1903>

Zarsky, L. and Tay, S., 'Civil society and the future of environmental governance in Asia' in D.P. Angel and M. T. Rock (eds), *Asia`s clean revolution: industry, growth and the environment*, Greenleaf Publishing Limited, Sheffield, 2000.

iafor