Journal of Innovation in Business and Economics http://ejournal.umm.ac.id/index.php/jibe
Vol. 02 No. 01 June 2018 Page 37-46
P-ISSN: 2580-9431 E-ISSN: 2581-2025

Received: 08-09-2018. Accepted: 27-11-2018. Published: 26-12-2018

Optimization of Waste Management Through Women's Empowerment

Nazaruddin Malik[1], Sri Budi Cantika Yuli[2], Muhammad Sri Wahyudi Suliswanto[3]

Faculty of Economics and Business, Universitas Muhammadiyah Malang[123]

Abstract

The purpose of the research is providing an analysis on the economic opportunities that can be generated through the implementation of an integrated and well organized solid waste management in order to increase the economic value of garbage from the level of household, small, and medium industry to give positive impact due to the increased prosperity for the community in urban areas, especially the poor. The research employed survey method to identify the fundamental problems at the level of households and industries, in-depth interviews, focus group discussions to find strategic steps and practices in implementing integrated waste management which based on partnerships to overcome urban poverty. The results of this study indicated that the economic value of organic waste is Rp. 193, 952, 422 ($14,841.80) per year and Rp. 223, 142, 710 ($17,077.86) per year for inorganic waste. This potential should be properly managed through synergizing the existing waste management agencies such as the Department of Public Cleanliness and the Waste Bank of Malang city. The synergy on waste management should be made up to the lowest level in public institutions that is housewives association, because the role of housewife is very important in the success of waste management. Thus, the funds collected from the optimization of waste management can be used as business capital to help low income working families in Malang city.

Keywords: Women's empowerment; waste management; city of malang

Introduction

Waste management is efficiently and effectively becoming one of the important challenges for government especially in many developing countries around the world (Pasang et al., 2007; Sharholy et al., 2008; Manaf et al., 2009; Singhirunnusorn et al., 2012). The increasing of urbanization and economic growth results a raising infrastructure needed to support human activities in it. Research in 1999 showed, cities in Asia produced more than 2.7 million m3 of waste per day and predicted increase in 2025 by almost 2 times (Pargal. *et.al*, 1999). The data from Ministry of Environment in 2003 stated that in 1995 the average waste per person in urban areas was about 0.8 kg per day and in 2000 it increased to 1 kg per person per day. It can be predicted that by 2020 the waste per person per day is 2.1 kg (Malik, 2008).

Waste provides valuable economic potential, both organic waste that can be composted and inorganic waste that can be recycled. A careful analysis is needed in order to understand the potential of garbage since it will create its own market eventually. Kotler in Dewi (2009) stated that the market potential is the limit that is approached by market demand as industrial marketing expenditure approaches infinity value for a predetermined environment. Meanwhile, Supranto in Dewi (2009) suggested that market potential is a capacity estimation of the market to accommodate production goods. The variables observed were: a) Total production in the amount offered or requested by consumer; b) The price is the value that should be spent by consumers or buyers to get the products.

Boeni et al. (2008) described Latin American model for the integration of small-scale garbage collection with a formal garbage collection system as an example of this practice of collecting/transporting waste were quite good. These systems were developed in the Andean countries and increasingly imitated by several countries in Central America.

These companies are paid by the municipality or by community organizations to provide services by using human power carts and semi motors. They served the hills and suburbs which were not served directly by the trucks.

Due to the low costs of the equipment needed, it costs about 2/3 of a method using a vehicle. Low administrative costs, particularly for the members of the company to be part of the administration and operations. In addition, operations and maintenance of the equipment were very simple and cheap, and

[1] nazaruddin@umm.ac.id

[2] cantikayuli@gmail.com

[3] al.ayudie@gmail.com

could be operated by the members of company.

The thing made this model became very good was because the wide scope will be gotten if it was seen from the benefits that can be produced. Many advantages would be gotten by the communities from the waste disposal services. City government also got benefit as it could save up to 65% from the normal costs and meet the demands for maintaining general cleanliness of local individuals and also benefit through the creation of jobs for themselves.

Henry et al. (2006) described in Kenya, some local governments such as Nairobi, Eldoret, and Mombasa has done solid waste management services through training and recruiting qualified staffs. In order to improve management of transportation and waste disposal, the local government has already approved the involvement of private sector through the privatization some services. Transportation and disposal solid waste services have been successfully done in the central business districts and an upscale residential area in Nairobi. Moreover, in Nairobi, institutions such as the Kenya Refuse Handlers Limited (KRHL), Domestic Refuse Disposal Services Limited (DRDSL), and Bins (Kenya) Limited have been authorized to fix the CDB and several other residential areas; and the result was efficiency improvement.

Besides, in Argentina, the management of solid waste involved all social components as one of the National SWM, so that it would be integrated and worked together from collecting until separating the solid waste. Waste problem needs to get serious attention from various sides, not only the city government, especially for a large number of landfill waste and pollution would be caused by piles of garbage cannot be taken by garbage worker. Currently, the city government still plays an important role in the regulation and practice of handling of urban waste. However, the city government has difficulties in funding and facilitating urban waste management services like the problem happened in Malang.

Moreover, many households and society neglect their responsibilities to take care of their waste and do not pay attention to waste management especially maintaining the waste from the sorting process until disposal method. Handling the waste problem will not be easy without the support of other stakeholders such as community or household, scavengers, waste collectors, and waste recycling company. Scavengers usually mess up and take the trash that has economical value, collectors and recycling companies only sorting and receiving. Consequently, the rubbish that has no economic value is scattered around the location of temporary and final disposal.

Actually, garbage has prospective potential energy that can be a source of renewable energy. If it is managed in a proper and good way, it will have high economic value or can produce something useful and income generating (Outerbridge (ed), 1991). However, if it is not handled properly, it will create dangerous problems for health and social environment, for examples the problems of water, land, and air pollution that appear locally, and the release of poisonous gases that cause the greenhouse effect and resulted in global pollution.

Thus, to maximize the potential, it needs support from household and general public about the importance and awareness of waste management from the classification until disposal method. Solving the waste problem will certainly not be able to run properly without the support of other stakeholders such as community or household, woman or housewife who has a big role in it.

Based on the above description, the purpose of this study is to identify the profile of women in waste management in Malang and build a model of the women empowerment through a policy of partnership in the implementation of solid waste management and action programs of solid waste management at the level of households and industries.

Literature Review

Miraftab (2004) on the research about waste collection services in Cape Town, South Africa explains the gender-discriminatory logic that the Cape Town government used to justify exploiting women as municipal waste pickers in poor neighbourhoods. It is important to bear in mind naturalizations of links between women and waste, waste work, and cleanliness, which lead to exploitation and under-valuation.

Madsen (2006) on the article about feminizing waste. This article argues that an exploration of strategies to improve the livelihoods of waste-pickers that takes advantage of their expertise and experience in recycling and environmental sustainability is lacking. Rather than building on the waste management models used in industrialized nations, this note proposes that developing countries encourage the existing systems of waste management practiced by wastepickers by improving the employment conditions and opportunities in this informal sector. This paper argues that economic and entrepreneurial programmes, specifically programmes in microfinance and the creation of "Recycling Schools," be employed to capitalize on waste-pickers' overlooked skills in waste management. Because the majority of wastepickers are women and children, an examination of gender roles and the vulnerability of children are also presented.

Noel (2010) on the research about solid waste workers and livelihood strategies in Greater Port-

au-Prince. This paper examines the involvement of workers in the solid waste management industry in Greater Port-au-Prince and the implications for livelihood strategies. The findings revealed that the Greater Port-au-Prince solid waste management system is very inclusive with respect to age, while highly segregated with regard to gender. This paper calls for better salary scales and work compensation for the solid waste pickers. The article concludes that women receive lower salaries, have more injuries on the job site, and have a greater desire to leave than men in similar positions. It does not address cooperatives, and does not provide tools for action.

Dias and Ogando (2015) on the research about gender and waste in Brazil. The research delves into the exploratory research-action project carried out in Minas Gerais, Brazil, with women waste pickers. The paper presents findings on the gender inequalities that structure women waste pickers' lives and how they confront them. The paper also contributes to methodological and theoretical discussions on the limits and possibilities for building gender awareness with women waste pickers. The overall objective is to show how such projects need to focus on strengthening women's individual and collective levels of empowerment.

Methodology

This study took place in Malang city. This area was selected because in East Java, Malang is the second major city after Surabaya which has the second largest population after Surabaya and also rapidly growth so that various things can be found here especially waste produced.

The method applied is survey to identify the fundamental problems at the level of households and industries, in-depth interviews, focus group discussions to find strategic steps and practices in implementing integrated waste management which based on partnerships to overcome urban poverty problems. The next step is to measure and analyze the potential and economic benefits of waste management that can be used as the basis for the strategy of increasing household income. Moreover, the next stage was the model of women empowerment through a policy of partnership in the implementation of solid waste management and action programs of integrated solid waste management in households and industries level.

The analysis tool used is as follows: First, Analysis of the volume of landfill waste is essential in planning and waste management. To predict the volume of landfill waste produced by society can be attributed to the number of city dwellers. Djuwendah (2005) states the volume of waste generated an average per capita per day in a city used the following approach:

$Vs = V \times P$

Information:

Vs = Total volume of waste collected at the landfill (m^3 / day)

V = Volume of waste generated per person (m^3 / person / day)

P = Total population.

This approach using secondary data based on the data recorded for some time. Djuwendah (2005) as for projecting daily waste volume for the foreseeable future be used the following approach:

$Qn = Pn \times V$

Information:

Qn = waste generated in the predicted per day

Pn = the number of residents in the predicted

V = the volume of waste generated on average per person per day

With the projection of the amount of garbage the total population will follow the development of the amount of litter. Djuwendah (2005) method of prediction of the total population of the future can be done by the following formula.

$Pn = Po\ (1 + r)^n$

Information:

Pn = Total population Year - n

Po = Total population last year of data

r = Average - Average annual population growth (%)

n = timeframe of projections

Second, Potential Economic Value of Solid Waste Processing Enterprises. According Oswari in Dewi (2009), the potential economic value can be determined by finding the average composition of

garbage, which separates the wet waste (organic), which consists of junk food / vegetable, wood, leaves, and meat / leather; and dry waste (inorganic) consisting of glass, plastic, cloth, paper, and metals. Then the waste in percentage (%) after it is multiplied by the prevailing selling prices.

Result and Discussion

The analysis of the volume of landfill waste is done by multiplying the number of people with an average production of waste per capita per day in Malang. The analysis showed that the pile of waste generated in 2014 was 0.050715 m3 / people / day, with a comparison of previous studies which in 2009 was 0.0052393 m3 / people / day, which means that an average growth of landfill waste over 5 years is equal to 8.68 or 0.009 m3 / people / day.

The total amount of potential of organic waste in Malang is 323,254.04 kg in one (1) year. The largest garbage bins are vegetables, leaf litter or shaft. The potential economic value of organic waste, with an estimated price obtained if it has been processed into compost, is Rp. 193, 952, 422 ($14,841.80) per year (assuming a price of Rp. 600 / kg).

Inorganic waste potential in Malang totaled 177,624.37 kg per year. The largest inorganic waste comes from plastic, then followed by stereo-foam, aluminum soft drink containers, and discarded cake packaging. The smallest total amount of the trash is metal. The alternative way to reduce the amount of garbage, especially inorganic waste, is through recycle pattern. The potential economic value of inorganic waste with an estimated price obtained from the stalls is Rp. 223, 142, 710 ($17,077.86) per year.

Malang has already possessed a trash management system through the Waste Bank. It is a cooperative established by groups that concerned about the environment and environmental health, especially in waste management, but had no legal institutions that accommodate their aspirations, so they could not perform an effective waste management, previously. Successful management of waste through waste bank required cooperation by all parties (Ahmed et al., 2004; Ahmed et al., 2006; Malik, 2008)

Waste Bank of Malang city (BSM) has the motto "borrow money, credit trash; buy groceries, pay garbage". The practice is, BSM will see the potential of waste from BSM unit for 3 months to determine the amount of how much the loan will be issued by the BSM. The ratio is 80% to pay the installments and 20% for savings. For the groceries, the customer will be able to exchange their garbage in the form of groceries by the garbage value in their savings.

Based on data in 2014, the Waste Bank of Malang has 303 Unit of Public BSM (90% active), 174 Unit of School BSM (60% active), 24 institutions (Active), 542 Individuals (Active), 14 units of Stalls/ collectors, with total number + 22,500 of Customers.

In addition, the amount of waste that fetched by BSM is + 2.5 tons per day from the customers and 0.5 tons collected from Stalls/ collectors. So, the total amount is + 3 tons per day with the total transactions + Rp. 4-5 million.

Currently, the sales revenue either from chopped/ minced or not chopped waste is ± Rp. 150 million ($11,479.52) with gross profits of Rp. 30 to 35 million ($2,296.07 to $2678.67) per month, with operational costs and BSM salaries approximately 30 million per month. The mechanism of waste management in the Waste Bank of Malang can be seen in Figure 1.

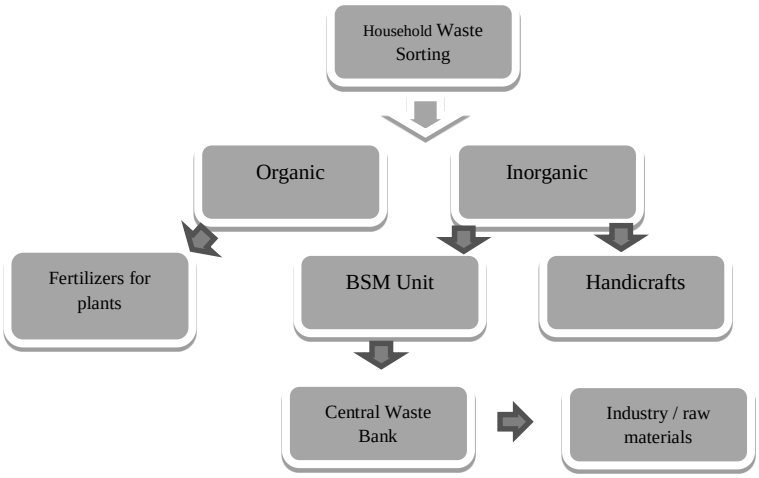

Figure 1. The Waste Bank Schematic

Source:banksampah.org

Description :

a. Sorting of household waste is an individual effort to sort out the trash so that later the prevailing price is in accordance with the type and amount of waste collected.
b. Organic garbage, the garbage collected from household waste such as leaves, rice, fruits, vegetables and others. It can be used for composting plants in the yard.
c. Inorganic garbage, a dry waste from households in the form of paper, cardboard, bottles, glass, and others. It can be utilized into handicrafts and others which can be saved at the Waste Bank unit.
d. Waste Bank unit, it is located in each RT / RW in a community environment. So that customers who are members of the unit are the residents of their own RT / RW. Garbage collected will be transported by car from Central Waste Bank at the appointed time. The price for each Kg of garbage collected by the customer, will be different with the price of Waste Bank Unit, the price difference becomes profit for the unit as the appreciation because its citizens are willing to accommodate their own waste.
e. Central Waste Bank, is the home of waste bank that functioned as the dropping point of household inorganic garbage. Here, the trash will be processed according to its type, such as plastics to be processed into plastic pellets and other dry waste will be sorted as well.
f. Industry / raw materials processing factory, industries such as paper mills, plastics and bottles will buy trash from the Central Waste Bank which is an advantage for them.

The initial steps for women empowerment in waste management used Harvard method. Harvard Model was based on efficiency WID approach that was gender analysing and earliest gender framework planning (Qoriah and Sumarti, 2008). Harvard analysis model was more suitable for project planning, concluding the data basic or data base. Based on the results of the analysis, it could be identified that woman or housewife has a major role in waste management in family level, as shown in Table 1, 2 and 3.

Table 1. Profile Activities

Production Activity	Doer		
	Husband	Wife	Together
Sorting Waste	10%	50%	40%
Solid Waste Processing	30%	35%	35%
Garbage at home	30%	40%	30%
Waste disposal	20%	30%	50%
Activities Reproduction			
Washing clothes	25%	40%	35%
Taking water	55%	15%	30%
Washing the dishes	15%	55%	30%
Bathing children	20%	45%	45%
Cooking	20%	40%	40%
Preparing food	10%	45%	45%
Parenting	30%	35%	35%
Cleaning the bed	25%	40%	35%
Sweeping the yard	20%	35%	45%
Sweeping the room	20%	35%	45%
Pregnancy		100%	
Carrying baby		100%	
Carrying baby	25%	30%	45%
Taking the child for treatment	20%	30%	50%
Accompanying children learn	25%	25%	50%
Shopping at the market	15%	45%	40%
Social activity			
Women Social Gathering Organization (PKK)		100%	
Housewife organization in a community (Dasawisma)		10%	

The results showed that all activities relating the processing of household waste from the waste disposal sorting was dominated by women. As much as 50% sorting activities of waste was done by women and only 10% committed by males. Furthermore, 40% of respondents said that waste sorting was done together. Similarly to other activities that have the same pattern, dominated by the role of women.

The dominance of women in all "production" activities related to waste management was due to its basic nature that were meticulous and painstaking, whose nature was rarely possessed by men. Women were also needed to manage all activities in her house. Besides, male still have a frame think that the work related to the cleanliness of the house was women responsibility.

However, there were many respondents who did their household together between male and female. It showed that respondents were already thought that household was not only women responsibility but also male and other family members (Abdullah, 2012).

Table 2. Access Profile

Resource	Doer		
	Husband	Wife	Together
Soil	30%	50%	20%
Equipment	30%	45%	20%
Cash	25%	50%	30%
Education Training	25%	40%	35%

The results also showed that women/ wives dominated all access of available resources. The husband preferred to trust women in relation to access to existing resources. This implicitly stated that all family members agreed the 'power' of women / wives took over all things and involved in the waste processing of household so that there was an awkwardness in using it. The example was waste processing equipment.

Table 3. Profile Benefits

Benefit	Doer		
	Husband	Wife	Together
Income of waste Processing	10%	20%	70%
Income from outside	10%	15%	75%
Ownership of wealth	10%	15%	75%
Primary needs	5%	5%	90%
Education	5%	5%	90%

The greatest benefit income from waste processing was perceived by the wife (20%), then 70% was felt by the entire family (husband, children, and other family members). Income was very important for families since their income from waste treatment could help the family economics. In addition, the benefits of income for the family could also be seen in the ownership of wealth (eg. waste treatment income used to buy electronic goods or other household items) and primary needs (income used to meet the needs of clothing / food / board). Ownership of wealth and primary necessities could be felt by the entire family with a percentage of 75% and 90%. Furthermore, for education, the impact and benefits shared by all family members by 90%.

Based on these explanations, then model of women empowerment through a policy of partnership in the implementation of solid waste management and action programs of solid waste management at the level of households and industries could be seen in Figure 1.

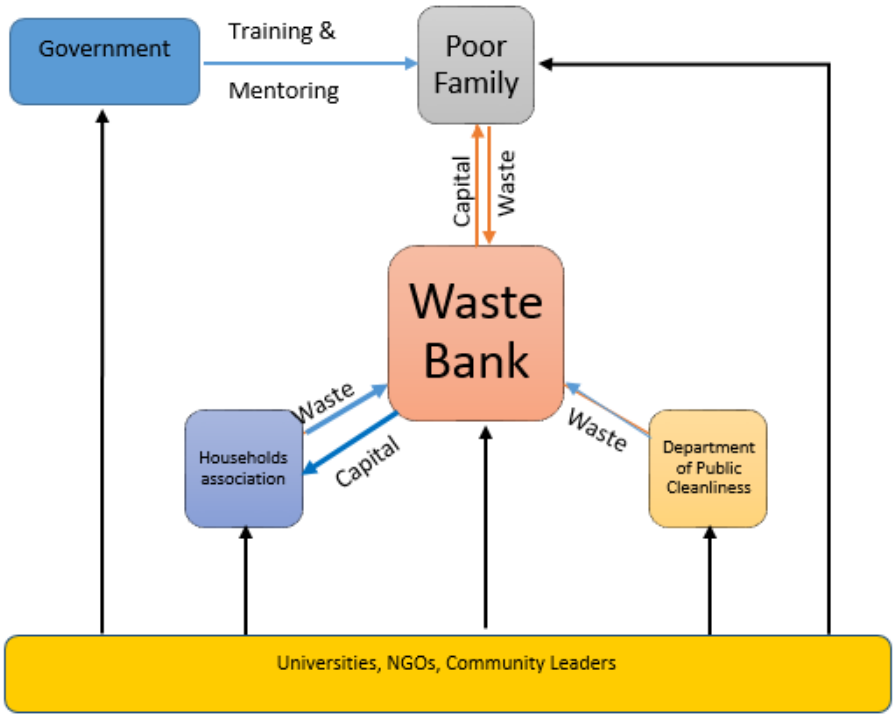

Figure 1. Hipotetyc Model: Strategy to Increase Income of Poor Households Through the Women's Role in Optimizing Waste Management

Information:

a. The government provided training and mentoring to increase ability / skill for poor families, so that poor families can run a business better than capital assistance has been given by the Bank Waste.
b. The business group of women (housewives creativity) handed over voluntarily to the bank waste bins to be managed and could also borrow to run business development.
c. Sanitation Department handed junk has collected the waste banks to be managed and used as capital assistance for poor families and groups of women's businesses.
d. Bank garbage run activities, funds collected (after deducting in costs operating) can be used as capital for poor families and business groups of women (women social gathering activity/PKK). The profits derived from waste banks were not distributed to customers (households), but it managed again as financial aid given to poor families to run their business.
e. A poor family run the business after receiving training and assistance from the government. Poor families paid enough with capital support from the Bank using waste bins worth of capital assistance given.
f. Universities elements, NGOs, and community leaders worked together to provide support and advice to hipotetyc this model can run well and fit for purpose.

Based on these results, the development of waste management could also be managed as a social business as well as the concept of social business conducted by Muhammad Yunus. Yunus (2010) suggested a social business was different from the usual business, where all profits were given back to the company to create more social benefits, rather than paid out as dividends to investors or corporate owners. Yunus social business compareed with some organizations that were directed for social activities such as non-governmental organizations, charities, corporate social responsibility, and various forms of similar social organization. The main difference was the social business seek self-sufficient and not dependent on government or private donations to survive. A social business need also meet the criteria that was not to improve individuals welfare or investors. Unlike charities, social businesses was financially independent, so as it did not have to deploy human resources to obtain donations. Thus, the social business could also be interpreted as a non-loss, non-dividend company, which was dedicated entirely to achieve a social mission.

Conclusion, Suggestion, and Limitations

The results of the study indicated that the economic value obtained from organic waste is Rp. 193, 952, 422 ($14,841.80) per year and inorganic waste is Rp. 223, 142, 710 ($17,077.86) per year. This potential should be properly managed through synergizing the existing waste management agencies such as the Department of Public Cleanliness and the Waste Bank of Malang city. Synergies of waste management should be made up to the lowest level of public institutions i.e. housewives associations, because the role of housewife is very important in the success of waste management.

Therefore, in optimizing waste potential, it must be done simultaneously by several sides who have responsibility in management waste such as the Department of Sanitation and Waste Bank city of Malang. Waste simultaneous management must be carried out to the lowest possible sides like housewives, since the role of housewife is very important in supporting waste management. Thus, the funds collected from the optimization of waste management can be used to help in providing capital for poor families as well as the women empowerment in Malang.

This study only uses a quantitative descriptive approach and in the study sample limited to one housing. Further research can expand the sample by involving several housing or regions with a more comprehensive research approach.

Acknowledgement

This work was partially supported by research funding from the Directorate General of Higher Education (DIKTI) of Indonesia and the Universitas Muhammadiyah Malang (UMM). Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the DIKTI and UMM..

References

Kartasasmita, G. (1996). *Pembangunan Untuk Rakyat: Memadukan Pertumbuhan dan Pemerataan.* Abdullah, I (2012). Penelitian Berwawasan Gender dalam Ilmu Sosial. *Jurnal Humaniora*, *15*(3).

Ahmed, Shafiul Azam & Ali, Mansoor (2004). Partnership for solid waste management in developing countries: Linking theories and Realities. Habitat International 28: P. 467-479.

Ahmed, Shafiul Azam & Ali, Mansoor (2006). People as Partners: Facilitating People's Participation in Public-Private Partnership for Solid Waste Management. Habitat International 30 (2006) 781–796.

Boeni, H., Silva, U., & Ott, D (2008). E-waste recycling in Latin America: overview, challenges and potential. In Proceedings of the 2008 Global Symposium on Recycling, Waste Treatment and Clean Technology, REWAS(pp. 665-673).

Dewi, I.K., Malik, N., and Zuhroh, I., (2009). Potensi dan Manfaat Ekonomi Usaha Pengolahan Sampah Padat di Kota Malang. CEERD UMM

Dias, Sonia and Ana Carolina Ogando (2015). Rethinking gender and waste: exploratory findings from participatory action research in Brazil. Work Organisation, Labour & Globalization. 9:2, 51-63

Djuwendah, Endah (2000). Analisis Keragaan Ekonomi dan Kelembagaan Penanganan Sampah Perkotaan. Research report. Bandung: Lembaga Penelitian UNPAD.

Henry, R. K., Yongsheng, Z., & Jun, D. (2006). Municipal solid waste management challenges in developing countries–Kenyan case study. Waste management, 26(1), 92-100.

Singhirunnusorn, W., Donlakorn, K., Kaewhanin, W., Kpxguvkicvgu, U., Kpbwgpekpi, H., Tge, J., & Dgjcxkqwt, E. (2012). Household recycling behaviours and attitudes toward waste bank project: Mahasarakham Municipality. Journal of ASIAN Behavioural Studies, 2(6).

Madsen, Catherine A. (2006). Feminizing Waste: Waste-Picking as an Empowerment Opportunity for Women and Children in Impoverished Communities. Colorado Journal of International Environmental Law and Policy. 17:1.

Malik, Nazaruddin. (2008). Partnership Between Household, Local Government and Private Sector in Implementation Integrated SWM at the City of Malang. UNESCO – IHE DELF the Netherland.

Malik, Nazaruddin. (2008). Payment Scheme and Total Goverment Expenditure for SWM at the City of Malang. UNESCO – IHE – CEERD UMM.

Manaf, L. A., Samah, M. A. A., & Zukki, N. I. M. (2009). Municipal solid waste management in Malaysia: Practices and challenges. Waste management,29(11), 2902-2906.

Miraftab, Faranak (2004). Neoliberalism and casualization of public sector services: the case of waste collection services in Cape Town, South Africa. International Journal of Urban and Regional Research. 28:4, 874–892.

Noel, Claudel. 2010. Solid Waste Workers and Livelihood Strategies in Greater Port-au-Prince, Haiti. Waste Management. 30:6, 1138-1148.

Outerbridge, Thomas (ed). (1991). Limbah Padat di Indonesia: Masalah atau Sumber Daya. Jakarta : Yayasan Obor Indonesia.

Pargal, S., Huq, M., & Gilligan, D. (1999). Social capital in solid waste management: Evidence from Dhaka, Bangladesh. World Bank, Social Development Family, Environmentally and Socially Sustainable Development Network.

Pasang, Haskarlianus; Graham A. More & Guntur Sitorus. (2007). Neighbourhood base-waste Management: A Solution for Solid Waste Management in Jakarta, Indonesia. Waste Management 27: p. 1924-1938.

Sharholy, M., Ahmad, K., Mahmood, G., & Trivedi, R. C. (2008). Municipal solid waste management in Indian cities–A review. Waste management, 28(2), 459-467.

Qoriah, S. N., & Sumarti, T. (2008). Analisis Gender dalam Program Desa Mandiri Pangan (Studi Kasus: Desa Jambakan, Kecamatan Bayat, Klaten-Jawa Tengah). Sodality:: Jurnal Sosiologi Pedesaan, 2(2).

Yunus, Muhammad. (2010). Building Social Business, The New Kind of Capitalism That Serves Humanity's Most Pressing Needs. United States: PublicAffairs