WASTE AWARENESS AND BEHAVIOR OF BIDARA CINA COMMUNITY AT CILIWUNG RIVERBANK, JAKARTA-INDONESIA

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By

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June 2012

Statement of Affirmation

Astari Minarti

2012

“I hereby declare that the master thesis submitted was in all parts exclusively prepared on my own, and that other resources or other means (including electronic media and online sources), than those explicitly referred to, have not been utilized. All implemented fragments of text, employed in a literal and/or analogous manner, have been marked as such.”

ABSTRACT

WASTE AWARENESS AND BEHAVIOR OF BIDARA CINA COMMUNITY

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By

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June 2012

Thesis supervised by Professor Frauke Kraas

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Bidara Cina community as an example of Ciliwung riverbank community in Jakarta became the attempt of this study to examine their waste awareness and behavior. Waste that flows with the river stream and the pile of waste in the riverbank were suspected as the result of their activities.

Accordingly, the purpose of this thesis aimed mainly to investigate the correlation between waste awareness and behavior. Using a case study, other variables were attached to capture the possibility to link waste awareness and behavior. Another aim was to find out the factors influencing community's waste awareness and behavior.

Explanatory case study was applied through explanation building using causal links and iteration process. The data used has been collected from eleven respondents through semi-structured interview.

The principal conclusion was that waste awareness has most tendencies to increase desired waste behavior if control variable, like the economic value of waste is available.

Keywords: waste, waste awareness, behavior

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LIST OF ABBREVIATIONS

n.d	no date
BAPPENAS	*Badan Perencanaan dan Pembangunan Nasional* (National Planning Board)
BPLHD	*Badan Pengelola Lingkungan Hidup Daerah* (Regional Environmental Management Board)
CAPAM	Commonwealth Association for Public Administration and Management
CSR	Corporate Social Responsibility
DKI	*Daerah Khusus Ibukota* (Special Capital Territory)
ELARD	Earth Link and Advanced Resources Development
Ha	Hectare
NGO	Non-Governmental Organization
NIMBI	Now I Must Be Involved
NIMBY	Not In My Back Yard
PPP	Purchasing Power Parity
RT	*Rukun Tetangga* (Neighborhood Association)
RW	*Rukun Warga* (Community Association)
UNESCO	United Nations Educational Scientific and Cultural Organization
3Rs	Reuse-Reduce-Recycle
4Es	Encouraging, Enabling, Engaging, Exemplifying

CHAPTER 1: INTRODUCTION

This introductory chapter discusses issues surrounding solid waste management in developing countries, in particular with the consequences of limited waste awareness and behavior of Ciliwung riverbank community in Jakarta, Indonesia.

1.1 Background

Solid waste is one of municipal problems that are always experienced by every city in the developing countries. The volume of generated waste of a city depends on its population density. When a city is being over-populated, so the explosion of waste generation is being inevitably occurred. The problem is getting more unhandled, if there is an absence of framework for the cooperation between waste management planner and communities in order to encounter the issue of waste management. Even though the local government has devised a feasible waste management, however it can be lack of effective implementation due to organizational and structural problems[1,2]. It has also been identified that the concern of waste awareness and behavior of communities becomes another additional agenda of local government toward the improvement of waste management practice. It needs effort from local government and community to seek an alternative applicable method for all level of communities and waste management planner (Aprilia et al, n.d).

[1]http://www.jica.go.jp/english/publications/reports/study/topical/waste/pdf/waste_02.pdf Last retrieved Jan 18, 2012; [2]http://www.medwelljournals.com/fulltext/?doi=rjasci.2010.183.190 Last retrieved Jan 18, 2012

Jakarta as the capital city of Indonesia, in fact, does not reflect the characteristic of pilot city of waste management practices for other cities in Indonesia since most of the residents have high dependency to the site of open dumping as one of the principal means of solid waste final disposal.

This attitude has inevitably induced the risk of solid waste pollution to almost every environmental element in Jakarta, particularly resulted water pollution in regards with flooding that occurs annually. The behavior of local community which is likely to throw their household waste into river body seems hardly to overcome with merely adequate management due to their ungrounded perception of river function and limited mobility to accessed waste equipments, even though the government has persuaded them to reduce any waste problems through projects, seminars or workshops and city regulations. It is proven that community still disregard themselves from being subjected to their duty on waste services and responsibility. This empirical deduction brings out the initial notion for investigating the possibility to correlate the level of waste awareness of communities with their waste behavior (UNESCO, 2000, 59pp; Imran, Sarojini et al, 2008 May, 5pp)

An instance of informal squatter settlement along Ciliwung river bank in Jakarta, particularly located in downstream areas, Bidara Cina village becomes an attempt to examine current waste awareness and behavior. These settlements are inhabited by low income groups with low average level of education. Their behavior that tends to treat the river as the 'final disposal' for their household waste has evidently reflected a critical point of waste awareness and behavior. The effective measurement of local government should take account of community's capacity to absorb significant information regarding their waste management. It is equally important to discover the result of the relationship between waste awareness and behavior (Tarigan, 2008; BPLHD, 2012).

Bidara Cina village is classified as one of slum areas in East Jakarta located along Ciliwung riverbank. According to Public Works Department in Jakarta (2011), there are three community organizations (*RW*)[3] of Bidara Cina that experience the most apprehensive condition among other community organizations, specifically *RW* 05, 07 and 14. Presently, these three areas have always been being inundated and high densely populated, the community constantly dispose their waste to the river and the structure of community is mostly composed by low average level of educated people thus have lacking salable skills and economic opportunities. Being risked at flooding does not seem to arouse their waste awareness and behavior. In addition, these three *RW*s posses problems in common for city sanitation facilities, such as the clogged drainage system due to garbage sludge, the lack of containers and scarcity of land for the composting as well.

Based on these commonalities, the analysis over the research of the correlation between waste awareness and waste behavior toward waste management practices will be devoted to the communities that live in *RW* 05, 07 and 14 in Bidara Cina. They will be examined through their perceptions over their household wastes that affect their waste behavior. This research study will therefore provide an overview of the phenomena of waste practices within Bidara Cina communities. The findings of this research are generally to create the contribution to the effort of waste management planner and Non Governmental Organization (NGO) for conducting the effective and appropriate design of waste campaign or waste management improvement programs that may correspond to community's intention and their neighborhood.

[3]RW is community association which may consists of 5-10 RT or neighborhood association Retrieved Jan 22, 2012 from http://www.proz.com/kudoz/malay_to_english/certificates_diplomas_licenses_cvs/3527552-rt_rw.html

1.2 Thesis Statement

In this research, the possibility to correlate waste awareness and waste behavior of riverbank community will be analyzed. The influence of socio-economic indicators will be measured to seek if there is any factor that would be subjected to the waste awareness and behavior. The community is selected due to their habit to dispose their household waste into the river thus generally induces local flooding.

The limitedness or broadness of community's waste awareness will be assessed through the knowledge of waste management system within their waste daily practices. A measurable awareness of waste is predicted to be one standard for measuring waste behavior. If this perception is allowed, then their behavior will perform either in positive or negative result. This behavior will be evaluated through the implementation of waste management hierarchy for handling the rest of waste generated at their home and neighborhood.

1.3 Research Questions

The research is specifically related to Bidara Cina community. The research questions of this thesis are:

1. How does community's waste awareness affect their waste behavior?
2. Why does community commit to waste littering into river?
3. What are the community's activities that already taken in order to run waste management?
4. Is the community being familiar with the waste hierarchy system, such as 3Rs?
5. Is there any conflict between communities and local government in order to run their waste management?
6. How to reach the ideal requirement of waste management and hierarchy practices in order to improve community's waste awareness and behavior?

1.4 Main Objectives

This thesis has four main objectives. The first part of the objectives are to provide an overview of the current existing condition of solid waste management focuses on household waste, and to find out the factors influencing community's waste awareness and behavior. The second part of the objectives is to analyze whether there is any correlation between Bidara Cina community's awareness and waste behavior within waste management hierarchy practices at the level of household and last to provide recommendations for the stakeholders who are concerned with the waste improvement in Bidara Cina. Both these two pre-identified variables and socio-economic indicators will facilitate local government and non-governmental organization to design any further improvement program of existing waste hierarchy management in order to promote a pleasant environment with respect specifically to community's neighborhood.

1.5 Scope and Limits of Study

In this research, the waste awareness and behavior were only examined to the head of families and housewives of the selected community, with the suppression on their level of waste knowledge and waste practice. Many factors as indicators of socio-economic can be suggested to indicate the influence on community's waste awareness and behavior, however only the socio economic indicators toward social vulnerability will be selected. Two type factors that may affect waste awareness and behavior namely internal factors such as the age, the level of education, the level of income, the length of settlement, the distance from home to river and the residence status. Meanwhile, another factor that may affect waste awareness and behavior is external factors like the role of leader and government's approach.

1.6 Research Design

The design of research is helpful for constructing all the major research materials to address the prominent research questions. For this study, research design is expected to reduce the ambiguity when drawing causal inferences from evidences (de Vaus, 2001, 2pp; Ditsa, 2004, p.763; Trochim, William M.K, 2006). Table 1.1 outlines the principal research design and methodology components applied in this study. The details of each aspect will be presented in Chapter Three.

Table 1.1 Summarized research design and methodology

Attributes	Characteristics
Nature of Research	*Explanatory Case Study*
Unit of Analysis	*Groups*
Time Dimension	*Cross-Sectional*
Research Methodology	*Field Study*
Data Collection Method	*Semi-structured Interview*

Source: Author, 2012

1.7 Structure of Thesis

Subsequent to this first introductory chapter, Chapter Two reviews the literature from a number of different areas due to the inter-disciplinary nature of the field within urban and its community. It begins by defining urban environment and its link with waste management issues in several big cities in Asian countries. The character of riverbank community in regard with their waste awareness and behavior is also discussed as it is the midpoint of discussion. The chapter also reviews significant factors that may be able to affect the result of study. Finally, some previous studies of waste awareness and behavior are reviewed in order to develop complete view of waste awareness and behavior in slum areas.

Chapter Three describes the methodology for the thesis. It takes an overview of the study with a description of site area selected in this case study research at the beginning. This chapter also takes a view of researcher's situated perspective as the reflection of individual's

experiences and description of life situations and rationale for research in order to get the answer in the initial questions as unambiguous as possible. Meanwhile, the method emphasizes on case study which has been supported by field research during the observation using open-ended questionnaire in semi-structured interview. The use of questionnaire checked by expert and pilot-testing which attempted to enhance validity and reliability. Finally, the issue of ethical considerations of the study is considered to strengthen the pertinence of the research process and recognizing the researcher's biases.

Chapter Four presents data analysis and findings. Explanation building is used to analyze this case study through the causal links of waste awareness and behavior, along with the iteration of evidences. The analysis relies on the themes and categories. Informants' responses are established in narrative forms to reveal the fact and phenomenon with respect to their waste awareness and behavior which are supported by reviewed literature from Chapter Two. To conclude, the findings are examined through iteration and data sources triangulation.

Chapter Five is a discussion for illuminating and emphasizing the most salient findings of this study which are correlated with some additional research literatures. Defra's philosophy, Sustainable Development Diamond or 4Es is presented to give the solution for the current issues, like engaging community's participation and empowering them. This chapter also establishes implications for theory and practice to show the use of this research for waste management planners and to corroborate the theoretical basis use in this research. Lastly, the implications for further research promote other approach as the solution to be examined under the similar topic.

Chapter Six contains the major results of findings to address the objectives of this study in a scheme of conclusion, including practical recommendations for raising awareness and changing behavior. This chapter also expresses the limitations of this study and ends with closing remarks.

CHAPTER 2: REVIEW OF RELATED LITERATURE

This research uses three frameworks: urban environment with emphasizing on peculiar concept of waste management of riverbank community as well as waste awareness and behavior of its community. Since the primary focus of this research is to analyze the correlation between waste awareness and behavior of riverbank community and to find out any factor that influences them, we therefore have to understand about the definition of urban environment and its relation with riverbank community in order to promote theoretical ideas on how waste awareness and behavior of riverbank community can lead to either valuable or disserve impacts toward the growth of environment.

2.1 Defining Urban Environment

How do we define what is urban environment? What constitutes the urban environment?

Urban Environment is a complete living entity of a town or a city with its developed infrastructure facilities. The necessity of society infrastructure shapes evolving layers that become a complex system which has two divergent sides; the first one is a well-managed area with lavish infrastructure, and the other side is unfortunately remains as the slum area with reduced facilities.[4] Urban Environment also describes community which is differentiated by their culture, ethnic and social life system they embrace, thus it creates different perspectives as they perform their respective role. Based on ‘’*Environment Assessment of Nepal: Emerging Issues and Challenges”*[5], a sustainable city is generally judged from the progress of its social, political and cultural aspects.

[4]http://ftp.rta.nato.int/public//PubFullText/RTO/TR/RTO-TR-071///TR-071-02.pdf p.1 Last retrieved Jan 31, 2012

[5]http://www.adb.org/Documents/Books/emerging-issues-challenge/chap8.pdf, p.103 Last retrieved Nov 03, 2011

Urban area as the centre of those three activities provides facilities and infrastructure for society in order to develop their livelihood. Unfortunately, the same society tends to generate pollution and waste as the remainder product of their activity that leads to urban environment problem. It is technically depicted when an urban area of a city has been overloaded of its carrying capacity as the consequence of mismanaged activities of urban consumers; therefore, it causes deterioration of urban environment quality. A city always needs time to build the infrastructure and services which eventually aims for completing society needs. However, the issue of developed city always attracts people to transmigrate from one urban area to another which supported by the advanced transportation facilities that accommodate people to accelerate rapid urban growth. This migration pattern has confounded the concept of urban planning by adding the presence of uncontrolled living space and more pollution. Moreover, Tim Campbell (1989), found "*most cities in developing countries are unable to prevent inappropriate uses of land such as settlements in swamps on hillsides, in floodplains and on food producing land."* (p.56)[6]

Basically, many predecessor researchers have categorized the complexity of urban environment problem purely based on the environmental sector. The level of society's consumption subsequently raises, thus environmental impact is getting wider. In order to being responsive to environmental problems in cities recently, David Satterthwaite (1997) divided urban environmental issues into five categories*: "environmental hazards within the human environment, high use of those renewable resources that are only renewable within finite limits, high use of non renewable resources, high levels of non-biodegradable waste generation and over-use of the renewable sink capacity* (cited in Bai & Imura 2000, p. 138)".

[6]http://books.google.de/books?id=BR_zWeWM..……, p.56 Last retrieved Oct 26, 2011

Waste constitutes resources that are generated by every element of urban dwellers. National, regional or local government, communal groups, private individuals or corporation are entitled and obliged to take account of waste around their vicinity. Basically, waste can be benefited or neglected as it has the characteristics of an open access resource for community (Furedy 1989, cited in Richardson, David W 2003, p.14).

In order to deal with waste problems, social researcher Hardin (1968, cited in Richardson, 2003, p.14) focused on the view of shared responsibility activities, as he stated that *"collective action (achieved through coercion) is essential for reaching a socially desirable solution. In this way, the problem of waste or dirty streets can be viewed as co-operation problem.*" Meanwhile, Sen (1973) preferred to get solution of waste problem by household effort consistency for maintaining the neighborhood free from waste. His notion is illustrated by the situation of two households who have the access to a street, if they both work together to take care of the street free from litter, it will result in the clean street. However, they have to deal with some costs which defined by Sen as "*additional effort or loss of leisure time"* (cited in Richardson, 2003, p.15).

Basu (1997), explained the inclination of society to view the street as the "legal facility" for littering, this action has been seen as a cheaper alternative rather than put any effort or cost to handle waste. Unfortunately, some solutions that have been offered by researchers may seem not rational to compare with public's desire that tends to ignore the benefit of shared responsibility with other and alternative effort and cost to create a snug environment. A public good character will fail to generate the shared of responsibility and the streets eventually will full of litter (cited in Richardson, 2003, p.15). After all, it is very important to increase people's awareness because it is a hard challenge to conserve and sustain the value of physical urban environment after being used for satisfying people's endless need and to protect future life (Shimomura & Matsumoto, 2010, p.18).

2.2 Riverbank Community

Literally, riverbank can be mentioned as the land located in the area of river, which is exactly at the top of bank. To limit the understanding, the top of bank area is the location of large terraced area from the riverbank to a higher land area.[7]

According to Victoria (n.d, p.271) explained the community as "*a group of individuals and households living in the same location and having the same hazard exposure, who can share the same objectives and goals in disaster risk reduction*".[8] In writer's opinion, riverbank area in developing countries especially in Indonesia can be typically linked to slum areas. The dwellers of the riverbank area are the frequent survivors of flood. Some of them consider flood as the result of littering around river and some other consider flood as the flash flood brought by the upstream flow. Similarly, slum is a part of the urban area which remains without urban planning and services and local recognition or rights. This is due to the negligence of government in providing urban policies to cope with dysfunctional land and housing market. Slum is an identical area with high risk location, such as hill-sides, garbage dumps and riverbanks. Unfortunately, the slum dwellers have to get accustomed to the state of limitation where several or all of basic municipal services and social access are omitted.[9]

2.2.1 Physical Aspects

Location and Living Conditions

A large picture of location and living condition of urban poor is established through the frame of living in inconvenient land, such as cemeteries or interstitial spaces[10]. Squatter house is generally built in pavement or dilapidated tenements using flimsy scrounged materials.

[7] http://www.pdc.us/pdf/dev_serv/pubs/willamette_riverbank_design_notebook.pdf p.5 Last retrieved Jan 25, 2012

[8] http://unpan1.un.org/intradoc/groups/public/documents/APCITY/…. p.271 Last retrieved Jan 25, 2012

[9] http://www.forum-urban-futures.net/files/Mr.%20Raditya.pdf... p.2 Last retrieved Jan 26, 2012

The poor goes into a room, crammed with several families or subdivide a large residential buildings. Squatter areas show one key feature that they are built in illegal or lack of tenure rights land. The poor tends to ignore the greatest risk that may happens to young children, even the need of secure feeling is ruled out by living in the dangerous locations, for example next to railroad tracks or on riverbanks, floodplains, or landfill sites. The squatter dwellers are also used to dealing with house eviction. Settlement plan has been rarely implemented, work opportunities are only abundant in cities center, and however, old land and the new areas are located in the periphery (Fry et al, 2002 May, p.35).

Fry et al, (2002) continued, one characteristic of developing cities in the world regarding the waste is around 20% to 50% of all solid waste left over from waste collection. This matter obviously appears in informal settlements where the physic features of the street is too narrow, more likely to be alley, on steep hillsides, thus the truck is not able to pass. Garbage becomes a commonplace for children, scavengers, and health hazard source at once (p.39).

2.2.2 Social-Economy Aspects

A common perception over urban poor community and poverty is determined from the state of marginalization, illiteracy, and class and caste status, even through gender. However, the informal sector through its low payment and insecure jobs has given urban poor community the chance to be self-autonomous in fulfilling their utility, build their house and to provide their own job. It proves therefore they are being determined yet becoming a mobile pioneer as they are essentially entitled of resourcefulness.

[10] Interstitial spaces or interstice is an empty space or gap between spaces full of structure or matter. Retrieved Feb 03, 2012 from http://en.wikipedia.org/wiki/Interstitial

Urban economy won't be balance if urban poor community does not play their role in urban pool, such as traders, manufacturers, and service providers. Even though they live in urban poor or squatter settlements, in fact they belong to definite agglomerations which are gradually becoming stable and homogenous communities (Fry et al, 2002 May, p. 42).

2.3 Waste Awareness of Community

Solid waste management is one kind activity of local body invested by municipal or government fund, which involves active community's participation to succeed[11]. According to Hillery (1995), "*early sociological points out that community always need a locality and interaction".* Recently, the new generation of community tends to make less demand for a common physical locality, yet the most important is the existence of interaction between the rest of community. If the community is able to maintain their frequency of interactions that means the medium of common communication is available from common protocols and shows the awareness of the existence of membership in the community (cited in Koch, 2003, p.8).

Bekin and Szmigin (n.d, pa.4) released that there are some actions regarding waste management to show the care for the community. However, the theory of community here needs to be explained in the scope of geography's early definition in order to support the work of sociologist, therefore, the community means "*a group of people or organisms who interact and live within the same geographical area".* Community typically consists of households living together in an authorized area which creates complex structure and divided into several social groups. By that means, municipalities as the agents who provide the waste collection service should be heedful in order to accommodate the cooperation with them[12].

[11] http://urbanindia.nic.in/publicinfo/swm/chap18.pdf Last retrieved Jan 28, 2012, p.410

[12] http://www.environment.gov.za/nwmsi/Recycling/Guidelines/Collection/Coll_chap4.pdf Last retrieved Jan 28, 2012,p.13

The co-operation must be arranged in a system for which the service is intended since the community is compiled with many characters. For instance, people who live in a subserviced area are used to burning their waste as the results of refusing to participate in planned service delivery and incapability of paying for the service. This case can be avoided by prioritizing community's opinions and preferences for the planned service. If municipalities work through the method of allowing community awareness campaigns and participation, it will definitely support the operation of system[13].

The correlation between community awareness and their willingness to cooperate and participate can be seen in adequate waste management practices. If good waste awareness is embedded through community, it will affect the population's willingness to create participation, for example carrying waste to a shared container, segregating waste to assist recycling activities, or paying for waste management services without any pressure (Zurbrügg, 2003 Feb, p.8). The real example of the correlation between waste community awareness campaign and participation of community has been established since many years ago in Yogyakarta, Indonesia through the action of municipal governments who have introduced and promoted the concept of organized citizen participation and involvement in primary collection plan. By using handcarts for house to house collection which are managed by the community or neighborhood units, thus, it has contributed an important movement in the city's solid waste management system[13]. Zurbrügg (1999) added this activity has commenced another useful activity such as recycling of the organic fraction by composting. Another developing country has the example, a case study of community-based solid waste management in Nagapura, Bangalore which was done by Muller (2002), concluded that "*the degree of participation of households in the new collection scheme is rising, especially after each round of awareness rising*" (cited in Shukor et al, 2011, p. 970).

[13]http://www.environment.gov.za/nwmsi/Recycling/Guidelines/Collection/Coll_chap4.pdf Last retrieved Jan 28, 2012, p.14

Naturally, the success of community participation in solid waste management is derived from awareness factor (Joseph, 2006, cited from Shukor et al, 2011, p. 970). Thus, it will be much easier for people to comprehend the cause, the effect and the situation especially the issue that occurs as well as to develop their role in the participation to manage solid waste (Minn et al, 2010, cited in Shukor et al, 2011, p.971). The potential in a community such as social customs (through scheduling meetings, taking local behavior into account for clean-up actions) or the added value of the basic scale of action must be totally explored in order to succeed the result of awareness campaigns (Subash, 2002, cited in Shukor et al, 2011, p.971). People tend to create their awareness when they are being concerned over their responsibility and play their part in maintaining hygiene and health. However, a clear explanation about their role and responsibility are substantially needed by community and surely provided by local authorities. Hence, community knows the limitation of local authority services; therefore, community is able to be a sub-agent of local authorities to cope continually with waste management problem (Zurbrugg and Rehan Ahmed, 1999, cited in Shukor, 2011, p. 971).

2.3.1 Waste Education

The attempt of people to priority waste management is very low since people tend to disregard the health hazard from poor waste management. By this fact, raising awareness should be on the first agenda of community education program to bring people to fully comprehension about the impact on poor waste management. In result, people will have new paradigm over the importance of effective waste collection system[14]. Sridhar & Baker et al (n.d), explained that waste management is practically embodied through basic and fundamental elements, namely communication and education. These also encompass formal institution of education which ranges from kindergarten to college as the means for spreading the information.

[14] http://www.environment.gov.za/nwmsi/Recycling/Guidelines/Collection/Coll_chap4.pdf Last retrieved Jan 28, 2012, p.16

In addition, all the sectors may take part of their role through either formal or informal institutions. Some professionals of creative work are hopefully able to present attractive appeal through any slogan such as “greener behavior” to influence community (p.331). According to Mull (2005, May) on his thesis, it is therefore obvious that education program is required to overcome waste management issue at individual and community level through the development of knowledge, value, skill, experience and determination. By launching this education program, it will accommodate a better community institution to carry on the norm in social construction as a community based education (p.7).

2.3.2 Community Empowerment

According to Mockler’s studies (1998), Indonesia has been embracing community empowerment for solid waste management since the early 1980’s, organized principally by various institutions including projects by Indonesian and international institution, government departments, municipal governments and private companies. Two main activities in the scope of solid waste management, namely recycling and composting, might be used as the tool to attract community’s initiative at household level to do waste separation. The purposes of this project are regularly to teach people the technical aspect of community based composting, management, economic feasibility, self-funding mechanism. Through this step, people are expected to get used to correlating primary and secondary solid waste collection system effectively to their household level actions. Nevertheless, the lack of financial incentives is able to discourage people for continuing the actions when they fail to provide a sufficient volume of organic waste to generate required quantities of compost to sell. This case was noted in Jakarta, only four of fifteen projects have passed the hurdle on household waste separation for composting and recycling (cited in Richardson, 2003 Jan 10, p.6).

Reviewing what should be the content of community empowerment, interest and sense of ownership clearly must be the two key requirements in order to develop community willingness to participate. A few researchers who involved with community research indicated the power that has been given to community may open their eyes to see discernibly how a little act contributes a big impact on their lives. Community will give more participation once they have gained all the control of their lives through empowerment. There are four approaches to empower community; the first approach is through leading discussion to convince community and to accommodate the inquiries of the plan, budget, job details, and specification of work. The second approach is inclusive which purposes to bridge the gap for races and religion differences among community through the shared forum of expertise and experiences. The third approach is arrangement by showing the real issue of solid waste management directly to community so that they will be called to involve with the project without any coercion. The last approach to empower community is affected, that means allowing people to affect the activities and services through community involvement to create the project scenario (Shukor et al, 2011, p. 969)

2.4 Waste Behavior of Community

Two types of campaign are commonly used to induce impact on community behavior, categorized as program campaigns and information intensive campaigns. However, a research indicated the acceleration of knowledge and attitudes do not always provoke a behavior changing in community, one example of this happened "*when 500 people were interviewed regarding their personal responsibility for picking up litter, 94% acknowledged responsibility but when leaving the interview, however, only 2% picked up litter that had been "planted" by the researcher"* (Bickman, 1972 cited in Mohr, 2000. p.544).

Anschütz (1996, p.17) explained some actions which might be linked to supporting waste behavior of community in order to show their participation, namely:

1. Adapt daily habits to agreed solid waste system (rules, schedules, e.g. to offer it at the right time and place to the collection team)
2. Bring garbage to communal collection point for transfer
3. Store garbage in a plastic bag, a special bin etc.
4. Cooperate in clean-up campaigns
5. Keep house and immediate environment clean (drains, streets in front of the house)
6. Separate waste in organic and non-organic, wet and dry, keep plastic, paper etc, apart
7. Compost the organic fraction in own backyard.

2.4.1 Factors Influencing Behavior

Meidiana and Gamse (2010) found in common activities of Indonesian waste treatment; people are more likely to choose less effort of actions, such as open waste burning, buried waste and disposal to the river when local service cannot establish waste collection for them (p.202).

Behavior is mankind values that lay in cultural aspect which people are attached to[15]. Community behavior is attached to new ones through the successful adaptation of intensive, long-term, and creative social marketing. To get people automatically generate less waste, options are always available for community to choose which method they are fond of each offered proper waste treatment, for instance reusing materials, altering consumer behavior, or composting food and yard waste.

[15]http://imagineechoprojectswaste.blogspot.com/ Last retrieved Feb 10, 2012, p.10.

The important task of having an effect on behavioral change is to figure out which influencing factors that encourage each individual to change the behavior of waste management (Post, 2007, p.20). A few researchers found the change of behavior in regard with proper waste treatment was not absolutely determined by demographic variables. For instance, one research indicated not any demographic factor could be the influencing factors of recycling, while other determined a high income level could influence the behavior of doing the waste recycling. In more complex research for both typical of waste treatment behaviors, those are waste reduction behavior and waste recycling behavior seemed to include most of demographic behavior. Moreover, source reduction behavior also included several variables and added with household size as well (Post, 2007, p.26).

2.4.2 Leader Role toward Changing Behavior

A community based organizations is created by a good local leader which may be recruited by community or government because of many reasons, for example status in a local culture, given authority from government or personal status in a community. Three types of local leaders that are classified based on their different role in solid waste management, constituted as traditional leader, formal leader and informal leader. The existence of traditional leaders are due to family a community who still embraces local wisdom for taking care of their neighborhood and family descendant rules, while the formal leaders are chosen by authority in order to be the local representative of local authority. Further, the informal leader is considerable pointed by looking at their significant activities for organizations within community, such as political parties, churches, youth and women organizations, neighborhood community, etc. Based on research in community experience, formal and informal leaders are two characters who play more influential parts in solid waste management rather than traditional leaders. The task descriptions of them in solid waste management services for

community based organizations are to allow the contribution of participation in solid waste management services and keeping the contact both with municipality and community[16].

Primary and secondary waste collection systems are two integrated vital steps in solid waste management which are purposefully coordinated by local authorities and community based organizations. Through the process of coordination, community sometimes meets the absence of services or responses from municipal agency. So, they could force the intension toward management committee for the shortage of primary waste collection system and toward the mayor of municipality agency for the lack of facilities of secondary waste collection system. In bridging the contact between community and governments, therefore the local leaders are assumed to establish education and awareness rising, run the control of behavior household to adapt the accepted rules and schedules, and particular role of traditional leaders to mobilize the community to be informed about clean-up campaigns (Anschütz, 1996, p. 19).

2.4.3 Government's Approach

Mongkolchaiarunya, (2005) showed in regards with promoting the proper solid waste management, several Asian countries seek the chance to socialize recycling initiatives program to the community. The ideas of recycling turned into a business established by throughout involvement of national government, local government, private and communities. The benefits that were taken by communities, such as loan from and sold recyclables to waste shopkeepers and received a great deal of subsidiary funds of recycling projects from government.

[16]http://www.globenet.org/preceup/pages/fr/chapitre/reflreco/reflex/modepart/b/a_b.htm, Last retrieved Jan 30, 2012, p.6

The excitement of community was likely to be the concern of project when the government of Singapore ran a great breakthrough over the recycling projects, however, people only showed less excitement, thus, the project was fruitless (p.29). Unconsciously, the problem of solid waste management can be the source of national apprehension as it was once encountered by Indonesian citizen. The national government of Indonesia has declared the date of February 21 as the National Waste Day, to commemorate the tragedy of mountains of garbage in Bandung Landfill that created a huge disaster in 2005 with the loss of more than 100 people. In order to optimally reduce the waste from the source, the national and regional development set up the priority programs to urge people implementing the project of 3Rs (Reuse-Reduce-Recycle) at neighborhood level (Aprilia et al, 2012, p.3).

2.5 Summary

This chapter explored the complexity of urban environment problems in developing countries; one of them is waste issue. It also explored the particular aspects of riverbank community in some Asian countries and their actual waste practice. The importance of findings and experiences from the previous researches in regard with waste awareness and behavior were also outlined. Finally, the factors predicted which might have influenced waste awareness and behavior within riverbank community were also reviewed. The next chapter will discuss the research approach and the data collection methods which were chosen for this study.

CHAPTER 3: STUDY AREA AND METHOD

This chapter introduces the general overview of the study area with the restatement of objectives and research questions, site selection and researcher's situated perspective as well as rationale for the research design. The method of this study divides into three parts namely participants, materials and procedure.

3.1 Overview of the Study

The preferred methods in this thesis were due to the nature of study. In order to be able to understand the purpose of this study, the objectives of the research have to be repeatedly stated in this section which consist of four parts, specifically to provide an overview of current existing household waste practice, to find out the factors influencing the community waste awareness and behavior, to analyze whether there is any correlation between community awareness and their waste behavior and last to provide recommendations for the stakeholders. Moreover the research questions have been summarized to support the approach development for analyzing data which were certainly assigned to several points such as the correlation between household waste awareness and trend of household waste behavior, waste knowledge, practice and management within household and community, and any conflict that occurs between government and communities as well as the ideal solution for the recent problems.

3.1.1 Site Selection: Bidara Cina, Jakarta

The village of Bidara Cina community is administratively located in the east of Jakarta municipality within Jatinegara sub-district. Bidara Cina consists of 16 *Rukun Warga* (*RW*), 189 *Rukun Tetangga* (*RT*)[17] with the total area of 126, 10 Ha.

The deployment of *RT* in each *RW* is respectively presented as follows in Table 3.1.

Table 3.1 The numbers of *RW* dan *RT* in Bidara Cina

No	*RW*	Numbers of *RT*
1	01	9
2	02	14
3	03	12
4	04	10
5	**05**	**6**
6	06	15
7	**07**	**18**
8	08	16
9	09	14
10	10	16
11	11	13
12	12	8
13	13	4
14	**14**	**9**
15	15	10
16	16	14
Total		**189**

Source: Public Works Dept.Jakarta, 2011

Geographically, the position of Bidara Cina profile is bordered to the north by Kampung Melayu and Bali Mester villages within Jatinegara sub-district, to the east by Cipinang Cempedak villages within Jatinegara sub-district as well as to the south by Cawang village and to the west by Kebon Baru village within Tebet sub-district of South Jakarta municipality. These villages mostly exist in lowland areas on the banks of the Ciliwung river within East Jakarta (Figure 3.1)

[17]RT is neighborhood association which may consists of 10-20 houses/households Retrieved March 1, 2012 from http://www.proz.com/kudoz/malay_to_english/certificates_diplomas_licenses_cvs/3527552-rt_rw.html

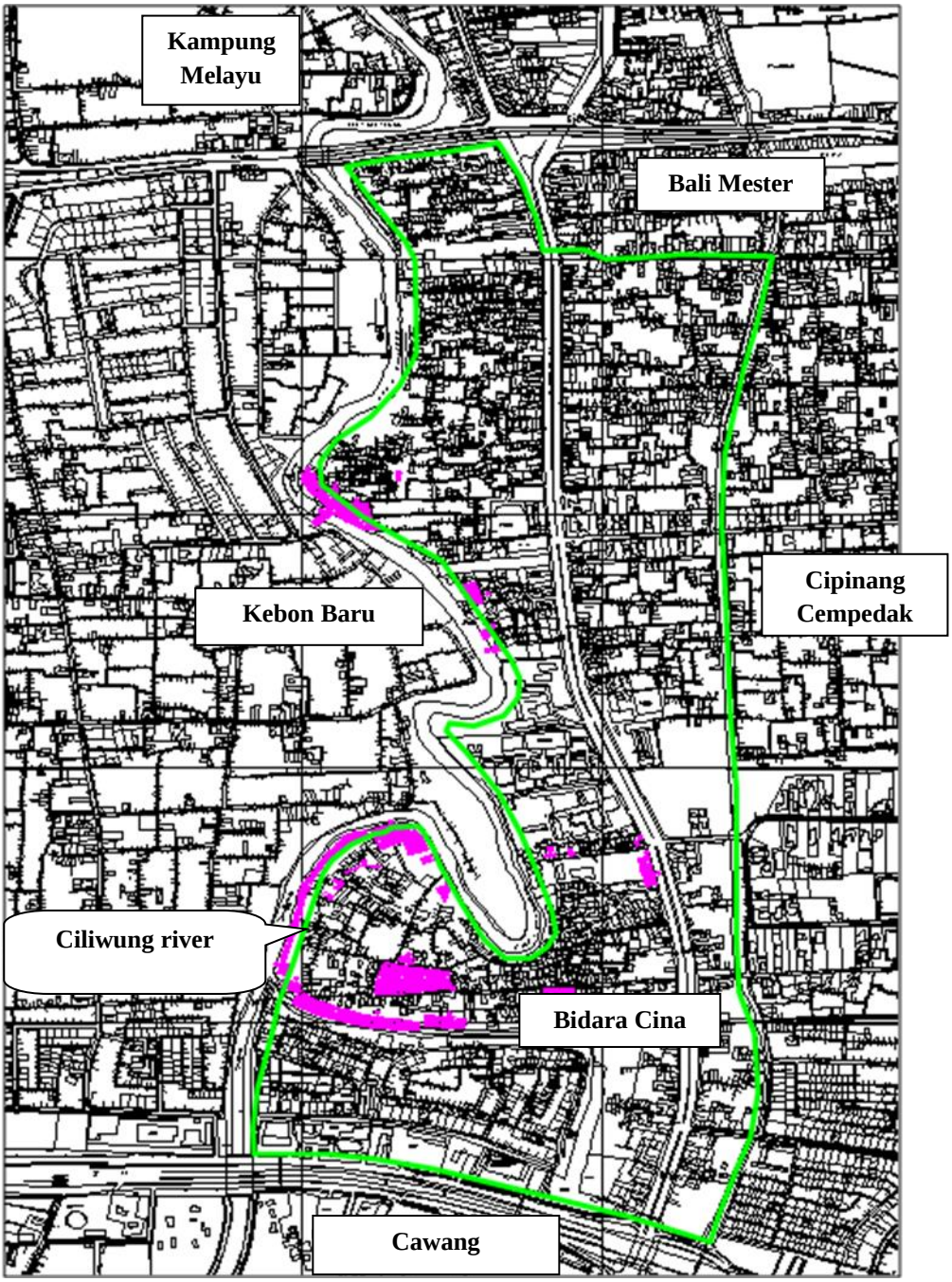

Figure 3.1 Geographic map of Bidara Cina
Source: Public Works Dept-Jakarta, 2011

The study area was situated in *RW* 05, 07 and 14. Based on field research and secondary data, the consideration for choosing these three communities was due to the similarities of physical condition and communities' characteristics, as well as the typical presence of non-permanent squatters along river bank. The restriction area of each *RW* is jointly shown in Figure 3.2.

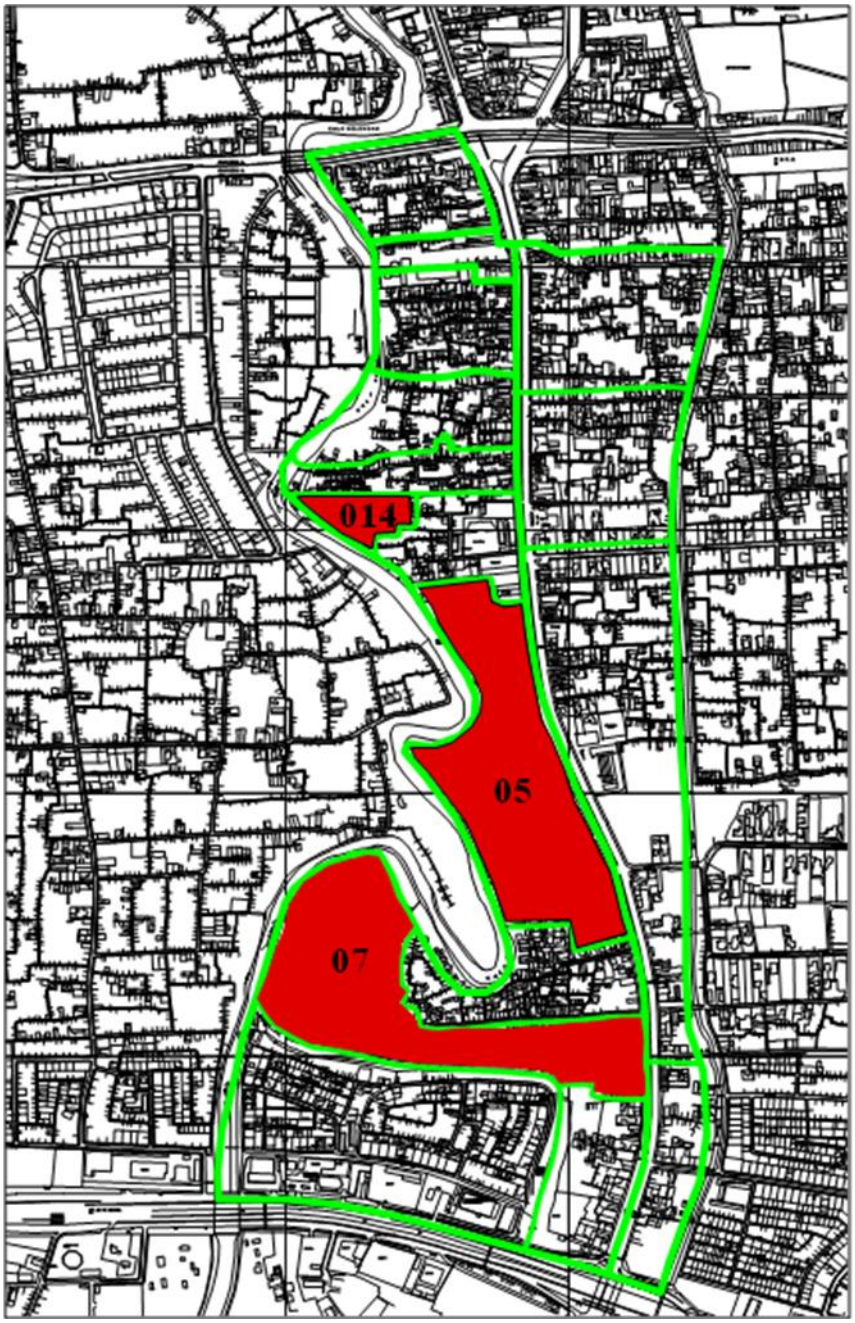

Figure 3.2 The orientation map of study areas (RW 05, 07 and 14)
Source: Public Works Dept. Jakarta, 2011

3.1.1.1 Physical Condition

According to the annual report of Public Works Department of Jakarta, physical areas of Bidara Cina are divided into two landscapes, namely west landscape and east landscape.

Since the author's concern of study area was only for *RW* 05, 07 and 14, therefore, the study only explained west landscape since these three *RWs* belong to the west landscape area. The characteristics of west landscape area are therefore influenced by Ciliwung river which render the community of west landscape area is typically called as river bank community. The areas of west landscape, particularly the area of riverbank becomes the flood-prone area in the rainy season as the formation of the land inclines from east to the west. The issue of flooding hit Bidara Cina was reported by Berita Jakarta on November 18, 2011, as follows:

"High intensity rain in upstream caused thousands of houses in Bidaracina and Kampungmelayu Urban Village, Jatinegara Sub-District, especially in Ciliwung riverbank, East Jakarta, flooded for 50-150 centimeters height since 5 AM, Friday (11/18). As a result, residents evacuated to some mosques at safer location."

3.1.1.2 Land Use Functions

Bidara Cina's spatial design was planned by splitting into two sections of the thoroughfares. Three basic patterns usually underlie the display of urban areas: radial, grid, and irregular[18]. Based on author's observation, *RW* 05, 07 and 14 follow the rules of land-use function with radial pattern of irregular lesser road with public or social facilities as the principal focal point of the area, yet unorganized therefore may not allow big vehicle to traverse (Figure 3.3). To date, the existing land use in Bidara Cina is functioned as settlement, offices, modern and traditional market, and riverbank area which has been intervened for community's settlement as pointed at Figure 3.4 and Figure 3.5.

[18] http://www.globalsecurity.org/military/library/policy/army/fm/3-06/chap2.htm Last retrieved Feb 15, 2012

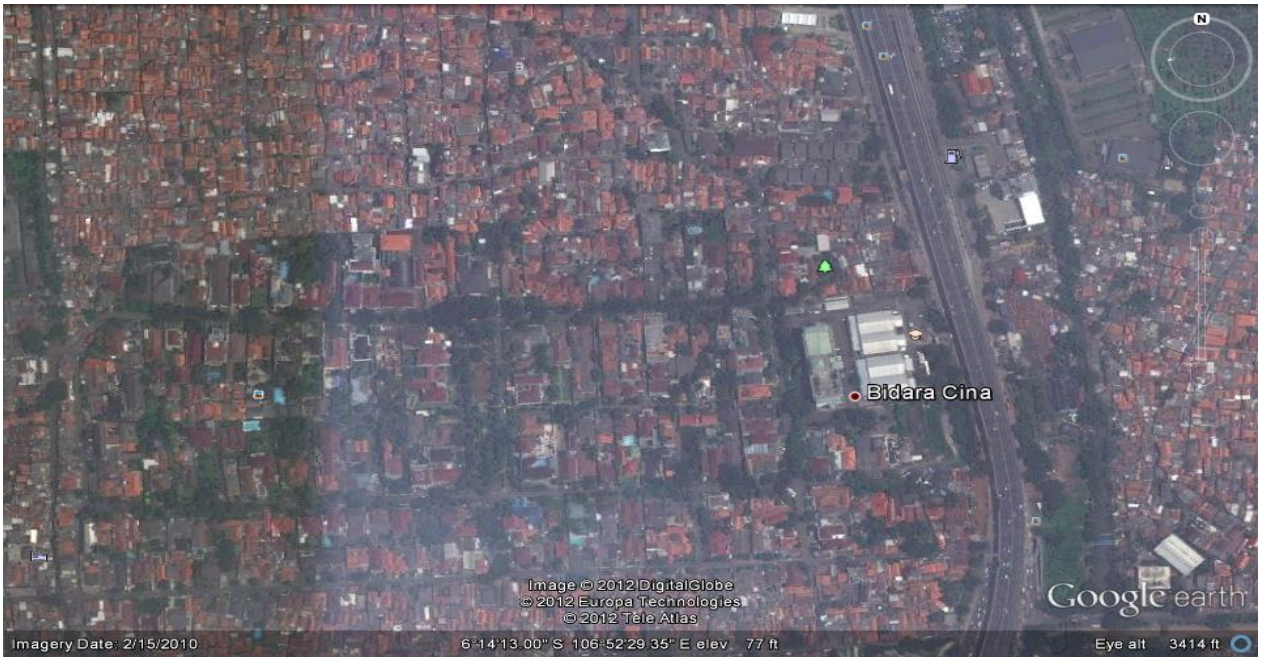

Figure 3.3 Satellite map of lesser road pattern in Bidara Cina
Source: Google Earth, 2012

Figure 3.4 Riverbank area in Bidara Cina which used partly for settlements
Source: Author, 2011

Figure 3.5 Riverbank area in Bidara Cina which used partly for settlements
Source: Public Works Dept, 2004

Public Works Department of Jakarta (2011) visually assessed the existing allotment land of Bidara Cina, typically west landscape area that has deviated from Regional Spatial Planning of *DKI* Jakarta for the year 2010 with most of concern was for the land use along riverbank area. Specifically, the total area for each of land allotments is shown in Table 3.2.

Table 3.2 Total area of each land allotments in Bidara Cina

No	Status of Land Allotment	Total of area(ha)	%
1	Settlements	76,135	61 %
2	Public facilities	28,22	21 %
3	Offices	12,61	10 %
4	Market/Trade	6,61	6 %
5	Others	2,525	2 %
	Total	**126,10**	**100 %**

Source: Public Works Dept-Jakarta, 2011

3.1.1.3 Local Neighborhood Facilities

The facilities of local neighborhood of Bidara Cina that are spatially explained in this thesis: road infrastructure, sanitation infrastructure and settlement infrastructure.

Road infrastructure

According to Public Works Department of Jakarta (2011), the existing road facilities of Bidara Cina were being categorized as slightly damaged until severely damaged. This condition was due to the frequent inundation which may induce the damage of structure road. The worst condition remained to the riverbank area and community area which two of them were *RW* 05 and 07. The design of footpaths and neighborhood paths were commonly not compatible with quality and quantity of normative standards for good design.

Sanitation Infrastructure

Based on the assessment of sanitation infrastructures by Public Works Department of Jakarta, local government must concede that Bidara Cina experienced bad to worse condition after the presence of cramped areas which did not rely on normative standards of good design for drainage. Consequently, the drainage system could not hold the excessive water in rainy season which might have caused loss function of drainage structure in riverbank area, normally in *RW* 07, RW 05 and *RW* 14. Moreover, the media of human and household waste disposal has been in apprehensive condition. *RW* 05, 07 and 14 were three areas that still used temporary latrines which were built above the river and their community tended to behave ignorant for littering into river. Bidara Cina also encountered the problem of water consumption.

Settlement Infrasructure

Public Works Department of Jakarta (2011) delineated the state of settlement of Bidara Cina in two parts. The first was built in the decent state of building structures which was located along the main highway. The second was built in the poor to worse state of building structures which was located along the Ciliwung riverbank, most notably was the settlements that located within *RW* 05, 07 and 14.

3.1.1.4 State of Economy

According to Profil Data of Bidara Cina in the year of 2004 retrieved by Public Works Department of Jakarta, showed the source of livelihood was dominated by government employee. The rest of the community's livelihood in Bidara Cina can be seen in Table 3.3.

Table 3.3 Jobs and workers of Bidara Cina community
Year of 2004

No.	Jobs	Number of Workers (people)	Percentage (%)
1.	Government employee	4.267	38,52
2.	Private employee	3.800	34,31
3.	Military services	488	4,41
4.	Pension	425	3,84
5.	Small-scale trader	456	4,12
6.	Blue-collar worker	807	7,29
7.	Other service sectors	807	7,29
Total		**11.077**	**100,00**

Source: Public Works Dept-Jakarta, 2011

3.1.1.5 State of Social

Basically, the social structures of Bidara Cina community especially three *RWs* that included on the research have been categorized favorable for the improvement of community resources yet still needed to be empowered for quality as presented in the annual report of Public Work Department. Social facilities were sufficiently provided for their utilities, such as education facilities, health and sport facilities as well as liturgy and community institution.

According to Profile Data of Bidara Cina in 2004, Bidara Cina was inhabited by 43.318 people. Meanwhile, the total population of *RW* 05, 07 and 14 were noted as 9620 people. The distribution of population in *RW* 05, 07 and 14 is shown in Table 3.4.

Table 3.4 The Distribution of population in *RW* 05, 07 and 14

No	*RW*	Residents				Total	Total Area	Density (Person/Ha)
		Male	%	Female	%			
1	05	821	3,6	976	4,7	1797	5,9	0,305
2	07	2760	12,3	1760	8,5	4520	15,2	0,297
3	14	1621	7,2	1682	8,1	3303	0,2	16,515
Total		5202	23,1	4418	21,3	9620	21,3	17,117

Source: Public Works Dept-Jakarta, 2011

In comparison with two others *RW*, *RW* 14 was noted as the densely populated due to *RW* 14 has the smallest authority area yet inhabited by disproportioned number of residents.

3.2 Researcher's Situated Perspective

A situated perspective is established through the insight of specific community that live in riverbank area. It's based on the theory which was developed by Patricia A. Sullivan (1992, p.56) that "*the perspective from which the reality is glimpsed, is always a situated perspective*". Particularly, waste awareness and behavior were situated for investigating a farther waste practices within community. The researcher found that the practice of waste of each community basically depended on the role of each community leader. Even though, each of leaders encountered the problem of education level and the absence of waste infrastructures.

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3.3 Rationale for the Research Design

A qualitative approach was selected on this study to conduct the research in social science. The research stemmed from deciding explanatory case study as the nature of the research which aims for discovering some relationships among different aspects of the phenomenon under study (Barbie, 2001 cited in Ditsa, 2004, p.763). The paradigm of explanatory study also focused on gaining familiarity with the phenomena or to achieve new insight into it for developing the hypothesis (Julius et al, 2008). The analysis of correlation between waste

awareness and behavior is well-suited for the case study since this approach enables gathering data within the context being studied which usually involves direct observation and interviews (CAPAM, 2010). One study from Zainal (2007, 2 pp.) concluded case study is mostly used to employ small geographical area or a very limited number of individuals as the subjects of study. Moreover, Barbie (2001) suggested cross-sectional in terms of time dimension since the unit analysis is observed at only one point in time to analyze the result of correlation between waste awareness and behavior of riverbank community (cited in Ditsa, 2004, p.763)

3.4 Method

The method of research uses field research approach that was introduced by a leading expert, William Trochim (2006), that aims "*to observe phenomenon in its natural state or in situ which participant observation are taken into account and using extensive field notes*". During the observation, the researcher stood as the passive participation which means the researcher only performs as the spectator or bystander within the scope of activities which are being undertaken by primary participants (Key, 1997). This objective attempts to meet the single case study method as the ideal design to prompt inferences of a complex issue or object and empower the findings of previous research. The identification by Yin (1993) of some specific types of case studies is exploratory, explanatory, and descriptive (cited in Tellis, 1997). Accordingly, the study applied explanatory type as the analysis method for following rationales:

1. To draw the relevance of causal investigation research between waste awareness and behavior
2. To bring out the special interest of the waste practices of riverbank community.

3.4.1 Participant Selection and Introduction of Participants

Nine members of communities from three *RWs* (*RW* 05, 07 and 14) were informed by the researcher by attending the chairman of each observed *RW* and asked them to recommend people that could give participation toward the research. So that, the researcher intended to use the method of snowball sampling which means, "*to use existing participants or contacts to reach their social networks and refer the researcher to other potential participants. Snowball sampling helps to recruit "hidden populations" that may not be found from other methods of sampling".* [19]

Of the nine participants, three participants were the chairmen of each *RW* which were also found by the researcher as they might be the people who were being acclaimed for literally conceiving the circumstances of their communities. The rest of them were six people which three of them were the housewives of the chairmen, as they were often being as the paragon for other housewives within their respective community.

The remaining were one participant was a male as the head of youth organization in *RW* 07, one participant was a male who was in charge for the public relation of secretariat office in *RW* 14 and one participant was the housewife in *RW* 05 whose the house was precisely located at riverbank and actively collecting inorganic waste from Ciliwung river. Two experts were selected based on their capability in the realm of waste and riverbank community. One of them was a male as the head section of waste infrastructures of Cleaning Agency in Jakarta and another one was a male from Non Governmental Organization 'Jakarta Peduli' (Jakarta Cares). All the participants were recruited as they met the criteria. The criteria was that the participants of the riverbank community had to be over 18 , was permanent resident in Bidara Cina village, willing and able to give informed consent.

[19] http://www.uniteforsight.org/global-health-university/importance-of-quality-sample-size#_ftnref11 Last retrieved Feb 25, 2012

For the efficiency of this research, the researcher gave special parcel to each of *RW*'s chiefs that was researched. In the end, the random interest and sense of the heads of *RW* 05, 07 and 14 genuinely gave the benefit for the aim of the research.

3.4.2 Materials: Data Collection, Validity and Reliability

The selection of *RW* 05, 07 and 14 of Bidara Cina Village was due to the similarity challenges that have been perpetually faced by these three RWs based on the preceding research of Public Works Department of Jakarta. A case study database has been created through the length of research period.

Data Collection

The data collection was derived from principal sources of evidence, namely:

- Primary Data Collection: Questionnaire and Field Notes
- Secondary Data Collection: the data from Public Works Department of Jakarta and Cleaning Agency of Jakarta.

The study relied on a set of primary interview questions that led to the identification of the factors of waste awareness and behavior and the analysis of the correlation between them. The field notes assisted in pursuing every indigenous detail that might have been found during the research. According to O'Leary (2004, p.150), "*Collecting credible data is a tough task, and it is worth remembering that one method of data collection is not inherently better than another*". Certainly, the use of method data collection selected was adjusted to the goals of research and also to the benefits and difficulties attached to the method.

The stimuli was arranged as open-ended questionnaire which conducted in semi-structured interview (see Appendix 1) to investigate the causal links between waste awareness and waste behavior of community. In order to select the area of questions that were to be listed, de Vaus (2002, p.94) recommended five ways as follows:

1. Establish the concept of questions which are determined by the research questions.
2. Use indicators of concept for selecting the type of question.
3. Include the certain questions that propose the mechanism of variables linked or factors toward the relationship.
4. Predict the data for certain analysis to suggest information that are to be collected.
5. Choose the questions that suit properly the method.

The interview or questionnaire guidelines imposed the design of the semi-structured that ranged around a series of questions which the researcher aimed to ask within a period of 45-60 minutes per participant. Kajornboon (n.d) indicated that "*an interview guide is also an essential component for conducting interviews. An interview guide is the list of questions, topics, and issues that the researcher wants to cover during the interview*". Participant's response might be affected by the sequence of questions which were proposed by researcher. Therefore, the researcher concerned the composition of questions for avoiding the complexity and reluctance of the respondents. Researcher was obliged to convey a participant's informed consent to participant, which for this study in a way of oral consent that the study was voluntary and the rejection could be freely conveyed without any risk to participants. In the initial phase of interview, there was a concise time to explain the construct, procedure and aim of the research study by the researcher and to have feedback from participants. All of the participants received the identical set of open ended questions, allowing them to expand their responses as many as appropriate.

Generally, demographic variables were firstly proposed before socio-economic variables that related to waste awareness and behavior such as residence status, length of settlement, traveled-time of home-river and volume of generated waste as well. The questions were designed to encourage the interviewee to describe their progress and experiences of waste awareness and behavior.

These questions dealt with their knowledge for measuring their awareness and determining their attitude regarding waste behavior. These questions also emphasized on other activities that might have led to their awareness and behavior and their limitation to perform improved practices. In addition to this, the experts were asked about their involvement, experiences when handling the problems, track and any achievement by community, planning and recommendation.

Validity and Reliability

Based on the criterion of the study which attempted to generalize the themes of causation of the case, the researcher used external validity. National Center for Technology Innovation (n.d) illuminates "*External validity addresses how generalize the study's inferences are to general population".* The general measurement of validity and reliability was undertaken in order to refine the questions of interview; allowed an expert in the scope of research to check questionnaires guideline and a pilot testing was employed before actually collecting data from target of respondents. The susceptibility of questionnaire sentences was also tested. After correction of an expert and pilot testing, some questions were added, some eliminated and some reshaped. In addition, the examination of data credibility was employed through triangulation to ensure the quality of findings (Law et al, 1998, p.8). This study therefore applied data source triangulation.

3.4.3 Procedures: Data Coding and Analysis

The interview data were recorded using a tape recorder then each interview was saved to digital voice file format on the researcher's computer. Afterwards, the crucial task of transcribing interviews was manually undertaken which aimed to be continued with manual-coding and sorted the data to the category schemes.

Data coding and analysis emphasized in the way of segmenting data from data transcript which was attained from the text of interviews and field notes. Miles and Huberman (1994) coined two methods of creating codes; first, used by inductive researcher who may not want to pre-code any datum until she has collected it. The other is to create a provisional start list of codes prior to field work (cited in Basit, August 1, 2003, p.145). The researcher designed the categories based on the research questions which subsequent developed the codes to represent the key themes. Strauss and Corbin (1990) claimed "*category names can come from the pool of concepts that researchers already have from their disciplinary and professional reading, or borrowed from the technical literature, or are the words and phrases used by informants themselves"*(cited in Basit, August 1, 2003, p.144*)*. Hence, the researcher preferred to apply prior codes[20] through the approach in which the data fits or does not fit the categories by using descriptive words in flat and non-hierarchical structures. Five categories were identified to assign the coding are:

1. Concern over waste awareness
2. Preferred method for waste disposal
3. Common waste problems
4. Method of waste practices
5. Response to items on practices

Thereafter, commonalities within the stories of interviewees were withdrawn if there at least two shared experiences by communities. Data analysis has begun concurrently with data collection, as it was casually started within the interview, then continued during transcription and was perfectly generated when iterating categories, codes and themes.

[20]When dealing with *a priori* coding, the categories are established prior to the analysis based upon some theory. Professional colleagues agree on the categories, and the coding is applied to the data. Revisions are made as necessary, and the categories are tightened up to the point that maximizes mutual exclusivity and exhaustiveness (Weber, 1990 cited in Stemler, 2001)

The researcher used explanatory building as the relevant method to analyze explanatory case study which aimed for exploring the causation factors that underlying riverbank community action of their waste management practice with respect to waste awareness and behavior. Stake (1995) stated "*explanation building is the analysis type of the case that carried out by building an explanation of the case"*(cited in Klenke, 2008, p.67).

3.5 Ethical Considerations

In establishing this study, there were a number of ethical considerations. The principal was the need to guarantee the member of communities who contributed data to this study did so willingly and without coercion, and that they would remain anonymous in the study. All members whose responses contributed to this study were informed about the general parameters of the research and willingly gave their permission early in the research design process.

As the data collection process was undertaken within a limited period, permission was confirmed by all participants at the introduction of the study which was approximately done at three until seven days before the interview was conducted.

After the completion of the data collection process and preliminary analyses, a casual meeting with the participants provided an opportunity to share their opinions and experiences regarding the issue of research. Their response continued to be one of the interests and enthusiastic supports for the study. All data were numerically coded immediately upon data collection so that individual participants were not identifiable by name. The approach for the analyses of their answers of questionnaire was not a judgmental one, based on each member of community's situation and capability respectively. In line with explanatory method as the focus of this study, the responses were investigated as the reflection of perceived characteristic of each community and their neighborhood.

Moreover, the supporting data in the study were retrieved from published research sources from public domain.

3.6 Summary

This chapter emphasized case study method as the nature approach for analyzing the study. The information of data collection and data analysis process were also established in this Chapter Three. Data collection relied on semi-structured interview. The researcher commenced data analysis from recorded data, transformed into manual data transcript then making the categories based on prior codes. Finally, this chapter discussed the suitability of the research design, the participants, validity and reliability, and ethical considerations. The following chapter presents the results for this study, where they will be examined and assessed.

CHAPTER 4: DATA ANALYSIS AND FINDINGS

This chapter discusses the data analysis and findings of the study. The data were collected and then processed to answer the research questions created in Chapter One of this thesis. Four fundamental goals are to provide an overview of the current existing of household waste management, to find out the factors that influence waste awareness and behavior and to analyze the correlation between waste awareness and behavior, as well as to provide recommendation for the stakeholders. The findings presented in this chapter are themes, categories, and subcategories, supplemented by literature control to verify the results.

4.1 Data Analysis

Unit of analysis of this research is being categorized as aggregates which refer to community associations (*RW*) which may consist of 5-10 neighborhood associations (*RT*). Interview was conducted in semi-structured for assigning the use of open-ended questionnaire.

A total of nine members of community and two experts from related institution and organization accomplished the interviews which were undertaken from December 15, 2011 until January 05, 2012. The responses (data) were subsequently translated into English before being analyzed. During the data analysis, the researcher read all the field notes and listened to the tape recordings. The researcher then transferred the responses into narrative forms by transcribing them and developing the code. Coding was previously done through the use of descriptive words for categories which based on the research questions in the initial step of constructing the questionnaire. Accordingly, the researcher reorganized the questions in order to develop the answers that being relevant categories (Dey, 1993, p.105-106). The presentation of the results of data analysis in this thesis employed explanation building technique through following steps (Yin, 2008, p.141):

- Stipulate presumed set of causal links of phenomenon about how or why something happened
- Occurred in narrative form in sequential order or chronology.

4.2 Data Structure

The findings from data were assigned from the sections of questionnaire which divided into three major points as following:

- Respondent Identity
- Waste Awareness
- Waste Behavior

According to prior codes, the researcher classified data into five categories which eventually developed two key themes, the first was to evaluate the level of awareness of community, and the second was to explore the pattern and motivation of waste behavior of community. The overview of the themes and categories can be seen in Table 4.1. In addition, the author applied the causal links to commence the analysis namely: *how their waste awareness affects their behavior and why community commits to waste littering into river.* The initial proposition was assigned to imply the causal links: *Waste awareness has stronger tendency to increase desired waste behavior than any other variable*.

4.3 Respondent Identity

This section of questionnaire covered the respondents' age, gender, address, occupation, household monthly income, last education, residence status, length of settle, traveled-time of home-river, volume of waste generated. These personal data gave the profile view of respondents and their neighborhood which were useful for visualizing the causal links

between waste awareness and behavior. The results of demographic and socio economic variables are shown in Table 4.2.

Table 4.1 Data structure

Data Presented	Themes and Categories	Descriptive title
4.1	Theme 1	Perception of waste awareness
4.1.1	Category 1.1	Concern over waste awareness
4.1.2	Category 1.2	Preferred method for waste disposal
4.1.3	Category 1.3	Common waste problems
4.2	Theme 2	Performance of waste behavior
4.2.1	Category 2.1	Method of waste practices
4.2.2	Category 2.2	Response to items on practices

Source: Author, 2012

Table 4.2 Demographic and socio-economic variables of respondents

Factors / **Respondents**		*Age (Year)*	*Gender*	*Occ.*	*Income (Rp)*	*Education*	*Res. Status*	*Length of stay (Year)*	*Home-river (Minute)*
A	*RW* 14	55	Male	Gov.Emp	2,5 mio	Bachelor	Private (inherited)	54	8
B	*RW* 14	38	Male	Self.Emp	1,5 mio	Senior High Sch.	Private	20	5
C	*RW* 14	50	Female	Hs. Wife	2,5 mio	Senior High Sch	Private	30	7
D	*RW* 07	50	Male	Self Emp	2 mio	Senior High Sch	Private	28	5
E	*RW* 07	49	Female	Hs. Wife	2 mio	Senior High Sch	Private	28	5
F	*RW* 07	28	Male	Priv. Emp	1,5 mio	Bachelor	Room tenant	5	5
G	*RW* 05	35	Male	Priv. Emp	1,5 mio	Senior High Sch	Private	10	3
H	*RW* 05	30	Female	Hs. Wife	900.000	Senior High Sch	Private	10	3
I	*RW* 05	40	Female	Hs. Wife	900.000	Senior High Sch	Private	15	1

Source: Author, 2011
Description:
Occ. (Occupation);Gov.Emp (Government Employee); Self. Emp (Self Employee); Hs. Wife (Housewife); Priv Emp. (Private Employee);Senior High Sch. (Senior High School); Res.Status (Residence Status)

4.3.1 Respondents age

Respondents were asked how old they were when being interviewed based on their respective year of birth. The respondents were purposefully chosen as they belonged to reproductive ages of Indonesian citizen, which are between 18 years old and 55 years old (Sutandy, 2008). The oldest respondent was 55 years old and the youngest one was 28 years old. The limitation of ages due to the respective potential of active participation toward waste practices. Based on the field research, age can be drawn as the factor that influenced the type of activities of waste management. The author found that respondents in young age focused more on how to change the value of waste into benefit matters of either personal or communal profit. Rather, older people only focused on traditional and simply method, such as collecting the waste to the provided communal disposal places then transported to final disposal by cart workers. For this circumstance, the workshop of simple reduce, reuse and recycle should be frequently conducted by young people for motivating older community develops their method.

4.3.2 Gender

The type of gender was not precisely required during the interview. However, four female respondents and five male respondents participated in this study. Most of female respondents were chosen where their position played influencing role for other housewives and they usually did the household tasks including waste collection. Meanwhile, male respondents were chosen as their role in community's organization often driving people. Gender indicated different areas of collecting waste for male and female respondents. Male tended to handle wastes that were generated by other sectors and collected the waste from their vicinity, yet female tended to being more responsible for dealing with household waste generation and storage. Practically, the community still encountered the problem of waste facilities. In this case, the creativity of male respondents was used to overcome the obstacles by using used

materials around their neighborhood to build some waste equipment. This conformed to the issue in Chapter Two that the slum dwellers have to get accustomed to the state of limitation where several or all of basic municipal services and social access are omitted.[6]

4.3.3 Types of Occupation

Types of occupation of respondents were diverse, for instance government and private employee, self-employed and housewife as well. The involvement of each respondent toward waste was not essentially related with their occupation. A housewife was likely to be the person who was more frequently exposed to waste; however a private employee might be the one who put more concern for waste practice than anyone else within community. This concluded that everyone was able to participate for waste practice as long as they were being aware of making some concern and providing time for dealing with waste.

4.3.4 Household Monthly Income

Nine respondents which were interviewed had average amount of minimum wage. It revealed that they belonged to the low-income groups as it was the focus of a study by Bird and Manning (2005, p.3-4), "*a breadwinner earning the Jakarta minimum wage of US$80 per month alone (around $250 in PPP terms) is obviously not sufficient to support an average Indonesian household of four persons above the lowest, standard, international poverty line of $1 a day, let alone the slightly higher $2 a day".* This factor therefore stimulated certain respondents who earned exactly minimum wage to get alternatively revenue side by collecting and selling wastes. However, other respondents who earned income slightly more amount than minimum wage seemed to have less initiative to take the benefit of waste. Figure 4.1 shows waste was steadily collected to be trade-commodity in free market system. Pictures

were taken by author with the setting was in the waste separation posts built by *RW* 05 community in Ciliwung riverbank.

Figure 4.1 Waste collection post and ready to sell used-plastic cups
Source: Author, 2011

4.3.5 Educational Status

During the interview, the researcher only found two of nine respondents who graduated from college. The rest of respondents acquired the form of senior high school. The level of education determined their level of awareness of waste but not casually determined their waste behavior. Through the self-experience obtained by Barley (2011) as stated on Jakarta Globe, "*it's confusing that people in Jakarta aren't civilized when it comes to keeping the capital clean. What's interesting is this behavior transcends all demographic groups. The poor and the uneducated do it, but the rich and the educated do it too.*"[21]

[21]Barley, Tasa Nugrazaon blog. Last retrieved March 20, 2012 from http://www.thejakartaglobe.com/jakartajungle/the-bitter-truth-littering-is-a-jakarta-epidemic/460393

4.3.6 Residence Status

The role of residence status was to assign the respondents' willingness to participate in waste management practice. Eight respondents admitted as the owner of the house and one of them was a private room-tenant. The author found residence status had not immediate impact on their waste awareness and behavior. Since respondents' houses were vulnerably located in riverbank area, littering into river action was gradually reduced in order to prevent the impact of annual flood. As stated in review literature, Fry et al, (2002) continued, one characteristic of developing cities in the world regarding the waste is around 20% to 50% of all solid waste left over from waste collection. This matter obviously appears in informal settlements where the physic features of the street is too narrow, more likely to be alley, on steep hillsides, thus the truck is not able to pass as shown in Figure 4.2. Garbage becomes a commonplace for children, scavengers, and health hazard source at once (p.39).

Figure 4.2 Residences in Bidara Cina
Source: Author, 2011

4.3.7 Length of Settlement Period

Among respondents from *RW* 05, 07 and 14, the longest settled period of time was 54 years which was possessed by one respondent who had been being the second generation since the house was inherited by the parents. Meanwhile, the shortest settled period of time was 5 years possessed by one person who moved to Jakarta after getting a job vacancy and settled as the room-tenant. The findings indicated that the length of settlement factor had not reliable effect toward waste participation. The lengthy resident seemed to have more orientation for waste collection and separation rather than the new resident who was more involved in waste recycling.

4.3.8 Traveled-Time of Home-River

In general, houses in Ciliwung riverbank were built closely adjacent to each other. The concept of river as back yard was salient in Bidara Cina vicinity. All respondents stated that they lived in locations which only needed one until eight minutes to reach the river. Community who lived just exactly in riverbank was the immigrants who infringed the demarcation line of river and built the houses. Indonesian Government had declared the enactment of Government Regulations No.35 Year 1991[22] about the permission to establish, alter or dismantle buildings within or across the river was only given by the competent authority.

4.3.9 Volume of Waste Generated

According to the field research, respondents used plastic bags to store their household waste which was then collected to the communal disposal or counted on the cart service worker. The volume of respondents' household waste in Bidara Cina ranged between 0,008 and 0,020 m^3/day, while the frequency of discarding household waste was varied from 1 time/day to 2

times/day following the time-table of truck vehicle schedule. There were two general characteristics household wastes produced by household community, namely:

- Organic waste, such as kitchen wastes; leftover vegetables and food
- Inorganic waste, such as plastic, styrene foam materials and used-bottles and cans.

One respondent committed a littering offence into Ciliwung river. The action was due to the stench nature of organic waste and the distance of home-river was nearer than home-waste communal disposal. To address such this tendency, Jakarta Environmental Management Agency are about to launch the latest campaign, "My River, My Front Yard", which aims to appeal communities to put efforts together for restoring river's function[23].

4.3.10 Summary of Respondent Identity

The results of respondent identity specified demographic and socio-economic variables. Demographic variables consisted of age, gender, education level, household income and types of occupation, while socio-economic factors explained residence status, length of settlement period, traveled-time of home-river and volume of waste generated. In conclusion, demographic and socio-economic variables both revealed following results:

1. Age: the oldest respondent was 55 years old and the youngest was 28 years old. The age differences between old and young delineated equal awareness however different in purpose of waste behavior.
2. Gender: four female respondents and five male respondents participated in this study. Gender indicated equal awareness yet different in scope of the activities and areas of waste behavior.

[22]http://www.pu.go.id/satminkal/itjen/hukum/a/pp35-91.pdf Last retrieved March 23, 2012
[23]http://www.thejakartapost.com/news/2011/05/14/jakarta-rivers-still-filthy.html Last retrieved March 25, 2012

3. Types of occupation: four respondents were housewives, two respondents were private employees, two other respondents were self-employed and one respondent was government employee. In this study, types of occupation perceived less influence toward waste awareness and behavior.
4. Household monthly income: Four respondents earned slightly more amount than minimum wage (2.000.000-2.500.000 Rupiah) and five respondents earned minimum wage (900.000-1.500.000 Rupiah). They were classified as low income group. Low monthly income prompted their level waste awareness and behavior.
5. Educational status: Seven respondents obtained form of senior high school and two of them acquired college education. Educational status determined their awareness however behavior depended on the willingness of each respondent.
6. Residence status: Eight respondents owned their house and one respondent was a private room-tenant. Residence status implied less significant influence toward waste awareness and behavior.
7. Length of settlement period: The longest respondents' settlement period was 54 years and the shortest was 5 years. The period factor did not create reliable results toward waste awareness and behavior.
8. Traveled-time of home-river: The shortest time was one minute and the longest time was eight minutes to reach the river. The distance between home and river perceived different behaviors amongst respondents although waste awareness was identical amongst them.
9. Volume of waste generated: The production of waste was between 0,008 – 0,020 m^3/day. The volume of waste influenced participants to build concordant awareness and behavior.

4.4 Presentation of Themes and Categories

4.4.1 Theme 1: Perception of Waste Awareness

The first major theme that was previously determined to data collection was perception of waste awareness. Three categories were previously created to represent this key theme, as follows:

1.1 Concern over waste awareness

1.2 Preferred method for waste disposal

1.3 Common waste problems

4.4.1.1 *Category 1.1 Concern over waste awareness*

Some of the respondents expressed their perception of waste awareness through opinions and expression toward the concern of waste in their neighborhood. Most of the concerns of respondents were strongly linked in some responses of specific questions, such as:

- What is your concern for refuse around your neighborhood?
- How do you regard the refuse with flooding around your neighborhood?

Questions	Data Presented 4.1.1 Concern over waste awareness
What is your concern for refuse around your neighborhood?	• The need of waste facilities, for example waste bins • The familiarization for strict prohibition of waste littering into river • Community needed to be encouraged to personally treat their wastes • Establish an organized-management for waste collection • Arrange a community service to handle wastes
How do you regard the refuse with flooding around your neighborhood?	• The source of wastes in river which caused flood was not created by Bidara Cina community • The generation of waste in river was due to activities from commercial sector near Bidara Cina (central traditional market) • Home-debris were ignorantly thrown into river, causing river siltation and flooding • Minor flooding gave benefit for community based recycling • Major flooding created a new source of waste

From the first category, the concerns of refuse were perceived from situation that occurred in their neighborhood. Each respondent, especially the heads of *RW* reflected observational perceptions where the concerns were provoked as though the lack of waste awareness has been relatively related with the absence of waste facilities and waste management.

Regarding community's perspective that considered waste responsibility should be largely carried by government, *BAPPENAS* on Sustaining Partnership (Nov, 2011, p.4) shared government' initiative to regulate waste management through Law No. 18/2008. The Law states that "*waste management is not only the duty of government but the society and businesses that produce waste are also responsible for creating a clean and healthy environment"*. Thus, the government had a legitimate derived from Law No. 18/2008 to share the task of waste management planning that was attached to each region, province or municipal agencies.

This government measure had been justified by one informant as follows:

> *"The government had sent the appeal for community to not littering the brick for building or debris, but the community still did not care……until two years ago, the local authority put a banner which contained Local Regulation of Year 2007…. this provoked community to finally throw their waste to trash bins."*

From the review of related literature, the correlation between community awareness and their willingness to cooperate and participate can be seen in adequate waste management practices. If good waste awareness is embedded through people, it will affect the population's willingness to create participation, for example, carrying waste to a shared container, segregating waste to assist recycling activities, or paying for waste management services without any pressure (Zurbrügg, 2003 Feb, p.8).

This theory constitutes support for the initial proposition that waste awareness has stronger tendency to increase community desired waste behavior as it states the good waste awareness,

like the result of dissemination of local regulation has significant tendency to increase desired waste behavior. However, one respondent shared the truth situation of community:

> *"The community is still unaware of reuse, reduce and recycle process. Education background influences waste awareness and behavior of community….however, people who have good education…but they don't have energy or intention, and in the end it results nothing."*

Through this evidence, it disproves the provisional theory as waste awareness is not casually related to waste behavior, yet waste awareness has causal tendency to increase desired waste behavior through other variable like motivation. Therefore, waste awareness has significant causal tendency to conditionally increase desired waste behavior if other variable appears as belief variable.

4.4.1.2 *Category 1.2 Preferred method for waste disposal*

The perception of waste awareness of community was assuredly implied into waste disposal method. They were asked to consider the option method from the list (Appendix 1). For instance, two questions revealed the evidence of community tendencies, namely:

- Which of these methods of waste disposal that you like to be put into use in your neighborhood?
- Why do you prefer one of these methods to be put into use in your neighborhood?

Questions	**Data Presented 4.1.2** **Preferred method for waste disposal**
Which of these methods of waste disposal that you like to be put into use in your neighborhood?	• Recycling, community owned more interest of inorganic waste than organic waste • Recycling and burying. Community still buried their inorganic wastes at backyard and run recycling at once • Composting and recycling. The products may be sold in waste bank

Questions	Data Presented 4.1.2 Preferred method for waste disposal
Why do you prefer one of these methods to be put into use in your neighborhood?	• Establish environmental-friendly *RW* • Encourage community to embrace waste recycling and composting • The benefit from recycling products may cover personal monthly cost • Burying inorganic wastes was assumed to prevent mosquito breeding (*Aedes aegypti*)

In addition to the perception of waste awareness, community emphasized the preferred methods that eventually created the benefit for them like recycling. Meanwhile, the rationale of methods was oriented either toward the importance of community or personal.

One of reasons of selecting waste disposal methods as confirmed by one respondent:

> *"Every day, waste is collected by cart worker. If we find debris trash, it will be used for paving the road….when waste is found near the riverbank, it will be usually burnt…..actually, we think of making the natural fertilizer from it, but we still encounter the low resources of raw materials."*

In addition, other respondent argued:

> *"Due to the limitedness of activities fund, the activities like waste training is not possible to happen…moreover it is not possible either to provide waste bins. It therefore decreases the initiative to separate waste."*

From these evidences, the previous provisional theory is confirmed that waste awareness has significant causal tendency to conditionally increase desired waste behavior if other variable appears as belief variable like motivation. In this case, incentives may stimulate the motivation of community to create some waste behavior. Thus, waste awareness has more significant causal tendencies to conditionally increase desired waste behavior if one variable appears to support other variables like incentives support motivation and waste awareness.

According to the literature in Chapter Two, there are four approaches to increase community participation, such as leading discussion, inclusive shared forum, and waste problem

revelation as well as affection process (Shukor, 2011, p. 969). Bidara Cina community generally practiced the system of Collect-Transport-Dispose, as one respondent explained:

"We store our household wastes using plastic bag….when it is full we put it near our fence respectively, then it will be collected by the cart workers, they transport it."

Reviewed from Chapter Two, Yogyakarta, one of the largest cities in Indonesia through the action of municipal governments, has introduced and promoted the concept of organized citizen participation and involvement in primary collection plan. By using handcarts for house to house collection which are managed by the community or neighborhood units, thus, it has contributed an important movement in the city's solid waste management system[10].

4.4.1.3 *Category 1.3 Common waste problems*

Perception of waste awareness assessed the ability of community to identify waste problems around their neighborhood. Community waste awareness relating to waste problem was clearly contained in two following questions, namely:

- What kind of waste problems that you usually find in your neighborhood?
- How do you react when you find the waste problem around your neighborhood?

Questions	**Data Presented 4.1.3** **Common waste problems**
What kind of waste problems that you usually find in your neighborhood?	• Children had low waste awareness. They tended to waste littering in the street. • Community tended to dump their wastes when rainy season instead of throwing to waste bins. • The scarcity of waste bins • Expensive charge for waste disposal facilities for felling trees and house debris • Lack of assistance for handling wastes after flooding
How do you react when you find waste problem around your neighborhood?	• Develop creativity to make self-made waste bin from usable stuffs around neighborhood • Apply discipline from home to community to keep neighborhood clean. • Set the coordination amongst *RTs* for handling wastes after flooding

Waste problem that occurred within community's neighborhood involved several aspects of causal links, like the actors, circumstances and mismanagement. The awareness was expected to present for developing organization skill and creativity to handle waste problem without counting on the government's effort to the utmost for responding the problem.

One respondent argued for the effort to maintain clean and healthy neighborhood:

> *"Actually, the problem is never too serious since the waste collection runs every day…yet the difficult thing is to tell people to not litter, for example: children litter in the street. We sweep the street of our neighborhood every morning, but it seems useless towards evening because of the children and a few people. The head of RW wants to reprove, however…without solution, it is fictitious measurement."*

Other respondent remarked waste problem occurred in other *RW*:

> *"The problem of trash debris becomes the distinctive problem of waste source in river. Local authority has urged people to not throw their debris into river. To watch how many people throw their debris…it is difficult to control for 24 hours, thus the co-operation amongst neighborhood organizers is needed."*

Moreover, other respondent shared the complaint of waste services by local authority:

> *"The authority of under sub-district (Kelurahan) only pays attention to the cleanliness of main vicinity, like main curbside."*

As related to Chapter Two, people tend to create their awareness when they are being concerned over their responsibility and play their part in maintaining hygiene and health. However, a clear explanation about their role and responsibility are substantially needed by community and surely provided by local authorities. Hence, community knows the limitation of local authority services, so that, community is able to be a sub-agent of local authorities to cope continually with waste management problem (Zurbrugg and Rehan Ahmed, 1999, cited in Shukor, 2011, p. 971).

In addition, the presence of the head of *RW* was required to organize the participation. The interest and sense of each head of *RW* influenced the range of community participation as discovered in the consequent findings:

RW 05

The author found that most of these low income people in *RW* 05 were further encouraged by the head of *RW* 05 to operate waste separation which was proven with the presence of three waste separation posts in riverbank. Even though, a conflict once happened between the post organizers and civil service administrator due to the posts were closely erected in riverbank, therefore, violated the law. Along with the time, the presence of separation posts in *RW* 05 was accepted by local authorities and becoming the representation of Bidara Cina waste management practice. During the research, the organization was about to plan a waste campaign for community.

RW 07

RW 07 is part of Bidara Cina which was frequently inundated when rainy season comes. Hence, waste awareness and behavior of community were practically related to flood event. The community showed more tendencies on avoiding waste problem like burying their wastes in their backyards in order to keep the vicinity free from Aedes aegypty as the agent of scarlet fever.

This measurement had been promoted by the head of *RW* 07 who also initiated "*kerja bakti*"[24], the single term of spontaneous work established by all members of community, especially for cleaning the vicinity of house and neighborhood. They established this form of communal work routinely every once per three months in order to encounter the impact of rainy season. However, the flood event had ruined community's motivation to take the advantage of composting facilities which had been provided by local authorities, and added by the absence of encouragement appeal from the head of *RW* 07 to establish either composting or waste

separation action, thus the waste management practice of *RW* 07 had congested and stood with traditional practices along the time.

RW 14

During the year of 1992, *RW* 14 Bidara Cina was selected as the area for greening and cleaning movement project by federal and provincial government agencies which aimed for encouraging community to cultivate plants or small gardens in their yards. Alas, the project was only noted as transferable model than a successful example of innovation (Chen Lo and Yeung, 1998, p.261-263). Nowadays, the concern of the head of *RW* 14 basically emphasized on the demand of waste facilities, particularly the procurement of waste bins. The head of *RW* 14 did not indicate any composting and separation actions within community. The secretariat member of *RW* 14 also added the importance of waste bank and frequent waste counseling to encourage community initiation to participate in waste activities since the head of *RW* 14 experienced the lack of response to persuade community due to the absence of waste facilities.

[24]According to Pratono and Suwarso, (n.d), *the citizens conduct a communal work of cleaning the vicinity of their house and environment. This spontaneous work is called "kerja bakti". Kerja means work, whereas bakti means devotion. They do it in a "gotong royong" way, which means work hand in hand with each other to dress up their kampong, clean up the disposal of waste water, and for rapid run-off of rainwater.*

4.4.2 Theme 2: Performance of waste behavior

The second theme that was derived before data collection was to assess the performance of waste behavior of community. Data presented 4.2 summarizes the categories in this theme, namely:

2.1 Method of waste practices

2.2 Response to items on practices

4.4.2.1 *Category 2.1 Method of waste practices*

The essential questions of interview that covered the investigation of waste practice methods used by community are:

- What is your currently disposal method?
- What do you need to facilitate or change your currently disposal method?

Questions	Data Presented 4.2.1 Method of waste practices
What is your currently disposal method?	• Collect-Transport-Dispose (majority) • Collect to Depot Transfer • Burying in backyard (minority) • Throwing into river (last option)
What do you need to facilitate or change your currently disposal method?	• Automatic and manual waste bins supplied by local authority • Waste recycling equipments supplied by local authority • Composting equipments and training support for retired residents.

When asked about their currently disposal method relating to waste practice, most of respondents generally answered Collect-Transport-Dispose system, while the rest added collect and dispose to depot transfer system since the cart worker did not operate in their area. Specifically, two respondents admitted that they used alternative methods, for example burying in home backyard and littering into river to overcome stench problems, as follows:

> *"I use the Collect-Transport-Dispose system. Sometimes, I bury the wastes in my backyard if there is stench of waste generated at my home."*

Meanwhile, another respondent added:

> *"We value our waste which is made such as from plastic, we collect it and sell it. It gives us the benefit of money. However, the stench waste like fish scale annoys us and it is impossible to be held at home, so we throw it into river because we think it is not a big matter."*

According to their statement, community's disposal method has the opportunity to be improved. Retired residents may invest their unoccupied time for getting more involved in composting activities. In addition, one respondent interjected that the replenishment of waste bins may reduce the amount of littering wastes into river.

These two evidences show that respondent might have good waste awareness yet also had undesired waste behavior at the same time; therefore, it refutes the first proposition that waste awareness has stronger tendency to increase desired waste behavior than any other variable, yet support the previous theory, as in this case, the economic value of waste was likely to control community's waste behavior. The fifth provisional theory therefore resulted from this fourth iteration, concluded that waste awareness has most significant causal tendencies to conditionally increase desired waste behavior if one variable appears to control the result of other variables, as in this study, economic value of waste appears to control the result of motivation, incentives and waste awareness.

Reviewed literature found community's behavior is attached to new ones through the successful adaptation of intensive, long-term, and creative social marketing. To get people automatically generate less waste, options are always available for community to choose which method they are fond of each offered proper waste treatment, for instance reusing materials, altering consumer behavior, or composting food and yard waste[12].

4.4.2.2 *Category 2.2 Response to items on practices*

There are always pattern and motivation behind their behavior relating to waste practice. Several questions were established to show the responses, as following:

- What is your consideration for reuse or recycle something instead of throwing it away?
- What is your expectation for waste practices and management in your neighborhood?

Questions	**Data Presented 4.2.2** **Response to items on practices**
What is your consideration for reuse or recycle something instead of throwing it away?	• To develop waste activities within community • Lack of responses from community to do recycling • Lack of recycling facilities to encourage community
What is your expectation for waste practices and management in your neighborhood?	• Waste education of recycling, reuse and composting in periodic frequency • Local authorities give more attention to local waste organization • Local authorities may interact more with community

In order to specify the behavior of community, they were interviewed for the possibility practicing reuse and recycle in their neighborhood. Respondents claimed it was getting more difficult since only few members of community were willing to establish recycling activities. Most of community was reluctant to participate as recycling and reuse activities need a long process to obtain the result. According to Post (2007) as has been stated in section 2.4.1, the important task of having an effect on behavioral change is to figure out which influencing factors that encourage each individual to change the behavior of waste management (p.20).

One respondent concluded the experience of recycling event:

> *"Reuse, reduce and recycle event will be approved by the chief of RW if it will be encouraged again within community. However, community in this RW has less intention toward waste recycled because they think it requires long process*."

In addition, respondents were requested to share their expectation for improving waste behavior.

The essential measurement regarding the improvement of their waste practice and management were to periodically educate community therefore they would be able to maintain their behavior and to capture local authorities' attention for ensuring their assistance. Regarding with community initiative for educating their member, one respondent disclosed:

> *"Sanggar Ikhlas (the name of waste community organization) is identified as the icon of Bidara Cina. The first post was built three years ago and full infrastructure was established in 2010. From this particular organization, we run waste separation for almost 50% for this RW. Sanggar Ikhlas is now about to establish an event related with waste treatment in April 2012. The main purpose of this event is environment initial education for children."*

4.5 The Examination of Data Credibility

The study applied data sources triangulation for the examination of data credibility. Data sources triangulation was employed with the perception and viewpoint of expert respondents. Two experts were interviewed related with their profession and experiences of dealing with wastes. The first one was a sub-division chief of Cleaning Agency of Jakarta and the other one was a member of Non-Governmental Organization (NGO) Jakarta Peduli (Jakarta Cares)

4.5.1 The Cleaning Agency of Jakarta Province

The Cleaning Agency is responsible for establishing city sanitation plan within Jakarta Province[25]. The expert interviewed from this agency was recommended by the administrative subdivision of the agency as this person who was responsible for data required of the research. Waste awareness and waste behavior were the specific weight points assigned to the interview.

[25] http://www.jakarta.go.id/jakv1/perangkat_daerah/tupoksi/71 Last retrieved March 31, 2012

4.5.2 Jakarta Peduli (Jakarta Cares)

From the perception of author, Jakarta Peduli is a Non-Governmental Organization that pursues social aims; they especially work for communities in Jakarta. However it does not limit their operation from social problems in other cities. The interviewee was obtained as the recommendation from one of the heads of *RW*. The responses obtained from the respondent were used for validating the perception and view points between community and Cleaning Agency of Jakarta Province.

4.5.3 Data Sources Triangulation

The interview covered 15 questions which were used for sharing the perception of waste awareness then the responses were used for assessing Bidara Cina community's waste awareness and behavior from the perspective of civil servant and NGO member.

According to the field research of three *RW*s in Bidara Cina, one prominent issue that came to the surface was the demand of communal trash bins. Community perceived the replenishment of trash bin as the vital tool for enhancing their awareness and behavior. One respondent reflected this issue as was asked about the most actual problem:

> *"We need more trash bins in each residential point. Actually, we already have a few trash bins yet it is less than we need. "*

When the expert of Cleaning Agency was asked to respond the issue of waste facilities and how community threw away their refuse, Cleaning Agency (CA) answered:

> *"Community relies on the system of collect-transport-dispose. Yet, only around 40% of community runs this system. Sometimes, one temporary final transfer serves three RWs. According to Local Regulation No.5 Year 1988 stated "community should provide themselves a trash bin". Bidara Cina has only one Temporary Final Disposal and two*

containers. The cart man is recruited from community, but the cart is provided by Cleaning Agency. The infrastructure is considered quite enough."

Meanwhile, Jakarta Peduli (JP) had different perception:

"The task of local authority is to provide facilities for community. When it comes to community, their answer is no facility is provided. When the problem is attached to beyond river, only one local authority is involved, such as Cleaning Agency but when the problem is attached to the river (Ciliwung), several local authorities are involved."

Community was also being concerned to the problem of waste littering into river and its relation with flooding. One respondent depicted the real situation:

"Minor flooding gives us advantages, because the recycle or reused waste will flow with the stream of Ciliwung River, so we collect then sell them, while major flooding gives us no choice but to flee to other safe places."

Other respondent shared the experience:

"I never commit littering into river because it harms environment and the river is a bit away from my home. Unfortunately, people who live just by the river, still commit littering into river, because they are unwilling to go a bit far to throw their waste to trash bin, so they throw into the river."

Regarding this issue of littering into river and flooding, CA implied:

"I will say five points from one to tenth for the response from community toward the implementation of waste management. The waste awareness of community is influenced by factor of education, rather than economic factor.

Littering causes non-functional drainage, the waste therefore piles which leads to flooding. If the paradigm is changed to see river as the front yard, it may change the community's perspective. There is no firm regulation that prohibits the waste littering

into river. In further time, a new regulation will be arranged for governing the prohibition of littering into river."

For this circumstance, JP answered:

"First, we assume that community has to throw their wastes to trash bins, yet there is no trash bin provided and they cannot stand for the waste stench, so that they throw into river.",

"There was a community that claimed themselves as the cleanest place. When they were asked whether they have waste treatment, yes, they had the self-help clean worker; the fact was they still throw their wastes into river. People don't seem to care about their waste even though they already know the impact. They are mostly not the local residents. Nonetheless, the local residents may care but they don't have access for waste management."

Some trash bins and trash disposal points in *RW* 05 Bidara Cina as shown in Picture 4.3

Figure 4.3 Self-made waste trash bins in RW 05 Bidara Cina
Source: Author, 2011

An integrated solid waste management should include the participation of community toward related activities of waste hierarchy, such as Reduce, Reuse, Recycling (3Rs) and composting as well. Based on the findings of this research, community participation toward these

activities was influenced by several factors, mainly were the role of local leader and government's approach.

In order to encourage community for being active in waste hierarchy activities, three respondents remarked several points as the pros and cons of the issue:

- *"Bidara Cina has not received ration for being facilitated by government to found waste bank as several sub-districts has received it. The establishment of waste bank will be appreciated by community."*
- *"All members of community must be responsible for waste activities, yet we still need the role of chief in charge of the activities. If the programs of reuse-reduce-recycle and composting have to be applied, we are stuck on the problems of human resources and socialization."*
- *"It won't be effective to establish composting program since community never put their interest for it because of long process."*

CA indicated the answer about the measurement to increase 3Rs and composting activities within community:

> *"The local authority thinks community is not too being active for composting program. It might because they have to wait and it gives the problem during the process, like the stench… Community participation is very limited. Sub-district and under sub-district agencies ignores responsibility to improve it. At least, community is expected for not littering into river. However, Cleaning Agency still send the representatives from the community counseling sub-division that carry on the task of delivering the target candidates and establishes the group of community…waste facilities, such as trash bins will be given for free, they just need to being active for joining the counseling or training.",*

"The concern of community toward recycle is appraised little because they are reluctant to be involved in long and complicated process of recycling. If any financial body is willing to being involved as the marketing medium, thus it will create the intention of recycle within community."

Meanwhile, JP observed different perspective towards community participation:

"Community has actually been aware with reduce-reuse-recycle and composting. People who have high awareness and economic level may not participate, but middle to low income group is the people who want to participate. The ability to get the access and change the awareness into action is still less. Factors influence the intention to participate depend on what matters that dominate them. They have to wait until there is a party that is able to empower them. So, the government task is to empower them, to enable three things become action: Knowledge, Concern and Awareness."

Waste littering into river has become the concern for every party. The consequence of littering fines to prevent this action becomes increasingly uncontrolled; creates pro-contra between local authority and NGO as implied:

CA answered:

"Two approaches are used for encouraging waste management within community, they are incentive and disincentive approach. Examples for incentive are the means and infrastructure of waste, while the examples of disincentive are waste service tariff gets more expensive and more measurements for administrative policy. The litter law has little to no effect towards community behavior. The enforcement of the law is part of the duties of apparatus of sub-district and under sub-district agency; however the apparatus doesn't seem to understand their function within community, they keep thinking on the other way around that the enforcement of litter law is part of the Cleaning Agency's tasks."

JP answered:

> *"If community is given the waste facilities, it is ascertained that community will stop their behavior. On the other hand, if community is given sanction, they will oppose. The most important are the solution and facilities, get along with community, make approach and community empowerment."*

Figure 4.4 depicts the waste littering points in the riverbanks of Bidara Cina.

Figure 4.4 Some of waste littering points in Bidara Cina
Source: Author, 2011

4.6 Summary

The research looked at how demographic and socio-economic characteristics of household might influence community awareness and behavior with respect to waste management hierarchy. The causal links which were applied for this study namely how their awareness affects their behavior and why community commits to the littering into river. Informants' responses helped to build the explanation through the iteration for the casual links of waste awareness and behavior. In the end, the findings from data analysis were examined using data sources triangulation. The next chapter will present the result and discussion for this case study.

CHAPTER 5: DISCUSSION

This chapter attempts to highlight the interesting and illuminating results that might contribute to the knowledge field and the implications of this study for theory, practice and future research. The findings of questionnaire and interviews may have a tendency to result a negative picture of the current situation regarding the household waste management in Jakarta, particularly within the community of Bidara Cina, as follows:

1. Community practice of waste storage was limited to only use transparent plastic bags for their household waste. Trash and garbage of neighborhood were excluded from their treatment. The waste storage aimed for facilitating waste collection process which was operated by cart worker. Zurbrügg (2003, p.3) described the elements of a typical waste management system in a low-income Asian country:
   - Household waste generation and storage
   - Reuse and recycling on household level (includes animal feed and composting)
   - Primary waste collection and transport to transfer station or community bin
   - Management of the transfer station or community bin
   - Secondary collection and transport to the waste disposal site
   - Waste disposal in landfills

2. In order to enable the waste collection service thorough neighborhood, Cleaning Agency allowed private agencies to take part in waste collection services, such as providing the cart worker, and establishing waste containers. During the research, community disclosed their concern of the absence of cart workers in several points of neighborhood, therefore, they had to walk far to reach communal waste bin or transfer station. Zurbrügg (2003, p.11) verified that solid waste management is a complex mechanism that comprise

environmental impact, financial and economic calculations, social and cultural issues, the institutional, political and legal framework, although it seems more likely to be a technical challenge for the planning and operation of a sustainable solid waste management scheme.

3. The presence of empty spaces was one of the influencing factors that influence community behavior to dispose their waste. They assumed waste burying was the most appropriate method to prevent the epidemic of scarlet fever. Regarding the use of backyard for burying the waste, Mangkoedihardjo et al (2007, p.33) argued the term of "Not In My Back Yard" (NIMBY) as the paradigm attitude of householders has to be replaced into the new insight "Now I Must Be Involved" (NIMBI). It leads people to utilize reusable things that have been thrown at any point of waste disposal. However, community still needs time for applying this simply changing method into their daily practice.

4. Generally, the phenomena of waste littering into river stemmed from the reluctance of community who inhabited riverbank to reach communal waste bins that were located far from home and rarely available, therefore, waste littering into river had become a normal occurrence. Earth Link and Advanced Resources Development (ELARD, 2004, p.2-5), exposed the example of municipalities of Caza of Jbeil are also often incapable of ensuring proper collection and disposal method, especially in rural areas, mainly due to economical constraints.

5. According to the particular event within these three *RW*s, waste awareness and behavior of Bidara Cina riverbank community were strongly related to the interest and sense of each head of *RW*s. Participants from three *RW*s had shown similar evidences of causal links between waste awareness and behavior.

Level of education had been emphasized by each of *RW* heads as one factor that determined community's awareness and they had put their attention congruously for the lack of waste equipments, especially communal waste bins. Meanwhile, Zurbrügg and Ahmed, (1999, p.2) justified the solution for solving the waste collection problems in low-income areas may generally suggest the self-help and the use of community participation.

5.1 The Iteration of Provisional Theory

Findings encapsulate that the correlation between waste awareness and behavior resulted the causality. Significant waste awareness could lead to changing waste behavior for several reasons like motivation, incentives, and economic value of waste as resulted from the iteration of provisional theory in Chapter Four. The process of iteration stemmed from the initial proposition as follows:

- **Initial proposition**

Waste awareness has stronger tendency to increase desired waste behavior than any other variable.

- **The result of first iteration from the use of literature and evidence**

Waste awareness has significant tendency to increase desired waste behavior

- **The result of second iteration from the use of evidences**

Waste awareness has significant causal tendency to conditionally increase desired waste behavior if other variable appears as belief variable (see page 52).

- **The result of third iteration from the use of evidences**

Waste awareness has more significant causal tendencies to conditionally increase desired waste behavior if one variable appears to support two other variables (see page 53).

- **The result of fourth iteration from the use of evidences**

Waste awareness has most significant causal tendencies to conditionally increase desired waste behavior if one variable appears to control the result of three other variables (see page 59).

Even though, a well-educated respondent was more likely to be correlated to have good waste awareness which might improve their waste behavior, yet the good waste awareness was not casually related to positive waste behavior.

From the iterations, the final provisional theory was therefore able to draw the inference of other causal link namely the phenomena of why people commit to waste littering into river was seen as the consequences of the absence of motivation, incentives mechanism and the lack of economic value of waste which in return brought the reluctance on community to dispose their waste in communal waste bins that were not strategically located. However, *RW* 05, 07 and 14 generally carried out the similar scheme of waste management practice which consists of storage, collection and disposal.

5.2 Practical Approach toward Waste Awareness and Changing Behavior

In order to address the answer of research questions, this study employed the philosophy of Sustainable Development Diamond or 4Es (Encouraging, Enabling, Engaging, Exemplifying) which was designed by Defra, to induce the interventions that may change waste awareness and behavior of community (Collier, 2010).

5.2.1 Encouraging

Encouraging, (giving the right signals-incentives and disincentives) which is taken as the measurement for motivation.

According to waste management practices of *RW* 05 and 07, separation as the initial part of recycling action had improved within community. However, *RW* 14 did not attempt to include recycling action into their waste management practice since they could not seek any benefit from the process of recycling. Therefore, this unawareness might be anticipated by an assured-system that able to motivate community to start recycling, for example, provide a market based mechanism that helps encouraging people to produce recycling products.

5.2.2 Enabling

Enabling, (make it easier-systems and capacity) which is assumed as the supporting factor. The most salient problem of secondary waste treatment amongst these three *RW*s was the lack of waste facilities of communal waste bins that resulted negative behaviors, such as waste littering into river and stack of refuse in the curbside street. The service workers were not able to reach the whole area since the houses were located in the cramped walkway areas. Community needs to be facilitated by sufficient infrastructures that enable them to change their negative behavior into positive behavior, for instance, door step collection of household waste as part of the waste reduction/ minimization infrastructure.

5.2.3 Engaging

Engaging, (get people involved-who/how target) which can be related in a campaign that appeals to raise community's understanding of waste awareness and their behavior standard. Based on findings, riverbank community tended to commit to waste littering into river as if there was not any norm that inhibited their action. It has been concluded that their waste awareness was affected by education level. Consequently, riverbank community who was categorized as less educated group seemed to embrace low waste awareness. A frequent waste

education forum was confirmed by one participant as the means of raising community's waste awareness.

5.2.4 Exemplifying

Exemplifying, (lead by example-shared responsibility) which related to the presence of a leader who performs within community which might be followed by establishing a body of shared responsibility dedicated to facilitating positive actions of community from various segments. As the facilities and waste education established by local authorities are becoming available within community, the role of leader is needed for coordinating the use of facilities and to be the representative of local authorities to ensure the understanding of waste management. During the research, *RW* 05 became the only one example of shared responsibility that was being enthusiast for waste recycling and composting in comparison with other observed *RW*s.

5.3 Implications for Theory and Practice

The concept of correlation between waste awareness and behavior has been established through many studies with variety findings and results. As this study discovered how riverbank community awareness affected their behavior and why this community commits to waste littering into river, hence, this study generated some important insights that might enlighten the significant relationship between waste awareness and behavior. Three sources were generally utilized to show these enlightenments. The first was the explanation of factors that influenced waste awareness, as the success of community participation in solid waste management is derived from awareness factor (Muller, 2002, cited in in Shukor et al, 2011, p. 970). Moreover, Mockler (1998) added community empowerment has been introduced since 1980's to communities in Indonesia which are expected to get used to correlating primary and

secondary waste collection system (cited in Richardson, 2003 Jan 10, p.6). The four approaches to empower community were also discussed (cited in Shukor et al, 2011, p.969).

The responses of respondent generated one of most essential findings in this study, to clarify that waste awareness of community had most significant tendency to conditionally lead waste behavior if three other variables appear, namely belief variable, supporting variable and control variable. While, other literature suggested formal institution and waste education program as the means to shape community's awareness in order to create community participation. As it can be concluded, the education program together with the establishment of motivation and incentives were the most important thing to capture community waste intention and awareness to produce changing waste behavior. Thus, this insight has encapsulated the important implications specifically for waste management planner of local council to establish an understanding with community over their expectation for waste management (Zurbrügg and Rehan Ahmed, 1999 cited in Shukor, 2011, p. 971).

Second, this study also involved the explanation for aspects that influenced waste behavior of community. The main idea of this study was to include socio-demographic variables, then to examine the correlation between waste awareness and behavior which has proven the similar results as previous studies (Post, 2007, p.20). There has also been a little discussion for the presence of local leader to bridge the importance of municipalities and community since this aspect was found in this study as the interest and sense of local leader influenced community behavior (Anschütz, 1996, p.19). All the local leaders that were interviewed in this study stressed the lack of communal waste bin. Though, the most determining part was the government's approach to stimulate community waste behavior with the facilities that they needed the most.

Third, the Sustainable Development Diamond or 4Es by Defra was used for approaching the solution to the issue of community awareness and behavior (Collier, 2010). This research also

identified other occurrences that contributed to the correlation between waste awareness and behavior.

As examples, community's waste behavior raised in the rainy season, yet, this action turned out into unconsidered behavior as they buried the waste in order to avoid the epidemic of Aedes Aegypti fever. Similarly, the propensity of community to practice waste separation for inorganic waste, however, still committed to waste littering for organic trash into river has confirmed the finding of research from Meidiana and Gamse (2010, p.202) that people in Indonesia are more likely to choose less effort of actions with regard to waste disposal.

5.4 Implications for Further Research

Since this study focused on the correlation between waste awareness and behavior of riverbank community, with government's approach to address the issue of community waste awareness and behavior, thus, the further research is required in this area, specifically, the potential of private sector engagement within community waste management through the role of Corporate Social Responsibility (CSR). In order to address the issue of community reluctance to participate in recycling action, private sectors may take part to establish a recyclable goods market (Aprilia, n.d, p.6).

5.5 Summary

This chapter emphasized on the key findings and the result of iteration which were previously discussed in Chapter Four to be the highlights of this study. Sustainable Development Diamond (4Es) by Defra was also presented in this chapter to provide solution approach for the issue of findings. In the end, the implications of theory and practice have confirmed the theoretical basis and enlightened the findings in this study then the implications for future research were also presented.

CHAPTER 6: CONCLUSIONS

6.1 Introduction

This chapter summarizes and concludes the thesis, along with the closing remarks at the end. In this present study, the author built the explanation of correlation between waste awareness and behavior with respect to influencing factors, as well as the overview of current existing condition of household waste management within Bidara Cina community. Four objectives was designed and analyzed using six research questions to suggest the focus of this study.

6.2 Conclusion on the Objectives

In order to summary the findings of this study, this section revisits the four objectives as stated in Chapter1. This thesis provided framework of solid waste management of low income groups, particularly Bidara Cina community as the residents of Ciliwung riverbank. Within this framework, the answers for research questions were discovered and various perceptions and attitudes of community were revealed toward their waste practice.

6.2.1 Conclusions on the Overview of the Current Existing of Solid Waste Management of Household Waste

It is critically important to get to know the waste management system that had been undertaken by community especially within their respective households. Physical and social status of each *RW* which were defined in Chapter Three affected their current existing condition of household waste management system. Based on findings in Chapter Four, all community associations (*RW* 05, 07 and 14) generally run storage-collection-disposal, yet had variety kinds of waste disposal method affected by their surroundings.

6.2.2 Conclusions on the Factors Influencing Community's Waste Awareness and Behavior

Factors that influence community waste awareness and behavior consist of internal and external factors. In this research study, internal factors covered socio-demographic variables of community, while external factors covered the role of leader and government's approach. A number of previous studies were discussed in Chapter Two that these variables and factors might have influenced community awareness and behavior. Similarly, the summary of findings with regard to influencing factors in Chapter Four revealed that level of education and traveled-time of home-river produced significant result among other socio-demographic variables. The characteristic of local leader simply shaped community's behavior, yet, government's approach was the most required factor that entailed the presence of community participation.

6.2.3 Conclusions on the Correlation between Waste Awareness and Behavior

As concluded in Chapter Five, the correlation between waste awareness and behavior has resulted causality. The initial proposition has been sufficiently iterated through the evidences from Chapter Four and resulted motivation as the belief variable, waste incentives as the supporting variable and economic value as the control variable that affected the correlation between waste awareness and behavior in this study.

6.3 Recommendations

This study has shown the prospect of improving the practice of waste management of community in Bidara Cina. The author compiled the suggestions from different levels, such as the donor, observer and service provider for supplementing recommendations. As has been mentioned by the service provider (Cleaning Agency) in Section 4.5.3 that only 40% of total community who run properly waste management system, recommendations are therefore crucial to be established in the form of incentives and disincentives mechanisms as follows:

- ***Incentive Mechanisms***

1. Nominate a group of paid-cadre within community to bring the task as the envoy of recycling and composting. This group has to be able to empower community with the knowledge gained from available information provided by local authorities.
2. Launch the waste bank program. This should be supported with other community activities to attract community attention. Private modern minimarket is probably involved as the facilitator for selling the products of waste bank.
3. Establish a recycling and composting competition to encourage community for actively participating recycling and composting activities. This action should be annually taken into account by local authorities.
4. Use the momentum of Corporate Social Responsibility (CSR) as part of the green activity of large known companies to empower community for their waste activities.

- ***Disincentive Mechanisms***

1. Provide the access for waste storage and collection as the means to prevent waste littering into river. Some of households had to go to transfer station directly which was located not in the fast reachable area. The solution is to locate smaller capacity of transfer station strategically in reachable areas, for example, communal waste bins in medium to large capacity which located every 10-20 meters within their neighborhood.

2. A new strict regulation should be arranged to prohibit waste littering into river. A controller has to be assigned to routinely inspect the neighborhood, especially near to the river. The punishment may be subject to decreasing incentive allotment of each *RW*.

6.4 Limitations of Study

Although this research was carefully prepared, the present study has certain limitations and shortcomings that need to be taken into account when considering the study and its contributions. First of all, the research was conducted for seven weeks within three *RW*s of Bidara Cina which had total population of 9620 inhabitants (Table 3.4). This research period was ascertained far from enough to observe all of community waste activities. It would be a comprehensive study if it was done in a much longer period. Second, the limited number of respondents (nine community respondents) might have not definitely represented the whole picture of solid waste management in these three *RW*s of Bidara Cina. Therefore, the study included other respondents from different levels to generalize the results for a large group (two experts from different areas). Third, the set of answers of questionnaires as the result of in-depth interview which was assigned to be narrative form in this thesis had to be translated from Indonesian language to English which might have decreased the literal meaning of respondents' utterances.

6.5 Closing Remarks

This thesis presented a framework for gaining the understanding of correlation between waste awareness and behavior. It addressed the internal aspects, such as socio-demographic variables and external aspects, like the role of local leader and government's approach that might have practically affected the relationship. The findings provided evidences to rule out

the initial proposition which eventually drew motivation, incentives and economic value of waste as other variables that affect this correlation.

This study considered level education as the generalization point that determined the scope of waste awareness, while the absence of communal waste bins become the most relevant cause of waste littering into river. In line with this illustration, enlarge the range of community knowledge through community empowerment may increase their awareness and motivation. However, this community effort has to be commenced together with government's approach like incentives mechanisms in order to improve community waste behavior.

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APPENDIX 1

QUESTIONNAIRE GUIDELINES

Astari Minarti

International Master of Environmental Sciences

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WASTE AWARENESS AND BEHAVIOR QUESTIONNAIRE

For Bidara Cina Community

Date:

Location:

- I kindly ask your willingness to fill in the questionnaire based on your true experience and knowledge
- This questionnaire was made in order to collect all the related information for supporting a compilation of master-thesis.
- The identity of respondent and the answer will be fully concealed. Interviewees will be asked to respond only those questions for which they judge they can contribute an informed opinion.
- I'd like to thank you for agreeing to participate in this survey. The objectives of this research are:
  1. To study existing waste practices,
  2. To find out the factors influencing the community waste awareness
  3. To discover the correlation between Bidara Cina community awareness and their waste behavior on waste management hierarchy practices at the level of household
  4. To provide recommendations for stakeholder who concerns with the waste improvement in Bidara Cina.

A. RESPONDENT IDENTITY

In this first part, the interviewees will be requested to answer the questions over their socio-economic indicators. The questions are open-ended as the following:

1. Name :
2. Age :
3. Gender :
4. Address :
5. What is your recent occupation?
6. How much income do you earn per month?
7. What is your last education?
8. What is your residence status?
9. How long have you lived in this area?
10. How long you need to reach the river bank from your home (in minute)?
11. How much the volume of waste do you produce per day (in liter)?

B. WASTE AWARENESS

The second part of open-ended questionnaire will be used to encourage the community to reveal their concern over waste awareness.

B.1. Awareness

1. What is your concern about refuse around your neighborhood?
2. To what extent do you worry about refuse around your neighborhood?
3. How interested would you say you are in refuse around your neighborhood?
4. What kind of refuse that you usually dispose?
5. How do you regard the refuse with the flooding around your neighborhood?
6. What is your response to local government's appeal about waste management?

B.2 Preferred method for waste disposal

1. Which of these methods of waste disposal below would you like to be put into use in your neighborhood?
2. Why do you prefer one of these methods to be put into use in your neighborhood?
3. If you are asked to mix two of them, which will you choose?
4. How do you consider the impact that will emerge of each method of your choice?
5. Based on your initial thought, which one is the best to be used in your neighborhood?
    a. Burying wastes in landfill sites
    b. Burning / incinerating wastes
    c. Composting
    d. Recycling
    e. River as waste disposal
    f. Open dumping

B.2 Common waste problems on neighborhood of riverbank

1. What do you think about waste issue in your neighborhood?
2. What kind of waste problems that you usually find in your neighborhood?
3. How often do you find the problem over the waste in your neighborhood?
4. How do you react when you find waste problem around your neighborhood?
5. Who do you think should be responsible for the waste problem around your neighborhood?

C. BEHAVIOR

The third part of open-ended questionnaire will be used to observe the pattern and motivation toward waste behavior of community.

C.1 Waste disposal method is currently used by community

1. What is your currently disposal method?
2. Why do you use the currently disposal method?
3. How long have you used this currently method?
4. What do you need to facilitate or change your currently disposal method?
5. What do you think about paying the wage of waste service if it could be implemented in your neighborhood?

C.2 Responses to items on practices

1. What is your description about the trash bin?
2. How many trash bins do you have at home?
3. Where do you usually throw your household waste?
4. What will you do when you find a full trash bin at home?
5. Who has been mostly doing the collection of household waste at home?
6. What do you think if you have to change your ways in order to reduce the amount of waste generated at home?
7. How do you describe yourself for being a participant in waste management and hierarchy activities in communities' organizations?
8. How important are the training, seminar, workshop on environmental education or management for waste practices in your neighborhood?
9. What is your consideration for reuse or recycle something rather than throw it away?
10. What is your expectation for waste practices and management in your neighborhood?

Astari Minarti
International Master of Environmental Sciences
University of Cologne – Germany

WASTE AWARENESS AND BEHAVIOR QUESTIONNAIRE

For scholar, expert and any stakeholder

Date:

Location:

- I kindly ask your willingness to fill in the questionnaire based on your true experience and knowledge.
- This questionnaire was made in order to collect all the related information for supporting a compilation of master-thesis.
- The identity of respondent and the answer will be fully concealed. Interviewees will be asked to respond only those questions for which they judge they can contribute an informed opinion.
- I'd like to thank you for agreeing to participate in this survey. The objectives of this research are:
  1. To study existing waste practices,
  2. To find out the factors influencing the community waste awareness
  3. To discover the correlation between Bidara Cina community awareness and their waste behavior on waste management hierarchy practices at the level of household
  4. To provide recommendations to the stakeholders who are concerned with the waste improvement in Bidara Cina.

The answer of each question will be used to support community's answer over their knowledge and experience.

A. Respondent Identity

Name :

Institution :

Position :

B. Waste Awareness

1. How important do you regard the way community throws away the refuse?
2. How satisfied are you with the community when they handle their refuse?
3. Why is it so important to do reuse, reduce and recycle?
4. What can people do to support source reduction?
5. What can the average person do to increase composting activities in their community?
6. How do you regard littering with flooding?
7. Do you think people will stop littering if they are fined?

C. Waste Behavior

1. How is the condition of waste management in Bidara Cina?
2. How is the availability of waste facilities in Bidara Cina?
3. How is the surveillance mechanism for waste management in Bidara Cina?
4. Why do you think the community is not likely to do recycle activities?
5. Why is litter law not enforced among community?
6. How is the community's participation toward waste management in Bidara Cina?
7. How is the private's participation in waste management in Bidara Cina?
8. What is your suggestion or recommendation for waste management in Bidara Cina?

APPENDIX 2

DESCRIPTIVE NOTES OF EACH RESPONDENT

- **RESPONDENT A**

The interview with respondent A took place in the secretariat office of *RW* 14. The time schedule of interview was previously approved between the author and respondent. Respondent A which had stocky body appearance kindly welcomed the author with casual outfit and special Indonesian cap on the head. The respondent sounded familiar to speak with Jakarta's dialect. The secretariat office looked so clean and well-equipped which could be seen from the availability of two units of computer which was acknowledged as the donated items from Respondent A since become the leader of *RW* 14. Some personal remarked from Respondent A that the desire to have composting activities for spending the retirement time, "*If possible, I want to take benefit from composting activities when I get retired.*"

- **RESPONDENT B**

Similarly, the interview with Respondent B was undertaken in the secretariat office of *RW* 14 together with Respondent A. Respondent B who were preparing the mineral water when the author came, wore the casual outfit like T-shirt and jeans. From the dialect, Respondent B seemed to be the immigrant from Java. Respondent B also stated the desire to empower community through waste bank as the remarks, "*I've been waiting the attention of local authorities to provide us with waste bank. I think it will stimulate communities like in other under sub-district areas (Kelurahan) in Jakarta*."

- **RESPONDENT C**

Respondent C was randomly chosen at the time of research. The interview was occurred in the house which appeared to be ordinary house located in cramped alley. The respondent wore the loose clothes just like the typical Indonesian women wear. The questions were answered in Jakarta's dialect as this noted the respondent was not the immigrant. Respondent C resisted the assumption if the waste littering was committed by the community of Bidara Cina itself, "*No, we don't commit to waste littering into river, it comes from other sub-district.*"

- **RESPONDENT D**

  As the time of interview was approved, Respondent D kindly welcomed the author in the house which was also located in cramped alley. The small posture of Respondent D yet solid with familiar Jakarta's dialect showed the persistence for leading the communities of *RW* 07 as becoming the leader of *RW* 07. The interview, sometimes, was interrupted by the incoming calls on Respondent D's cell phone. During the interview, Respondent D' responses over waste management was more exposed to how to deal with waste after flooding as the flooding was the frequent occurrence, as the remarks, "*Waste becomes the dilemma after flooding, as the water reach the roof of the house, so the sludge remains*."

- **RESPONDENT E**

  Respondent E was interviewed together with Respondent D which dressed like a typical housewife. The house was fully displayed with the collection of photos of community activities. The nice attitude of the respondent and detail answers for the interview gave clear overview of waste management in *RW* 07 even though the respondent was not originally from Jakarta which could be judged from the dialect. Respondent E disclosed the method of waste disposal in regard with concern of outbreak, "*Waste sometimes is buried in our backyard if there is no other place to keep and also to avoid the stench. We also bury the used food or drink cans in order to avoid the hazard of Aedes aegypti*."

- **RESPONDENT F**

  Respondent F was suggested by Respondent D since having the task as youth community leader in *RW* 07. This respondent rented a room in Respondent D's house, so that the interview took place in Respondent D's house. The respondent admitted was being busy preparing the mitigation action for anticipating the flood. The small posture did not limit the respondent from being active within the neighborhood. When the respondent was asked about the concern over waste, several remarks were confirmed, "*We, the youth group take the benefit of waste from recycling the used plastic cups that we sell to the receiver. We save the money for ourselves*."

- **RESPONDENT G**

  The interview with Respondent G took place in Respondent G's house after office hours. It was located almost near to riverbank. The interview was undertaken with relax as sitting in

the floor. The interview was several times disturbed by the presence of Respondent G's children who were playing in the house. It became more difficult to focus since the voice of Respondent G was very low as the voice was influenced by the character of Javanese, one of the tribes in Indonesia. However, the interview had disclosed one great finding, as Respondent G was the leader of *RW* 05 which had commenced the erection of waste separation posts which located just right in the riverbank, "*Sanggar Ikhlas (the name of the posts) was built three years ago, yet the equipment for the post has just been implemented since 2010. We reach the waste separation for almost 50% of total inorganic waste*."

- **RESPONDENT H**

  The interview with Respondent H was undertaken while going around the neighborhood of *RW* 05. The respondent was finishing the house errands when the author came. The dialect of the respondent was pretty much viscous with Jakarta's accent. The trip stopped in the waste separation posts belong to *RW* 05's community to take some pictures as one person was taking inorganic wastes from the river using stick nets. While surveying the riverbank area of RW05, the respondent indicated some actions of communities that still committed to waste littering into river like, "*it is true that people still commit to waste littering into river because the communal waste bin is located far from them*."

- **RESPONDENT I**

  This respondent was randomly chosen as the house was located right in the riverbanks. The respondent was the immigrant from Java. The interview occurred in the backyard of respondent's house. The experience with flooding did not render the respondent to be wary for inhabiting the area of riverbank. Yet, the respondent admitted, "*We have some benefits by living in the riverbank. Wastes that flow with the river stream are able to be sold and the value is sometimes beyond our estimation*."

- **EXPERT 1**

  The first expert was selected from government agency which is responsible for city sanitation. Before the author started the interview, the confirmation letter of author's university was asked by respondent. The interview took place in respondent's office. Sometimes, the interview was interrupted with respondent's duty to sign several documents. Even though the respondent spoke in the very low voice and sounded like Javanese accent, the interview provided many details of general information in regard with waste

management of Bidara Cina community. When the respondent was asked about the issue of waste littering and flooding, respondent answered, "*There is no firm regulation that prohibits waste littering into river. In further time, a new regulation will be arranged for governing the prohibition of waste littering into river*."

- **EXPERT 2**

  The second expert was suggested by Respondent G as this respondent was incorporated into Non-Governmental Organization who put the action to make better Jakarta. The interview took place in Respondent G's house. The respondent came to respondent as received a call from Respondent G. This respondent owned the appearance as other activists; the voice had high tone when the respondent shared the result of NGO's observation. As the interview started, the session of debriefing changed into discussion when the respondent shared some overviews with respect to Ciliwung river and the relation with community waste behavior. The respondent also indicated the interest of one of the biggest private companies in Indonesia for being engaged in community waste management as the implementation of Corporate Social Responsibility (CSR). Several notions were shared by the respondent to delineate the real situation of waste management in several riverbank areas, "*The community has been waiting for an institution that is able to drive them. The task of local government is to combine three vital components as the action, namely knowledge, concern and awareness*."