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Changes on Recycling Behaviors Based on Governmental Programs (Study Case in Bendungan Village, Indonesia)

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Abstract: *Environmental problems such as erosion, flooding, are mainly caused by human activities itself. Due to main environmental problems mainly came or originated from man, the solutions or prevention effort to repair the environment, must involve human factors in its planning. In Indonesia in general, including in Bendungan Village, limited insight, lack of skills, poor health, and a low work ethic are all internal factors that cause environmental problems. Furthermore, the lack of knowledge about the environment is one of the causes of the emergence of environmentally destructive behavior that is carried out unconsciously. One of the problems in this village is garbage, people throw garbage into drains and empty land because they are not aware of the consequences of their actions. One solution that exists to solve environmental problems by involving human factors in it is through capacity building, one of which is through a sustainability education and incentive given by the West java Government. Through this concept, citizens are given education about the impact of their previous behavior, one of them is the behavior of littering. The program also provides economic value to waste so that there is an incentive to maintain the condition or waste managing waste in their village. This research used Mixed Methods approach (quantitative and qualitative) and use secondary data review, direct observation and semi semi-structured interviewing to collect the data. This research found that the main factor for the success of this program is the people who willing to be open concerning the program and its concepts, thus becoming aware about their environmental problems, they willing to work for the benefit of their village. In this village the push factor are economic and re-education aspects that move the people to save their environment. The economic benefit from garbage bank also have helped this program. The obstacles to the program in this village are the lack of facilities that they have, and for cadres to teach people about the environment, the lack of the government to provide formal education for the people and the last obstacle of this program is the economic factor, low amount of sellable garbage such as PET and cans have become major obstacle in promoting garbage bank.*

Keywords: Waste, Recycle, Sustainability, Community, Garbage Bank, Government Program

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I. Introduction

Environmental problems such as erosion, flooding, are mainly caused by human activities itself. Then, it can be said that the main source of environmental problem is human itself. Due to main environmental problems mainly came or originated from man, the solutions or prevention effort to repair the environment, must involve human factors in its planning.

In Indonesia in general, including in Bendungan Village, limited insight, lack of skills, poor health, and a low work ethic are all internal factors that cause environmental problems. Internal factors can be triggered by the emergence of external factors as well. Poor public health is a sign of low community nutrition. The low level of community nutrition is the result of low income and limited access to natural resources. Furthermore, the lack of knowledge about the environment is one of the causes of the emergence of environmentally destructive behavior that is carried out unconsciously. One of the problems in this village is garbage, people throw garbage into drains and empty land because they are not aware of the consequences of their actions.

The complexity of environmental problems in Indonesia results from various polemics and opinion differences between communities, groups, and agencies. These differences and contradictions stem from what causes these environmental problems and how to deal with them (wicked problems).

According to the World Bank (2010), the main sources of environmental problems in Indonesia can be summarized as follows: (1). Global warming and climate change; (2). Forest and water flow management; (3). disaster management; (4). Policies, institutions and operations; (5). Coastal resources and coral reef ecosystems.

The latest solution in environmental science in tackling environmental problems, namely through the integration and cooperation of various parties because environmental problems in Indonesia are related to social problems as well. With a very dense number of populations, Indonesia has many social problems. The social problem itself threatens the values of a society so that it affects the majority of community members. Social problems, mainly poverty and the lack of education made the environment worsen. Poverty made the people less concern to the environment and the lack of education made people failed to realize the impact of their behavior to the environment. One solution that exists to solve environmental problems by involving human factors in it is called capacity building.

II. Research Methods

The study design is a summary of the framework that contains the variables to be studied and the relationship between these variables which are presented in the form of a diagram or other form. The research design used in this study is mixed methods (quantitative and qualitative) (Creswell, 2010).

A. Research Objects and Locations

Bendungan Village is located in the Bendungan Village, Bogor Regency, West Java, Indonesia. The object to be studied is the environment around the village, both the physical environment and the social environment.

This location was chosen due to the massive land conversion that resulted in environmental degradation (deforestation, flooding and CRB / Citarum and Ciliwung River Basin's pollution).

Bendungan Village is located in Ciawi Subdistrict, Bogor Regency, West Java, Indonesia. It is one part of Bogor City which has a land area of 132.9 Ha. It is located in coordinates 106.861984 East Longitude / -6.668112 South Latitude. Administratively, this village is limited by:

- ?
- ?
- ?
- ?

North border: Pandansari Village
South border: Sukamahi Village
East border: Sukamahi Village
West border: Banjarwaru Village/ Ciawi

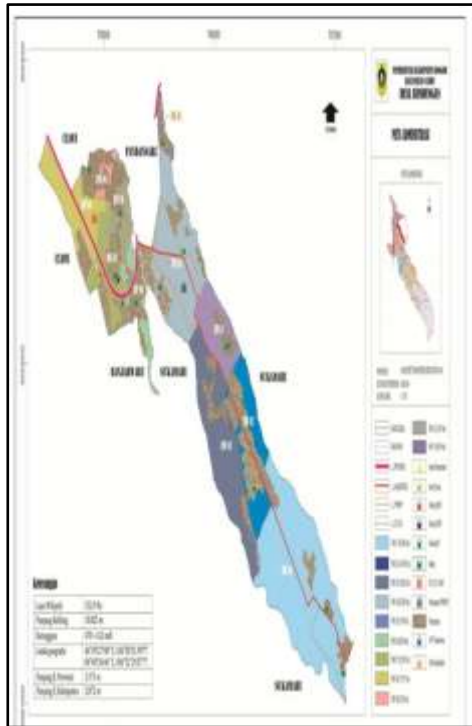


Fig. 1 Ciawi Sub-District Administrative Area
Source: Documents of the Department of Spatial Planning and Creation.

B. Qualitative Data Collection

Assessment of this study lead to social and environmental factors that are descriptive terms in order to gain a complete and in-depth research. Qualitative approach, will investigate the interactions that occur between the community and the environment, in this case the waste management efforts out. The focus of this research are the behavior, expressions, and emotions that society considers their experience in environmental management.

Qualitative data analysis is an ongoing process that requires continuous reflection on the data, asking questions analytically, and writes a brief throughout the study (Cresswell, 2014). Activities and qualitative data analysis are ongoing continuously until the data and information obtained in the field are saturated or do not show anything new.

C. Qualitative Data Collection Techniques

Primary data is data collected from the object of research conducted intensively using observation techniques, semi-structured interviews and documentation. Qualitative interviews are unstructured (unstructured) and open (opened) designed to elicit views and opinions from the participants (Cresswell, 2010).

To see the conditions at the research site, non-involved observations were also carried out. Qualitative observations with this technique are observations in which researchers go directly to the field to observe the behavior and activities of individuals at the research site without being directly involved with the object of study (Cresswell, 2010).

D. Quantitative Data Collection

The unit of Bendungan Village community, Ciawi Sub district, Bogor Regency is the unit of analysis for the sample on quantitative data collection. The samples were selected randomly (random sample), as stated by Creswell, so each individual in the population has the same probability to be selected. Thus, all the inhabitants of the Village have an equal chance to be the respondent.

Calculations were performed using the formula of Taro Yamane or Slovin as follows (in Stephanie, E: Slovin's Formula Sampling Techniques. Houghton-Mifflin, New York, USA):

$$n = \frac{N}{Nd^2 + 1}$$

Where :

n = Sample

N = Total Population of Bendungan Village in Ciawi Sub district
District (10,741 people)

d = Deviation / Sampling Error (10%) with level of confidence in the data is 90%

The random nature of the respondents is assumed to have been represented through random techniques, thus making the questionnaire have sampling error of 10% ($d = 0.1$). The level of confidence or precision of the data by 90%. By using this equation is obtained the total sample are 99 people.

E. Secondary Data Collection

Secondary data is needed to accelerate understanding of field conditions. Secondary data is needed to accelerate the understanding of field conditions, population demographics, environmental management policies and other reports. Data are collected by means of collecting, recording, or quote and learn from a variety of documents obtained from DLH West Java Province and also from publications and relevant reports related to the research conducted.

III. Literature Review

A. Sustainability

With the demands of globalization, Indonesia follows the development without seeing the prospect of the future as same as any other nation in the world. The sporadic and fast development, along with the consumptive behavior of people has been ingrained in most Indonesian society. The fact of development that is only partial, instant and following only consumptive covetousness has led to destroyed environment, cultural abandonment (changing into consumptive behavior). Thus, with the concept of Sustainable Development, which is next will be abbreviated to be called SD, will give a new discourse on the importance of preserving the natural environment for the future, the next generation.

Sustainable has been described in many literatures and international agreement, most of them agreed that sustainable consist more than one element, not only environment, but human aspects also, which include social aspects, cultural aspects, and economical aspects.

Korten described that:

“while there is growing recognition of the need for change, much of the response appears superficial (e.g. buying greener' products), and to learn to live in partnership with one another and the living Earth - does not appear to be an approach embraced by much of modern society”.

As Korten described, present sustainable practices only focused on being “green” without concern on the most crucial cause of the destruction and potential solution of this problem at the core, which is human and its system, including economic, social, cultural, and spiritual systems.

B. Understanding Sustainable Development

According to Brundtland Report from the UN, 1987. Stated that, one of the factors that must be faced to achieve sustainable development is how to improve the environment without sacrificing the need for economic development and social justice.

A report from the 2005 World Summit, which outlines sustainable development as consisting of three interdependent and reinforcing pillars (economic, social and environmental). UNESCO in 2001 further explaining this on The Universal Declaration of Cultural Diversity further explores the concept of sustainable development by stating that "... cultural diversity is important to humans as the importance of biodiversity to nature". Thus "development is not only understood as economic development, but also as a tool for achieving intellectual, emotional, moral, and spiritual satisfaction". In this view, cultural diversity is the fourth policy of the scope of sustainable development policy.

The European Union on try to integrate this on their study as stated on Sustainable Development in a Diverse World (SUS.DIV). These documents stated that the EU will integrate multidisciplinary capacity and translate cultural diversity as a key or new strategy for sustainable development. The study done based on this framework will be used for their policies for sustainable development. This document also shows that the important of multi-disciplinary approach to achieve sustainability of a nation.

C. Increased local economy through the existing potentials in the area and awareness of economic actors as part of the community

The main aim of local economic development initiatives is to encourage local participation and build consensus to determine the economic and social welfare initiatives for the region and society. The concept of local economic development based on promoting local approach that responds to local needs and conditions.

Local economic development requires the creation of an environment to enabling / to support the community business in accordance with existing local businesses. Local economic development programs should aim to strengthen and re-establish good governance, and identify opportunities for sustainable income for the local community generation, especially for the poor.

Based on the above theory which states that local economic development should be able to increase the income of the poor and the development of local businesses that have been there. The obtained parameters of an improved local economy are as follows: new alternative income source for the community, economic benefit of the program to the community, sustainable potential of the program economically.

D. Changes in the economic value from the environmental problems that exist to be an economic potency

Based on West Java DLH, there are environmental problems in the Bendungan Village. Some of them are matter of household waste and waste from agriculture. This practice is called *circular economy*. According to Ellen McArthur Foundation, *circular economy* is an approach that can offer a real opportunity to develop new products and services using waste materials. Adopting new manufacturing techniques to enhance the product life cycle and reduce costs, and develop new business models founded on reusing and recycling products and services .

Based on the existing problems, one of the sustainability programs relating to the improvement of environmental issues into an economic potency is the developing of garbage bank and composting activities. Parameters of the economic value of the existing problems in the environment into the potential that can be developed are: the existence of garbage bank; community's income through garbage and trash bank; utilization of agricultural waste into new commodities such as an organic fertilizer.

E. Sustainable Businesses

Sustainable business, or green business, is an establishment that has a minimal negative impact to the global and local environment, both to the community, society, or economy-businesses. According to Cooney (2009) in general, businesses can be defined as a green business if it has four of the following criteria:

1. Incorporating sustainability principles into every business decision.
2. Supplying products or services that are environmentally friendly which replaces the demand for products and / or non-green services.
3. More environmentally friendly.
4. There is a commitment to be environmentally friendly.

Parameters of sustainable businesses consist of: increased public revenue from the development of post-harvest in household level (eco-entrepreneurships, this term can be defined as the ability of creative thinking and innovation to create something new and different to take advantage of opportunities that exist around the environment and be a product that can produce financial gains), their environmentally friendly products sold by the public, while the other parameters can be associated with ecological parameters above.

IV. Results and Discussion

A. Land Use in Bendungan Village

innovation to create something new and different to take advantage of Land Use in Bendungan Village

Land use is related to human activities in certain areas of land, such as settlements, urban areas and rice fields. Land use is also the use of land and natural environment to meet human needs in their life. Land use in Bendungan Village is showed on the table below:

Table 1. Land Use in Bendungan Village

| No. | Land Use | Percentage (%) |
|-----|---------------------------------------|----------------|
| 1. | Settlement | 24.27 |
| 2. | Government Offices | 0.32 |
| 3. | Office Buildings | 13.62 |
| 4. | Housing Complex | 9.72 |
| 5. | Resorts and Hotels | 5.22 |
| 6. | Trading Area | 0.75 |
| 7. | Education Building | 0.42 |
| 8. | Worshipping Places | 0.29 |
| 9. | Outdoor / Fields / Moor / Rice fields | 39.19 |
| 10. | Public Cemetery | 0.29 |
| 11. | Health Services | 1.47 |
| 12. | Provincial Road | 1.20 |
| 13. | District Road | 1.52 |
| 14. | Village Road | 0.79 |
| 15. | Trails | 0.85 |
| | Total | 100 |

Source : Bendungan Village Government

Based on the table above, the widest area on Bendungan Village is outdoor / Fields / Moor / Rice Fields which covering 58.850 Ha or 39.19% of the village, the second widest is the human settlement, which consist Settlement and Housing Complex areas which both covering 51,066 Ha

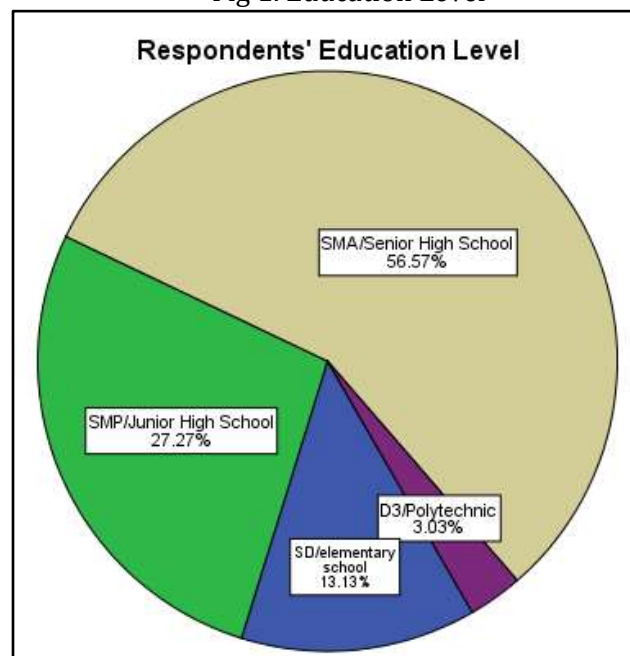
or 33.99% of Bendungan Village, while the smallest land covering is worshipping places that cover 0.441 Ha or 0.29%.

The percentage of Outdoor / Fields / Moor / Rice fields in this village means that this village have 58.850 Ha of area that need to be conserve for ecological conservation and also food security, also the wide of human settlement on the area (33.99%) means that this village have problems for waste problems from the human activities and consumptions.

B. Education Level

Based on the questionnaires, most people on this village have completed their senior high school, which is the national program for minimum education, the percentage of people who have high school education is 56.6% of respondents, but 40.4% of people still have lack of formal education. The result is showed on the figure below.

Fig 1. Education Level

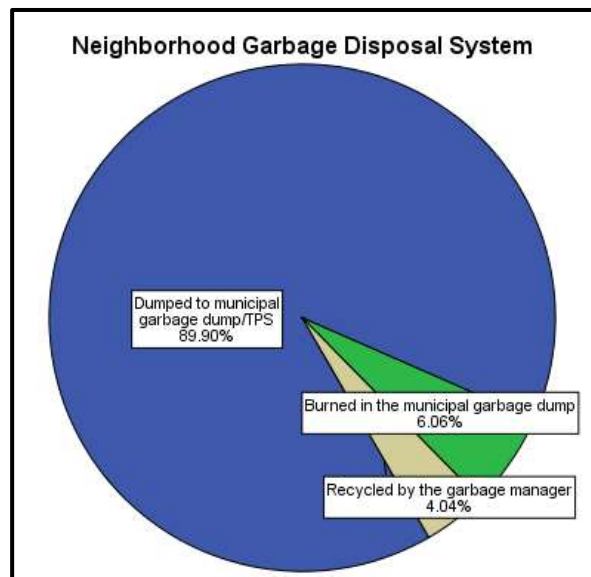


Source : Primary Data

C. Neighborhood Garbage Disposal System

Based on the researched results, all the respondents have stated that they use proper way to dispose waste, although only 4% of waste is recycled. The results is showed on the table below.

Fig 2. Neighborhood Garbage Disposal System



Source : Primary Data

D. Waste Management (Waste Separation)

The people in this village begins by separating between wet and dry garbage so that the garbage that can still be used can be taken by scavengers or used by themselves without the hassle of separating it again, so that waste processing can be done effectively and efficiently by the government and people.

Before the program, the waste management program in this village (also in Indonesia in general) is not optimal because the community does not consider it important to process waste in their respective environments. They do not have the awareness to process their own garbage. The habit is that they are still throwing garbage in the river and in any place, through the government Sustainability program, the community is given education about waste management and the economic value of waste is introduced, but the lack of markets for processing organic waste is an obstacle in this village, while for non-organic waste solutions have been found for the management is used as waste briquettes where there are private companies who want to accept briquettes for factory fuel.

After the introduction of sustainability program, the methods of handling waste or garbage and thrash is not just stop at sorting only. Furthermore, a comprehensive handling effort is needed to make the waste more useful. The results of waste separation behavior before and after the government sustainability program is shown on the table below.

Table 3. Habit on Separating Garbage

| No. | Variables | Frequency | Percent | Frequency | Percent |
|-----|------------------------|----------------------|----------------------|---------------------|---------------------|
| | | (before the program) | (before the program) | (after the program) | (after the program) |
| 1. | Separating Garbage | 22 | 22.5 | 48 | 48.5 |
| 2. | Not Separating Garbage | 77 | 77.5 | 51 | 51.5 |
| | Total | 99 | 100.0 | 99 | 100.0 |

Source : Primary Data

E. Waste Management (Waste Bank)

The positive impact of the garbage bank can be seen by the participation of the people in this village, as shown on the table below:

Table 2. Respondents' Participation on Garbage Bank

| No | Participation | Frequency | Percent (%) |
|-------|-------------------|-----------|-------------|
| 1 | Participate | 66 | 66,7 |
| 2 | Not Participating | 33 | 33,3 |
| Total | | 99 | 100,0 |

Source : Primary Data

Based on table above, it can be seen that the majority of Bendungan Village people is participating on the garbage Bank program (66.7%). It means that the Garbage Bank has change the people behavior. Now they regularly separate garbage, from organic and inorganic, and also regularly distribute their waste to the bank. This change is meant to change the habit of the people from dumping the waste directly, into separating waste and dump or distribute it accordingly.

CONCLUSIONS

The waste separation behaviors in this village are changing, based on the research it showed that before the program most people not separating their waste/garbage, after the implementation of this program the number of people who separation their waste is doubling in number, although only 4% of waste is recycled. The sustainability program implemented by the West Java Government is considered successful as stated in previous study. The program is focused on household wastes because the main problem is waste from this sector. In Bendungan Village, the program is focused on waste management of household waste, the reason is because the people in Bendungan Village have changed their consumption into mass products that leave large amount of non-bio degradable wastes.

Based on the results of the analysis it can be concluded that the push factors and the obstacles are as follows:

A. The Push Factors are:

A.1. The push factor that made the program successful in this village is the people, their social and their spiritual aspects. Also, with the number of productive age in this village, the people can be easily motivated to be aware of the environment. The other factor that made this program successful is the natural resources that this village can use, as their alternative income source.

A.2. Design for sustainability and community is done simultaneously. Each aspect on this program has contribute toward a robust and resilient society, it helps rehabilitating and nurturing the environment and most importantly the program make the people have a deep sense of place and belonging to the Bendungan Village.

A.3. The environment aspect goals in this village, also in many developing countries needs push factors to work, in this village the push factor are economic and spiritual aspects that move the people to save their environment. The economic benefit from garbage bank has made people with low environmental awareness willingly participate in the program.

B. The obstacles to the program in this village are:

B.1. the lack of facilities that they have, and for cadres to teach people about the environment.

B.2. The other obstacle is the lack of the government to provide formal education for the people. The low education level of the people may become future obstacle of this program.

B.3. The last obstacle of this program is the economic factor, low amount of sellable garbage such as PET and cans have become major obstacle in promoting garbage bank.

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