

Six Years Evaluation in Recycling Behaviors After Implementation of Governmental Environmental Awareness Programs (Study Case in Bendungan Village, Indonesia)

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Abstract. Environmental issues like erosion and flooding are primarily brought on by human activity. Human aspects must be considered in formulating environmental solutions because most environmental issues are caused by or stem from human activity. Lack of knowledge, a lack of skills, poor health, and a lack of a strong work ethic are all internal factors that contribute to environmental issues throughout Indonesia, including in Bendungan Village. Additionally, one of the factors contributing to the creation of unintentionally environmentally detrimental conduct is a lack of environmental understanding. Waste is one of the issues in this community; because people are unaware of the implications of their actions, they throw garbage into drains and vacant ground. Improving people's quality of life is one way to solve environmental issues by considering social elements, one of which is through sustainability education and incitement given by the West Java Government. Through this concept, citizens are given education about the impact of their previous behavior, one of them is their behavior related to waste. The program also provides economic value to waste so that there is an incentive to maintain the condition of waste managing waste in their village. In order to gather the data for this study, a mixed methods approach (qualitative and quantitative) was used, as well as a review of secondary data, direct observations, and semi-structured questioning. According to this study, the programs showed positive results shortly after the programs are conducted. After 6 years, the evaluation conducted by this study showed that the programs are failing. 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 to this program is the economic factor, low amount of sellable garbage such as PET and cans have become a major obstacle in promoting garbage bank, thus lead to failing programs, lead to a conclusion that the programs are not sustainable.

Keywords. Waste, Recycle, Sustainability, Community, Garbage, Government Program, Evaluation, Habit

Introduction

Environmentally the issues corresponding to erosion and flooding are primarily brought on by human activity. Therefore, it can be concluded that humans themselves are the primary cause

of environmental problems. Human aspects must be considered in formulating environmental solutions because most environmental issues are caused by or stem from human activity. Lack of knowledge, a lack of skills, poor health, and a lack of a strong work ethic are all internal factors that contribute to environmental issues throughout Indonesia, including in Bendungan Village. The emergence of external causes might also cause internal factors. Low community nutrition is a symptom of poor public health. Low income and restricted access to natural resources are the causes of the undernourished community. Additionally, one of the factors contributing to the creation of unintentionally environmentally detrimental conduct is a lack of environmental understanding. Waste is one of the issues in this community; because individuals are unaware of the implications of their actions, they dump garbage into drains and vacant ground.

The complication of Indonesia's environmental issues is a result of numerous polemics and disagreements among communities, individuals, and organizations. These discrepancies and contradictions can essentially be traced back to the causes of these environmental issues and the solutions to them. The following can be used to summarize the primary causes of Indonesia's environmental issues, according to the World Bank (2010): (1) Global warming and climate change; (2) Management of forests and water flow; (3) Management of disasters; (4) Policies, Institutions, and Operations; and (5) Coastal Resources and Coral Reef Ecosystems.

Because environmental issues in Indonesia are linked to social issues as well, the most recent environmental science solution to solving environmental problems involves the integration and cooperation of many stakeholders. Indonesia has numerous societal issues due to its high population. The majority of community members are impacted by the social issue since it directly compromises societal ideals. The environment got worse as a result of social issues, particularly poverty, and illiteracy. Due to economic deficiency, a lack of familiarity, and also education, people were less concerned with the environment and were less aware of how their actions affected the ecosystem. Building capacity is one approach to addressing environmental issues that involve human components. Because of this, the West Java government start conducting environmental programs for the people in 2017, called Ecovillage programs, one of the villages which the programs are conducted is in Bendungan Village.

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. This study's research methodology is a mixed-methods approach (quantitative and qualitative) (Creswell, 2010¹).

Research Objects and Locations

The village of Bendungan is situated in the 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

¹ J. W., Creswell, & Plano Clark, V.L. (2010). *Designing and conducting mixed methods research* (2nd ed.). Thousand Oaks, CA: Sage.

East Longitude / -6.668112 South Latitude. Officially, this village is bounded by the following villages: Pandansari Village, Sukamahi Village, Sukamahi Village, Banjarwaru Village, and Ciawi.

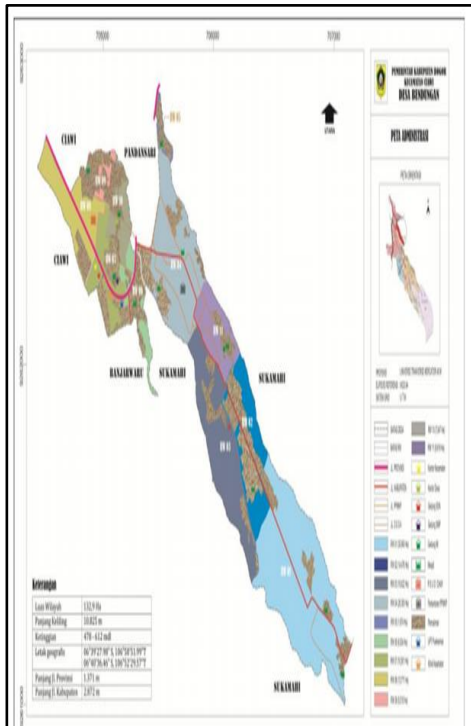


Fig. 1 Ciawi Sub-District Administrative Area
 Source: Documents of the Department of Spatial Planning and Creation.

Literature Review Sustainability

Indonesia complies with the demands of globalization without considering its future prospects to be the same as those of any other nation in the world. Most Indonesian communities are entrenched with erratic and rapid development and consumerist tendencies. Environment destruction and cultural renunciation have resulted from the progress that is merely partial, quick, and motivated by consumptive covetousness (changing into consumptive behavior). Thus, the idea of sustainable development will introduce a fresh discussion regarding the significance of protecting the environment for future generations.

A range of genres of literature and global accords have been characterized as being done "sustainably" in the past. The majority of them agreed that the phrase includes not merely ecology but also human issues including social, cultural, and economic factors.

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”².

² Korten, D. The Great Turning – From Empire to Earth Community. (Kumarian Press, 2006).

According to Korten, current sustainable practices are solely concerned with being "green" and do not address the human race and its systems, which include economic, social, cultural, and spiritual systems, as the primary causes of destruction and potential solutions to this issue.

Evaluation definition

Korporowicz (1997), defines evaluation as a systematic survey of a value or features of the program, activity or an object, taking into account the criteria used to enhance, improve or understand the program better. Evaluation is a study that always use the goal³.

According to Korporowicz (1997), the lack of an objective evaluation will make an evaluation study weak and questionable. One of the most important purposes of evaluation is to provide the reliable data and provability that will allow someone to make a decision.

B.1. Definition of Impact Evaluation according to the World Bank

The question that will be compiled in this study was based on guidelines issued by the World Bank regarding the evaluation of the impact. Therefore, the question of this study will encompass three guiding questions, namely:

1. Descriptive question (to become clear right process of program implementation)
2. Normative question (can be arranged to see whether the targets in the ecovillage program has been reached or not, the question will be prepared to look at the input, process and output for the public execution and environment)
3. The question of causation (research questions will be prepared to know why West Java Province's DLH use this ecovillage program/approach)

Based on three guiding questions above, it can be concluded that the evaluation in this study is limited to knowing the changes that directly caused by the ecovillage program.

Based on the World Bank, impact evaluation should be done if the evaluated program were:

1. Innovative.

The program uses new approach/ approaches. West Java's Ecovillage is an innovative program because it is an innovation in ecovillage approach itself.

2. Replicable.

The program can be copied and used in other areas. The fact that West Java's ecovillage program has been used and emulated in 120 villages is the indication that the program is replicable.

3. Strategically relevant.

This program is a program that involves many people and multi-stakeholder.

4. Untested.

Ecovillage program at the initiative of government in Indonesia has not been tested for its impact, thus eligible for impact evaluation.

5. Influential.

The results of this evaluation can be used for policy-makers.

Impact evaluation of the World Bank which is used in this study is the retrospective evaluation that is conducted after the program is compiled. The retrospective evaluation in this study is using causal inference. Both will be use to find the impact of the program West Java ecovillage program to the Bendungan Village, Ciawi Sub-district, Bogor.

³ Korporowicz L., (ed.) Ewaluacja w edukacji, Oficyna Naukowa, Warsaw 1997

The Success Standards of Impact Evaluation by UNEG (United Nations Evaluation Group)

According to UNEG, ideally, impact evaluation can build a substantial base of existing information, to consider certain issues that can be resolved in the best way.

The impact evaluation is done and can be said to be successful if it can answer the following questions:

- Is the intervention / program make a difference?
- What is the contribution of the program?
- How will the program make a difference?
- If it is successful, is the program / intervention can be applied in other places with similar results?

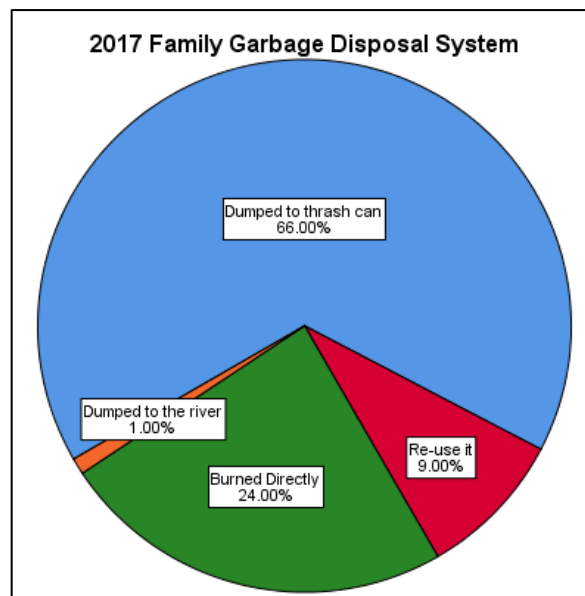
Results

Waste Behavior Related Programs Evaluation Results in 2017

A.1. Family Garbage Disposal System

According to the 2017 surveys, the majority or 66% of individuals in this dumped their garbage to the trash can. Secondly, 24% of respondents burned their garbage directly in their backyard, next 9% reuse some of their garbage, but 1% still dumped their garbage to the river. The outcome is shown in the chart below.

Fig 1. Family Garbage Disposal System



Source: Primary Data, 2017

A.2. Respondents Habit on Separating Garbage in 2017

According to the questionnaire result, although the majority of people or 52% do not separating their garbage, but significant number of people or 48 % of people are separating their garbage. Based on the 2017 interview, the habit on separating garbage is not common in this community, but through education and the government programs, in 2017 many respondents are separating their garbage into recyclable and non-recyclable. The program also introduced the technology

to process their garbage. The important application of technology in the Bendungan Village's ecovillage in West Java is the application of briquettes for fuel that used organic garbage for the material. Garbage is a community problem that occur in every level of society, both on modern and traditional communities.

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. 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 problem of energy materials today is also a discourse for all of us to be resolved soon.

Recently, the world's fuel prices have increased rapidly. This garbage briquettes can be a solution of the problem of handling waste as well as a cheap alternative fuel and does not burden the government. Easy-to-obtain raw materials, easy manufacturing methods and great benefits are an important point in this regard.



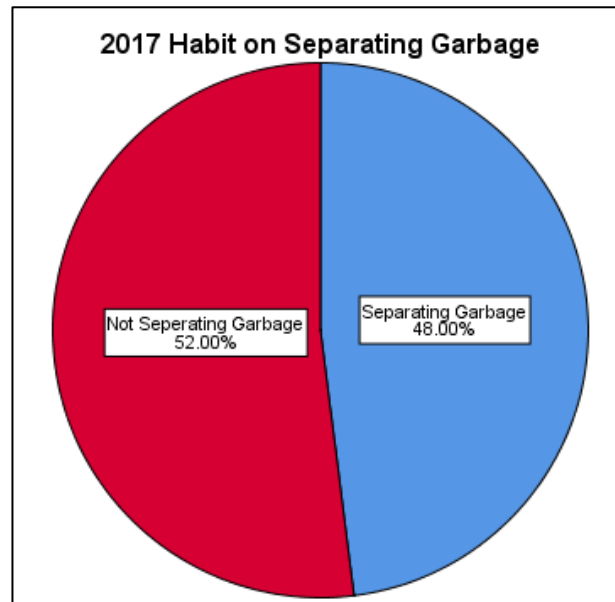
Figure 2. Briquettes and Plastic Blocks Maker as Zero Waste Program in Bendungan Village

Source : Researcher's Documentation, 2017

From the same machine, it is also possible to make plastic blocks for pavement, construction purposes and furniture from all kind of plastic thrash. From this point, the Bendungan village people wanted to make the village become zero waste by utilizing this machine and composting machine.

In the figure below, the outcome of questionnaire is depicted as follows.

Fig 3. Habit on Separating Garbage in 2017

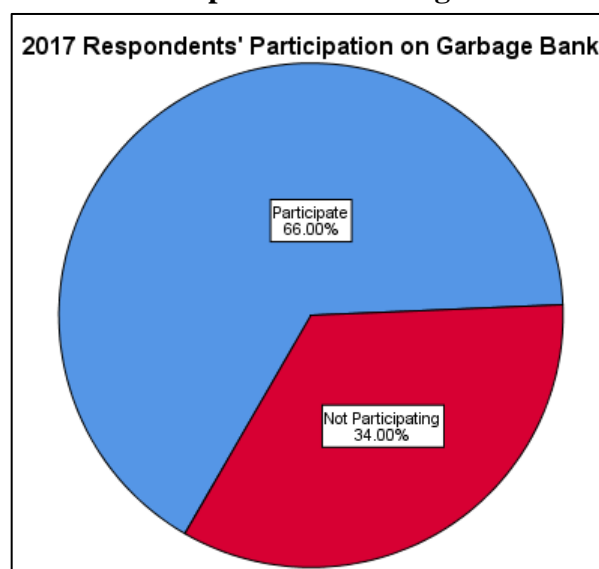


Source: Primary Data, 2017

A.3. Respondents Participation on Garbage Bank Program in 2017

According to the 2017 questionnaire result, 66% of respondents participate on the garbage bank program and only 34% of respondents do not participate. The result is shown on the figure below.

Fig 4. Respondents Participation on Garbage Bank Program in 2017



Source: Primary Data, 2017

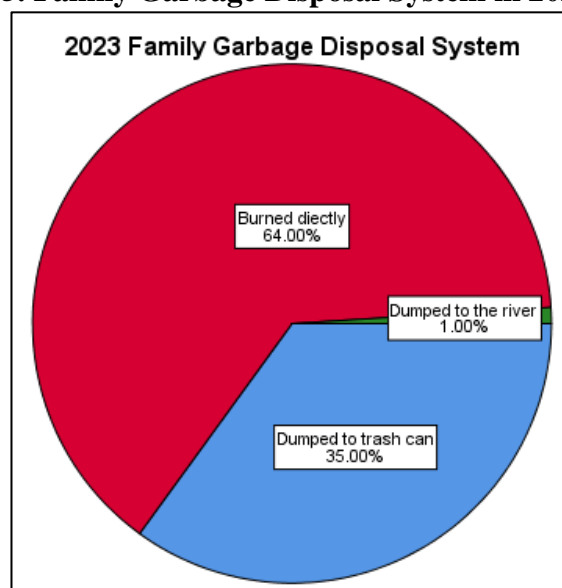
Waste Related Behavior Programs Evaluation Results in 2023 (After 6 years of government’s programs)

In 2023, the questionnaire is spread out using the same questions and methods as the 2017 survey to the same group. The results are as follow.

B.1. Family Garbage Disposal System in 2023

According to the 2023 surveys, the majority or 64% of individuals in this burned their garbage directly. Secondly, 35% of respondents throw their garbage into thrash can, lastly 1 % still dumped their garbage into the river. In the figure below, the outcome is shown.

Fig 5. Family Garbage Disposal System in 2023

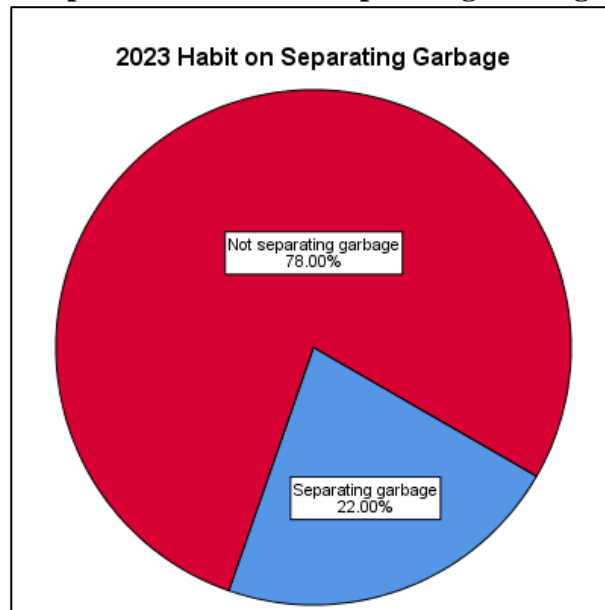


Source: Primary Data, 2023

B.2. Respondents Habit on Separating Garbage in 2023

According to the 2023 questionnaire result, now the majority of people or 78% do not separating their garbage and only small number of people or 22% of people are separating their garbage.

Fig 6. Respondents Habit on Separating Garbage in 2023



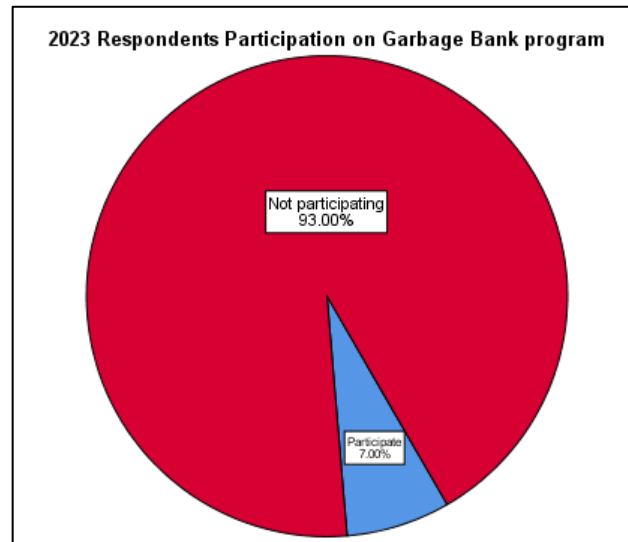
Source: Primary Data, 2023

According to the aforementioned table, 66.7% of the residents of Bendungan Village participate in the garbage bank program. The behavior of people has changed as a result of the waste bank. They now frequently transfer their waste to the bank as well as regularly divide their rubbish into organic and inorganic components. The goal of this move is to get individuals to separate their waste before they dispose of it or distribute it instead of doing it carelessly.

B.3. Respondents Participation on Garbage Bank Program in 2023

According to the 2023 questionnaire result, now 93% of respondents do not participate on the garbage bank program and only 7% of respondents participate. The result is shown on the figure below

Fig 7. Respondents Participation on Garbage Bank Program in 2023



Source: Primary Data, 2023

Discussion

Community perception in the context of waste management after the implementation of government programs in 2017 showed positive results, the programs successfully encourage community behavior in managing waste so that environmental cleanliness can continue to be maintained. Community perception is one of the determinants of the level of community participation because perception is a psychological process that is unique to each individual and functions to form attitudes and determine decisions to act. If the public's perception of waste management is good, then public participation in waste management will increase. Factors that influence people's perceptions originate from within the individual and his relationship with the environment in which he lives. Factors originating from within the individual include age, gender, level of education, employment, income, knowledge, and experience. In this case, what is meant by knowledge is the public's knowledge about managing waste while learning how to process waste at an outreach or existing waste management practices. The program in 2017 has successfully implemented this into the community.

According to UNEG, ideally, impact evaluation can build a substantial base of existing information, to consider certain issues that can be resolved in the best way. Based on 2023 results, 6 years after the implementation of the programs, the results showed that the programs have failed to be a sustainable program.

Conclusions

The community's attitude towards waste management still needs improvement, as seen from the community's response and responsibility for waste sorting, collection, and processing activities that need to be done correctly. The community must still the discipline and orderly collect waste at the available temporary disposal unit according to the specified schedule. There is also no effort from the local government to control collection activities on empty land, and more disposal unit is needed.

In addition, the government's reasonable control and supervision are necessary to foster a positive community attitude toward waste collection. This is because improper infrastructure, such as temporary waste collection area, can hinder waste management practices and actions by preventing the volume of waste from being generated during recycling activities, such as training.

In order to carry out recycling practices, the community needs to be more creative in how it processes its current used garbage, which is why waste handling activities in waste processing have not been carried out to their full potential. Infrastructure recommendations that instruct, train, and even reach out to the community about waste processing are examples of what is needed in order to motivate them to recycle garbage.

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