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# Community behavior study in domestic waste management around the Ciapus River, Babakan Village, Bogor Regency, West Java

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**Abstract.** Community behaviour is one of the dominant factors affecting the sustainability of the watershed. This study aims to identify community behaviour in the management of domestic waste around the Ciapus river in the Cisadane watershed. This research was conducted in the community in Babakan Village. The research method used is a case study. Collecting data with questionnaires, in-depth interviews and FGDs. Determination of respondents with purposive sampling method for 60 people who live around the river. The collected data were analysed and presented descriptively. The results showed that community behavior in managing waste showed that the community had not carried out good waste management as 100% did not separate wet and dry waste and 100% did not separate organic and inorganic waste, 100% did not have separate trash bins, 100% did not use waste plastic, 80% dispose of domestic waste into the river and 20% still dispose of waste in vacant land, 50% still often do garbage burning, 100% are not pleased reprimand people who dispose of garbage into the river, 80% do not know the government regulations that regulate certain distance limits from rivers that are not permitted to be used, 80% do not know that settlements around the river require special permits and 100% do not know whether there is a ban or not from the village government for settlement or economic activities around this river. This behavior has implications for the disruption of the river's sustainability function.

## 1. Introduction

Indonesia has at least 5,590 major rivers spread across the archipelago. Of the main rivers, the Watershed reaches 1,512,466 square kilometers. Data from the Ministry of Environment and Forestry released in September 2016 states that damage to river basins in Indonesia tends to increase from year to year. Of the evaluations of 106 watersheds throughout Indonesia that were prioritized, 52 watersheds experienced heavy pollution and 20 watersheds experienced moderate-to-severe pollution, as well as 7 categorized watersheds that were heavily-polluted. Of the 52 watersheds that have experienced heavy pollutants, 11 of them are in Java with 3 medium-heavy polluted watersheds, namely Ciliwing, Cisadane, Bengawan Solo Watersheds [1]. The river is a source of life for humans and is the biggest contributor of water to the needs of living things, and has many benefits that can be obtained in river management [2]. Its existence needs to be preserved, especially in rivers that pass through residential areas [3]. Efforts to improve the quality of the river environment have been carried out by most regional and municipal governments in Indonesia, which cover various aspects, including



waste management in river banks [4]. [5] stated that the preservation of river functions as a resource for life, especially in dealing with waste problems, requires the involvement of all relevant stakeholders. Therefore, [6] explained that coordination, cooperation and consultation among stakeholders for each policy related to the river was needed.

The neighborhood of the settlements in the river border often looks slum, because it is used as a waste dump by the local community [7]. Waste has become a major problem faced by almost all urban areas in Indonesia. [8] States that the cleanliness of the community environment is one measure of the quality of life of the community. According to [9] communities around the upper reaches of the Cisadane watershed tend to have low levels of education and income, and have very little knowledge about the functions and roles of the watershed. [10] explain the implications that the community feels watershed is a public good so that it can be accessed freely for various purposes, such as bathing, washing, household waste disposal sites, and landfills; As a result, its sustainability is disrupted.

Research into the behavior of people in removing garbage on the banks of the river has been done quite a lot [11]; [12]; [13]. However, the research is different from previous studies where this research is focused on the behavior of the people in the upstream watershed, especially in managing domestic waste because the behavior of the people in the upstream watershed will have an influence on the existence of watershed functions in the upstream and even downstream.

Community behaviour in the management of domestic waste is one of the main factors that influence the sustainability of the river because this behaviour will have an impact on the sustainability of the overall watershed function [14]; [15]; [16]; [17]; [18]. In this regard, this research is important to do to identify the behaviour of people living in river banks in managing domestic waste. Knowledge and understanding gained will be beneficial for the parties involved in making policies for the community in the river border in managing waste so that the sustainability of river functions is maintained.

## **2. Materials and Methods**

### *2.1. Research time and location*

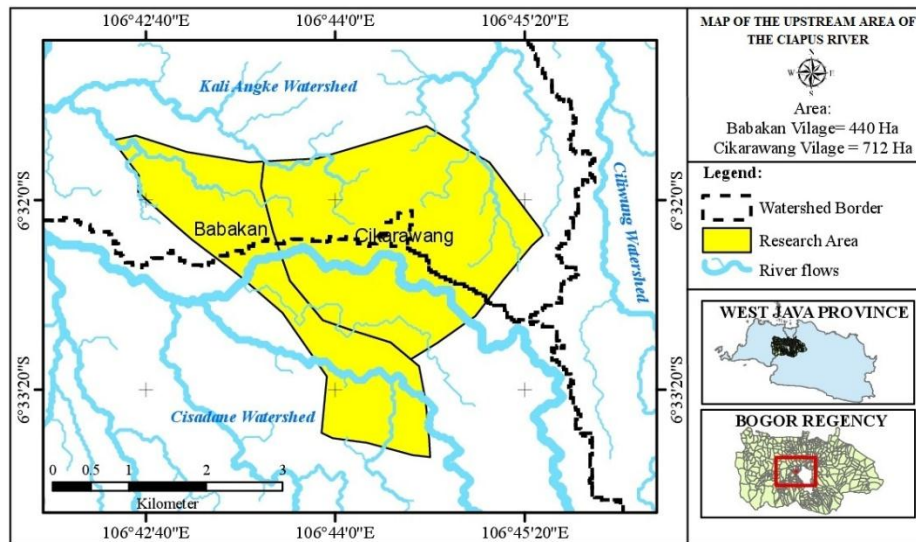
This research was conducted from March to April 2018 on the upper Cisadane river, especially in Babakan Village, Bogor Regency. The object of this research is the Cisadane upstream river area and the people living in the river border. Babakan Village was chosen because it is an area in the upstream area of the Cisadane watershed that has a dense population living in river banks. The location of the study can be seen in figure 1.

### *2.2. Data collection*

The sampling method is random sampling with the age range of the community between 18-60 years. The number of samples is 60 people representing whose dominant communities reside in the river border. Data collection methods used were interviews, observation and literature studies. This research is qualitative. Namely, the research used to understand the phenomenon of what is experienced by research subjects, especially aspects of community behavior in a holistic manner, and by way of descriptions in the form of words and languages. His analysis approach is descriptive to collect information about the status of a symptom that is done, not intended to measure certain hypotheses, but only describe what it is about variables, symptoms, and circumstances.

### *2.3. Data processing*

The answers obtained are accumulated by calculating the percentage of total answers per respondents categorized in 3 categories of choices, i.e. the yes answer to do, sometimes done and not done.



**Figure 1.** Map of research location

### 3. Results and Discussion

#### 3.1. Overview of research location

Geographically, the Cisadane watershed is located in the coordinates of  $106^{\circ} 28' 53''$  -  $106^{\circ} 56' 42''$  BT and  $6^{\circ} 00' 14''$  -  $6^{\circ} 47' 17''$  LS with a total area of 153,208.91 ha. The Cisadane Watershed is a cross-province watershed, which is administratively located in West Java and Banten Provinces and a small part of the downstream area is included in the DKI Jakarta Province. Most of the Cisadane watershed is in West Java Province with an area of 113,535.66 ha (74.11%), the rest in Banten Province covering an area of 39,500.64 ha (25.78%) and DKI Jakarta Province 172.61 ha (0.11%). The Cisadane watershed has less than 20% of the forest area, which is 28,098.79 ha (18.34%). In the upper reaches of the Cisadane watershed, there are Gunung Gede Pangrango National Park and Gunung Halimun Salak National Park. The topography of the area is generally flat to steep, which is generally flat. Flat topography dominates the area, which is 50% and the slope occupies the second place, 41%, there is no area with slopes of more than 40% or very steep. The altitude varies from 214 m asl to 520 m, and most of the area has an average height of around 260 m asl [19].

Babakan Village is a village located right around the Cisadane River upstream and Ciapus River from the Cisadane River Basin. Geographically, Babakan Village is located at an altitude of 400 m above sea level, with rainfall of 4,561 mm/year. The average air temperature ranges from  $25^{\circ} \text{C}$  -  $33^{\circ} \text{C}$ . Ecologically, the existence of the upstream Cisadane sub-watershed supports the balance of ecosystems so that in this region there are many abundant natural resources, including forest and wildlife resources, and so on. All land and water resources provide economic benefits and various daily necessities for residents who inhabit the watershed area.

#### 3.2. Community participation

The Cisadane Watershed has been designated as one of 26 priority watersheds in Indonesia as listed in the 2015-2019 Strategic Plan of the Ministry of Environment and Forestry [20]. As one of the priority watersheds, the management of the upstream watershed aims to maintain the quality and capacity of

water resources. The role of the community around the watershed area becomes important to maintain the sustainability of this watershed function. At present, land use and management in the Cisadane watershed, especially in the Ciapus sub-watershed, has undergone significant changes. The utilisation and management are not only limited to the agricultural sector but also develops for industrial needs and especially for settlements.

In Babakan village almost 60% of the people live on the border of the Ciapus river. The existence of this community certainly has implications for the management of natural resources around the watershed. The community uses the potential of the watershed by building settlements along the river. The economic activities of small businesses and households have a major influence on the sustainability of watersheds, especially the management of the business and household waste. Observations show that most household waste is dumped into rivers. Economic activities such as chicken slaughter and motorbike washing service business were carried out by several residents. Also, because of the condition of groundwater, which is often difficult to obtain in the dry season, people use the bathing and washing activities in the river.

### 3.3. Improvement of waste management in the Ciapur River

Community behaviour in domestic waste management activities can be seen in table 1.

**Table 1.** Community Behavior in Domestic Waste Management

Activity	Respond		
	Yes (%)	Sometimes(%)	Don't do It (%)
Do you separate dry and wet domestic waste ?	0	0	100
Do you separate between organic and inorganic waste ?	0	0	100
Do you have separate bins at house?	0	0	100
Do you use plastic waste economically?	0	0	100
Do you throw domestic waste into the river riparian or directly into the river?	80	10	10
Do you dispose of domestic waste beside the available house/ vacant land?	20	5	75
Is it still burning domestic waste that has accumulated?	50	25	25
Do you want to reprimand people who throw their domestic waste into the river?	0	0	100
Are you aware of government regulations that regulate certain distance limits from rivers and rivers that are not allowed to be used?	5	15	80
Do business activities/ settlements around this river and require special permission?	10	10	80
To your knowledge, is there a ban on the village government for small-scale settlement or economic activities around this river?	0	0	100

For domestic waste sorting and disposal activities, ask 100% of the community not to divert between dry waste and wet waste. Related to what was conveyed by [21] which diverts the causes of waste activities cannot be carried out by the community because awareness and concern of the community to manage waste is still lacking and weak government policies so that activities to improve the type of waste are hampered. The same thing happened for organic and organic waste settlement

activities, 100% of the community had not implemented it and were aware of the importance of the activities carried out.

The community also does not have a separate trash can at home. 100% of the community does not yet have the knowledge of the importance of having separate bins. As explained by [22] that handling household waste cannot only be the responsibility of the government, but ideally the problem of waste management is also the responsibility of the community itself as a waste producer. In line with what was conveyed by [23] that, the availability of waste (media) indirectly gives a message to the community to dispose of domestic waste in its place so that the environment becomes clean and free from disease.

For people to use plastic waste economically, it hasn't been done, 75% of the people don't know how to use plastic waste. Plastic has become a part of our lives. In line with what stated by [24] that every day, we always use products that contain plastic. The amount of plastic we use certainly produces abundant waste. Plastics are creative products where their creations have promising commercial value. This product has a selling power that can generate profits. The community needs to be given empowerment activities in the form of training in the use of waste so that it can help the family economy and environmental sustainability. Increasing people's understanding of waste management and waste hazards will create a good attitude towards waste management and correct behavior will be formed in implementing waste management, to create a clean, healthy and pollution-free environment [25]. Furthermore [26] revealed that so far, community involvement in reducing plastic use and recycling is still very minimal.

For activities to dispose of domestic waste to the border or into the river, it was found that 80% of the people were still actively doing it. Unconsciously, the behavior of littering will become a form of behavior that is internalized in the mind that littering is not wrong [27]. This behavior is certainly very unfortunate.

The activities of people who dispose of domestic waste in vacant land are still carried out by 20% of the community while 75% of the people do not do this activity because they do not want the surrounding environment to be polluted with the smell of household waste. The 5% are still doing both of these things are thrown into empty land or just burned if they have piled up. For this reason, it is necessary to have a well-organized waste management effort (there is a waste management group and landfill that is available and easily accessible). In the village of Babakan, there were officers who specifically collected residents' garbage but did not walk anymore. So that waste management was carried out by each individual. This is in line with Putra's view, 2016 that most people dispose of their daily garbage by throwing garbage into rivers or empty land due to garbage disposal facilities that are still not available and also because it has become a habit. Furthermore [28] explained that one solution is to determine the location of the landfill that provides easy access for the community to the disposal location. In the village of Babakan, the temporary waste disposal site is also far away. For this reason, in order to obtain a good and right attitude towards the behavior of disposing of garbage, it is necessary to provide information or counseling routinely about waste management and the dangers of waste to health and the environment. Increasing people's understanding of waste management and the dangers of waste, will create a good attitude towards waste management and the right behavior will be formed in carrying out waste management, so as to create a clean, healthy and free environment from pollution. [29]. Fifty percent of the community is still carrying out garbage burning activities, the community does this on the grounds that they do not like to see domestic waste piled up. And the tendency to burn waste because they do not understand the effects of air pollution caused by burning waste. as stated by [30] the community considers burning waste as part of waste management and does not realize that this can cause pollution to the environment and disrupt health. This attitude is likely influenced by his knowledge and maturity of age.

Reprimanding others who are still littering, is a behavior that is greatly avoided by the community. 100% of people are reluctant to do this because they are afraid that they will interfere with their relations. And expect better village officials or community leaders to reprimand. As explained by [31] that the attitude of the community in garbage disposal is the main form of community behavior, where

the community receives information on waste disposal positively by accepting suggestions given by officers or local community leaders even though it is not yet in action.

The public does not yet know well the government regulations, namely Presidential Decree No. 32 of 1990 concerning Protected Areas that the criteria for river border are at least 100 meters on either side of a large river and 50 meters on the left and right side of the river which is outside the settlement and is not permitted to be used. 80% of the people stated that they did not know this regulation. This has implications for the development of settlements along the river, which of course will result in delays in river flow due to a large amount of domestic waste discharged into river bodies resulting in reduced river capacity to drain incoming water due to high rainfall in the upstream area. The observation results in the village of Babakan, the existence of settlements and community activities did not meet the criteria for the border. The distance of buildings and river borderlines is generally only around 5-25 meters. Even though the border area has an important function because it covers the border area of the river, which is part of the river body which is only flooded in the rainy season and the border area which is outside the border is an area that holds river overflowing in the rainy season and has higher soil moisture than moisture land in the land ecosystem. For this reason, it is necessary to make a settlement arrangement in the river border area.

The community's knowledge not to allow small business activities around this river needs to be improved. 100% of the people did not know about this prohibition so that various small businesses developed rapidly along river riparian around Babakan village. Communities need information not only information that is good about the potential of resources around the river but emphasizes information that can encourage people to change behavior [32]. Community behavior is an action and human nature in land use. This action and behavior is caused by human needs and desires to apply both in social life in the environment and in fulfilling economic desires. The needs and desires that apply in human life will give an influence on the values contained in aspects of life.

The village government does not prohibit settlement or business activities around the river. 100% of the community does not know whether there is a village government prohibition for settlement or economic activities around this river. Dense settlements along the river tend to cause delays in river flow because a large amount of domestic waste is discharged into river bodies resulting in reduced river capacity to drain incoming water due to high rainfall in the upstream area. As an environment, rivers naturally offer various possibilities for human use. People naturally tend to exploit the potential that exists in rivers for their benefit. In line with what [33], said that motivation is the main guide behind behavior. This is what explains the emergence of various uses of the river based on the needs that must be met. On a more macro scale, the most basic human needs are physiological needs, which encourage people to have a place to live which then leads to settlements around the watershed boundaries. For this reason, the role of the government and various stakeholders is needed to be able to organize the behavior of the surrounding communities especially in managing waste and contribute to the sustainability of the function and role of the river [34]; [35].

Domestic waste management requires the active participation of individuals and community groups so that the role of the government is not getting heavier. Increasing community participation in waste management, can be carried out by involving the community as the biggest waste producer, by cultivating the behavior of waste management since the early stages of the household, as the lowest structure in waste management.

#### **4. Conclusion and Recommendation**

Community behavior in managing waste shows that the community has not done good waste management. The results showed that community behavior in managing waste showed that the community had not carried out good waste management as 100% did not separate wet and dry waste and 100% did not separate organic and inorganic waste, 100% did not have separate trash bins, 100% did not use waste plastic, 80% dispose of domestic waste into the river and 20% still dispose of waste in vacant land, 50% still often do garbage burning, 100% are not pleased reprimand people who

dispose of garbage into the river, 80% do not know the government regulations that regulate certain distance limits from rivers that are not permitted to be used, 80% do not know that settlements around the river require special permits and 100% do not know whether there is a ban or not from the village government for settlement or economic activities around this river. This behavior has implications for the disruption of the river's sustainability function.

The river is a source of life for humans and is the largest contributor of water to the needs of living things, and has many benefits that can be obtained in river management. Its existence needs to be preserved. The Cisadane watershed has experienced increased pollution from year to year. Community behavior in managing household waste is one of the main factors that influence it. To increase the effectiveness of the management of sustainable Cisadane watershed, it is necessary to accelerate the recovery of the ecological conditions of the watershed. Efforts can be made between increasing knowledge through counseling and outreach about the functions and roles of watersheds, increasing the active role of the community in applying the concept of soil and water conservation, increasing the capacity of human resources around the watershed, and involving various stakeholders to collaborate in the management of watersheds.

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