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Overview Of Environmental Conditions That Have The Potential To Become A Breeding Place For Mosquitoes That Cause Dengue Hemorrhagic Fever (Dhf) In Cikulak Village, Cirebon Regency

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Abstract

Mosquitoes are a vector of disease that plays a role in the spread of various infectious diseases, such as dengue fever (DHF), malaria, chikungunya, and filariasis. Environmental conditions such as stagnant water, open water reservoirs, and garbage accumulation can serve as breeding grounds for mosquitoes and increase the risk of disease transmission. This study aims to identify environmental conditions that have the potential to become mosquito breeding grounds in Cikulak Village, Cirebon Regency. The study used a descriptive observational design with a cross-sectional approach and was conducted in Cikulak Village, Cirebon Regency, from February to March 2026. The results revealed the presence of rarely cleaned bathtubs containing mosquito larvae, used containers that collect rainwater, stagnant water around houses, and garbage accumulation in residential areas. These conditions have the potential to become mosquito breeding grounds. Therefore, the environmental conditions in Cikulak Village still have the potential to become mosquito breeding grounds, requiring environmental management efforts and increased public awareness to prevent mosquito breeding.

Keywords: ***Mosquitoes, Mosquito Breeding Grounds, Mosquito Larvae, Household Environment, Settlements, Waste***

INTRODUCTION

Mosquitoes are vectors that play a role in the spread of various infectious diseases, such as dengue fever (DHF). This mosquito-borne disease remains a public health challenge in many tropical countries, particularly the Aedes aegypti mosquito (Sabir, 2021; WHO 2024). Globally, DHF remains a significant health problem, placing a heavy burden on health systems in many countries (Zhang WX, 2025). A World Health Organization (WHO) report notes that approximately 390 million dengue infections occur annually, with approximately 96 million of these showing obvious symptoms. Furthermore, an estimated 5.6 billion people worldwide are at risk of contracting dengue, which is transmitted by mosquitoes (WHO, 2025).

In Indonesia, mosquito-borne health problems remain a major concern. According to data from the Indonesian Ministry of Health, mosquito-borne diseases are reported annually in almost all regions of Indonesia, making mosquito vector control a challenge in preventing environmental diseases (Indonesian Ministry of Health, 2022). As a tropical country, Indonesia faces a high risk of mosquito-borne diseases, particularly dengue fever (Martini M, et al., 2023). Data from the Indonesian Ministry of Health shows that dengue fever incidents continue to increase significantly each year. In 2023, there were 114,720 reported dengue cases with 894 deaths, and in 2024, this number increased to approximately 210,644 cases across 259 districts/cities in 32 provinces in Indonesia (Indonesian Ministry of Health, 2024).

According to data from the West Java Province Open Data Center, the number of dengue fever (DHF) cases in West Java province remained relatively high in 2024. A total of 61,414 dengue fever cases were recorded across 18 regencies and 9 cities in West Java (Open Data Jabar, 2024). Furthermore, Cirebon Regency is one of the regions in West Java with a significant dengue epidemiological burden, marked by the declaration of Extraordinary Event Alert (KLB) status in 2025.

Data shows that by the 31st week of 2025, 786 dengue fever cases, with two deaths, were recorded in Cirebon Regency (Pratiwi, W & Rachmawan, YP, 2025). Furthermore, based on data from the Cirebon Health Profile, the number of dengue fever cases in Cikulak Village accumulated in the Cibogo Community Health Center (Puskesmas) totaled 24 individuals, consisting of 16 men and 8 women (Cirebon Health Profile, 2023).

Mosquito breeding grounds are significantly influenced by the conditions surrounding residential areas, particularly the presence of standing water in various containers, both natural and artificial. Containers such as bathtubs, buckets, water storage drums, plant pots, and trash that collect rainwater often become perfect breeding grounds for mosquitoes. Furthermore, poor environmental sanitation, dysfunctional drainage, and the way people store water can also increase the likelihood of mosquito larval habitats. Residential environments with numerous water-filled containers tend to have a higher risk of becoming breeding grounds for mosquitoes, especially Aedes, which typically breed in water reservoirs around homes (Ministry of Health of the Republic of Indonesia, 2020; Erlanger, 2021).

Cikulak Village, located in Cirebon Regency, is a residential area with environmental characteristics that can support the emergence of mosquito breeding sites. This is due to the presence of water storage containers in households and the potential for stagnant water in the surrounding area. This situation can increase the likelihood of mosquito population growth if not properly managed. Therefore, it is important to take steps to identify potential mosquito breeding sites within the community.

Various studies (Ismayanti G et al., 2025) have shown that environmental factors such as home cleanliness, access to water, and environmental cleanliness are associated with dengue fever incidence. The presence of breeding sites is also an important factor that can increase the number of Aedes mosquitoes and increase the likelihood of disease spread. However, most studies focus more on the relationship between risk factors and disease incidence or macro factors such as weather, while research on microenvironmental conditions that may function as mosquito breeding sites is still very limited. Furthermore, several mosquito breeding sites are often overlooked in environmental surveys. Studies that specifically examine environmental conditions that have the potential to serve as mosquito breeding sites at the village level, especially in Cirebon Regency, are also still rare. Therefore, this study aims to identify potential mosquito breeding sites based on environmental conditions in Village C.

RESEARCH METHODS

This study was a descriptive observational study using a cross-sectional approach. The study was conducted from February to March 2026 during the Thematic Community Service Program (KKN-T) in Cikulak Village, Cirebon Regency.

The population in this study was the entire residential area in Cikulak Village. Observation units were selected using purposive sampling, including homes with a history of dengue fever cases. The sample for this study was two homes with previous dengue fever cases and the surrounding area of the observed homes.

Data collection was conducted using observation sheets. Primary data collection was conducted through direct interviews with homeowners who had family members with a history of dengue fever. Interviews used questions to obtain information about the condition of the home environment, the presence of water reservoirs, community habits regarding environmental hygiene, water reservoir management, and efforts to prevent mosquito breeding in the home environment.

The data obtained were analyzed descriptively, presenting the results in the form of frequency distributions and percentages to illustrate environmental conditions that have the potential to become mosquito breeding sites. The results are then explained narratively to provide an interpretation of the findings in the Cikulak Village area, Cirebon Regency.

RESULTS AND DISCUSSION

Based on observations conducted in Cikulak Village, Cirebon Regency, several household and surrounding environmental conditions were identified that could potentially serve as mosquito breeding grounds. Observations were conducted in residents' homes and the surrounding neighborhoods. Several containers were found around the homes that could potentially serve as water reservoirs, such as used buckets and paint containers located around the yards. Some of these containers were open, allowing rainwater to collect and form puddles. Open water reservoirs allow mosquitoes to lay eggs and develop into larvae (Wathon S, 2025).

Aedes mosquitoes are known to breed more frequently in areas that can hold water for long periods of time, especially in water reservoirs located around homes (World Health Organization, 2023). This finding also aligns with studies showing that human-made containers such as cans, plastic, and containers are common breeding grounds for Aedes mosquito larvae in the home environment (Erlanger 2021).

In several homes located near gardens, garbage accumulations were found, creating a damp environment and increasing mosquito populations. Furthermore, lush vegetation in garden areas can provide suitable places for mosquitoes to rest and breed. Trash around gardens also has the potential to collect rainwater, which can become a breeding ground for mosquito larvae. Environments with abundant vegetation and high humidity levels are known to support mosquito populations in residential areas (Centers for Disease Control and Prevention, 2022). Therefore, environmental management, such as cleaning up trash and maintaining the cleanliness of the area around the house, is necessary to reduce the potential for mosquito breeding.

In addition to the outdoor environment, observations also showed the presence of mosquito larvae in bathtubs inside residents' homes. The presence of these larvae indicates that these water reservoirs have become breeding grounds for mosquitoes. Furthermore, a layer of dirt was observed on the walls of the bathtubs, indicating that they are rarely cleaned regularly. This allows water to accumulate over long periods of time, creating ideal breeding grounds for mosquitoes to lay eggs and develop into larvae. Previous research has shown that water reservoirs in homes, such as bathtubs, are among the most common breeding sites for Aedes aegypti, especially if they are not cleaned regularly (Waewwab, 2020). Therefore, the habit of regularly cleaning and draining water reservoirs is an important step in preventing the breeding of mosquito larvae in the home environment.

Figure 1. Condition of the Bathtub

Figure 2. A bathtub with visible mosquito larvae

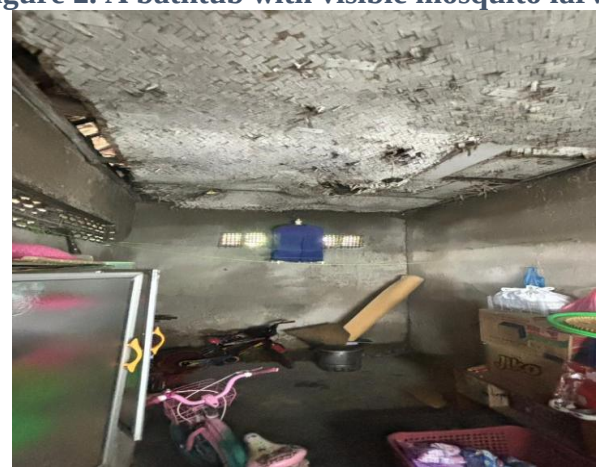

Figure 3. Condition of the house walls

Figure 4. Water pooling in a used container

Furthermore, piles of poorly managed household waste were also found in residential areas. This waste consists of various types, such as plastic, bottles, and cans, which have the potential to collect rainwater (World Health Organization 2023). The presence of this waste can increase the risk of mosquito breeding sites if not managed properly.

In areas around rivers, community waste dumping sites have been found. Accumulated waste around rivers can cause puddles to form in various used containers located there. This creates an environment conducive to mosquito breeding (Ministry of Health of the Republic of Indonesia, 2017).

Figure 5. Piles of rubbish around residential areas

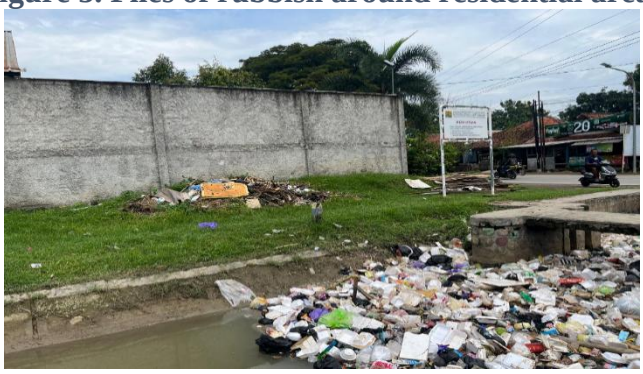

Figure 6. Garbage disposal around the river flow

The presence of stagnant water in used containers and water reservoirs in homes is a crucial factor supporting the mosquito life cycle. Dengue mosquitoes generally breed in places that can hold clean water or rainwater, such as bathtubs, buckets, cans, and various uncovered containers. Mosquito eggs on the surface of the water can develop into larvae or larvae within a few days before finally becoming adult mosquitoes (J.M. Manel K. Herath et al., 2024).

The discovery of larvae in water reservoirs indicates that the household environment can act as a mosquito breeding ground if environmental hygiene is not optimally managed. Various types of water reservoirs in households are known to harbor Aedes aegypti larvae, the vector of dengue fever (Sutriyawan & Lolan, 2023). Furthermore, the presence of trash and used containers in residential areas can also provide suitable breeding grounds for mosquitoes (Agustina & Emil, 2024).

Therefore, controlling environmentally-based diseases like Dengue Fever requires efforts to improve environmental conditions. This can be done by regularly cleaning the environment, draining water reservoirs, covering containers that can hold water, and properly managing waste to prevent stagnant water that can become a breeding ground for mosquitoes.

CONCLUSIONS

Based on observations conducted in Cikulak Village, Cirebon Regency, several environmental conditions were identified that could potentially become mosquito breeding sites, both inside and around residents' homes. This potential includes the presence of uncovered water reservoirs such as bathtubs, buckets, and used containers that collect rainwater, as well as the discovery of mosquito larvae in several water reservoirs. Furthermore, poorly managed household waste, including trash around residential areas and around rivers, also contributes to the growth of mosquito larvae. These environmental conditions demonstrate that cleanliness and environmental management play a crucial role in preventing the formation of mosquito breeding sites. Therefore, efforts such as routine environmental cleaning, draining and covering air reservoirs, and proper waste management are necessary to prevent mosquito-borne diseases.

Preventive efforts can be implemented by increasing public awareness of maintaining environmental cleanliness by implementing the 3M movement (draining, covering, and burying): regularly draining water reservoirs, covering containers that can hold water, and properly managing waste by burying them to prevent them from becoming mosquito breeding sites.

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