



USAID
FROM THE AMERICAN PEOPLE



BUILDING HEALTHY CITIES



COMMUNITY-BASED WASTE AND WATER MANAGEMENT STUDY: MAKASSAR, INDONESIA

Executive Summary

The United States Agency for International Development (USAID)-funded Building Healthy Cities (BHC) project partnered with Makassar Smart City, Bappeda, and the Mayor's Office to improve healthy urban planning in Makassar, Indonesia from 2018-2022. As part of this relationship, BHC completed a participatory study to map waste and water management in one flood-prone neighborhood, Maccini Sombala. The goal was to understand household behaviors and gaps in the community waste management service system, place these issues within the larger community ecosystem to better understand how these behaviors influence wastewater and human (including maternal and child) health, and then document acceptable solutions.

This study was completed in partnership with Lembaga Studi Kebijakan Publik (Institute for Public Policy Studies, LSKP) and has empowered the community to report their needs related to waste and water management, and create data for decision-making related to these issues.

Methods

This study team used a mixed methods, participatory research approach that included four streams of data collected in January 2022 from nine *rukun warga* (RWs) within Maccini Sombala village. The data were collected via social mapping, focus group discussion, household survey, and a household waste audit. Preliminary results were presented to residents in the RWs in June 2022 via data walks, and the feedback provided by the community was documented and synthesized into the final results. Community feedback also drove the interpretation and recommendations provided in the final report. This study was reviewed and approved by the JSI Institutional Review Board.

Results

The objectives and results of the study were broken down into the following research questions:

1. What is the current situation regarding waste in Maccini Sombala village?

Based on a household waste audit, this study identified food (organic) waste as the largest contributor to waste (55 percent), followed by recyclables (23 percent), plastics (16 percent), metal (4 percent) and e-waste (2 percent). Looking at the survey results, respondents had high levels of understanding of general waste hygiene topics but lower levels of understanding of concepts related to recycling and reuse.

Disposal of household waste was managed by various methods depending on the location of the home area. Door-to-door garbage collection and disposal in waste containers were the most common. From the survey, approximately 88 percent of households said they had some form of garbage collection service available in their area and 79 percent said they used that service. Of those, 89 percent said they were satisfied with the services. Of those not satisfied, punctuality was the primary concern. Remaining waste was considered unmanaged.

2. What is the current situation regarding water in Maccini Sombala village?

The survey provided details about the state of water in Maccini Sombala village. Piped water was the primary source of water on a daily basis but 25 percent of people reported also relying on bottled water. This generates a considerable volume of plastic waste. While 97 percent of respondents said they had drinkable water in the last month, 62 percent said they had treated their water before drinking. One quarter of respondents reported that they were not fully satisfied with their current water services, mentioning poor taste and smell, limited access hours, high costs, and sickness from drinking the water as common problems.

In terms of wastewater, 98 percent of households surveyed had a toilet of some sort. The most common sewage management system was open drains, followed by closed drains, then plastic bag disposal, and garbage disposal. Some areas of Maccini Sombala village experienced regular flooding every year, especially in the rainy season. Flooding was partly due to poor drainage and sewer management and residents reported that ditches near their homes were often narrow and clogged.

This issue was exacerbated by delayed or incomplete cleaning of sewage systems. During data walks, several residents explained that it was hard to clean most of the permanently closed drains as they were difficult to access. Half of respondents (49 percent) also reported that there were visible blockages or buildup of solid waste in the drains nearest their homes. While 60 percent reported that this was a nuisance, 37 percent reported that their primary concern with the poorly functioning drains was the risk of their home flooding.



3. How is poor waste and water management affecting human health?

Survey results showed that 32 percent of respondents reported suffering from digestive tract diseases, 16 percent from respiratory issues, 22 percent from skin diseases, and 3 percent from dengue fever.

Of those who said they had experienced any of these conditions, it appeared that skin diseases were most likely to occur during floods (41 percent). Households with children had no statistically increased risk of a family member having any of the four health conditions, but incidence of diarrheal disease during a flood was higher for households with young children (25 percent) versus those without (17 percent).

Residents had good general knowledge of the interactions between waste, wastewater, and health, but with a few exceptions. During data walks, residents assumed that most in their communities were used to interacting with sewage (liquid waste), especially during floods. Some residents said that skin diseases were one of the most common impacts from sewage during rains and floods, but that they were not considered serious illnesses.

Most respondents reported they could afford to go to a health care facility, and nearly all (95 percent) said they felt they had easy access to a health facility. Ninety percent were either satisfied or very satisfied with their health facilities. Despite high reported levels of affordability and accessibility, 12 percent had no health insurance.

4. What do residents identify as possible solutions to these issues? What elements of a waste-resilient or more circular waste system would be acceptable and sustainable for the Maccini Sombala village?

Several themes point to how waste and wastewater management can be improved in Maccini Sombala village. Residents suggested these solutions during the social mapping, focus group discussions, and data walks. BHC facilitators helped to probe further on aspects relating to resiliency, acceptability, and sustainability, as well as options to increase the circular economy for waste. Details are provided in the full report, but the solutions that emerged were:

- improving regular waste collection
- reviving community waste banks
- changing sewer drain design
- greater posyandu (integrated health service post) support
- reusing food waste for urban farming
- improving access to drinking water
- 3rs (reduce, reuse, recycle) education campaigns.

Discussion

The participatory aspects of this study provided community members the opportunity to engage in study design, data collection, and data analysis. Residents, especially women, participated throughout the study process and provided insights about how to work with local customs and elicit information on challenges faced at the household level.



Residents expressed appreciation for this study approach, including how results were shared. One resident said:

"This study made us aware of the various weaknesses of waste management in our area. For that, we really hope that the results of this study can be followed up with programs that can help us solve the problem of waste management in our village." – MU, resident of RW 8 and data walk participant

Another resident expressed that:

"LSKP has become part of our family in this area. We really hope that this study activity does not end here. We will always be willing to help and cooperate for programs that help us solve waste problems and also the economic problems of our residents who are partly large is from the lower middle economy." – R, resident of RW 2 and data walk participant

In 2021, garbage bins with different colors were created to help people sort their waste appropriately. Further expansion of city initiatives is needed, and we hope that suggested solutions identified by Maccini Sombala village residents will be considered in the design of new initiatives. In particular, support for revival and expansion of community waste banks appears vital to improve waste management in Makassar.

While the study was carried out with a high level of adherence to the protocol, we did face some limitations and had to adjust the work to fit the local context. These limitations included variations in engagement across RWs, cultural sensitivity about talking about waste in the household, and suggested solutions ranging outside of the field of the study themes. The study team was able to adapt to all of these limitations to ensure quality of research results.

Based on the results of this study, Smart City Makassar, the Mayor's Office, and other key city organizations now have useful citizen-led feedback about ways to reduce waste and flooding and create sustainable, circular economies for waste in Maccini Sombala village and similar neighborhoods across the city. It is our hope that all parties will work together to integrate these suggested solutions into future work.

JSI RESEARCH & TRAINING INSTITUTE, INC.

2733 Crystal Drive
4th Floor
Arlington, VA 22202
USA
Phone: 703-528-7474
Fax: 703-528-748

INTERNATIONAL ORGANIZATION FOR MIGRATION

Menara Bosowa 10th Floor,
Jl. Jend Sudirman, No. 5,
Makassar, South Sulawesi, 90115
Indonesia
Tel: +624113681200
Fax: +624113681203

Building Healthy Cities (BHC) is a five-year cooperative agreement funded by the United States Agency for International Development (USAID) under Agreement No. AID-OAA-A-17-00028, beginning September 30, 2017. BHC is implemented by JSI Research & Training Institute, Inc. (JSI) with partners International Organization for Migration, Thrive Networks Global, and Urban Institute, and with support from Engaging Inquiry, LLC.

This report is made possible by the generous support of the American people through USAID. The contents are the responsibility of BHC and do not necessarily reflect the views of USAID or the United States Government.

