THE REPUBLIC OF KOSOVO
MINISTRY OF ENVIRONMENT AND SPATIAL PLANNING AND INFRASTRUCTURE
MALISHEVA MUNICIPALITY, SUHAREKA MUNICIPALITY, RAHOVEC MUNICIPALITY, DRAGASH MUNICIPALITY

THE PROJECT FOR ENHANCEMENT OF CAPACITY FOR WASTE MANAGEMENT TOWARD SOUND MATERIAL-CYCLE SOCIETY PHASE 2

Project Completion Report

July 2024

Japan International Cooperation Agency (JICA)

EX RESEARCH INSTITUTE LTD.

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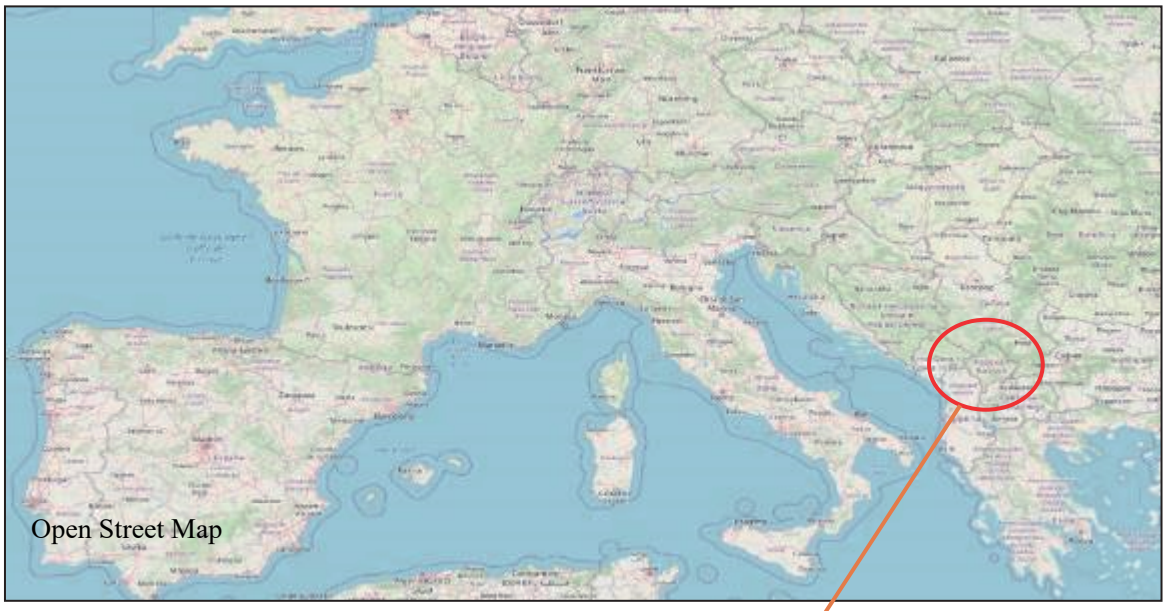
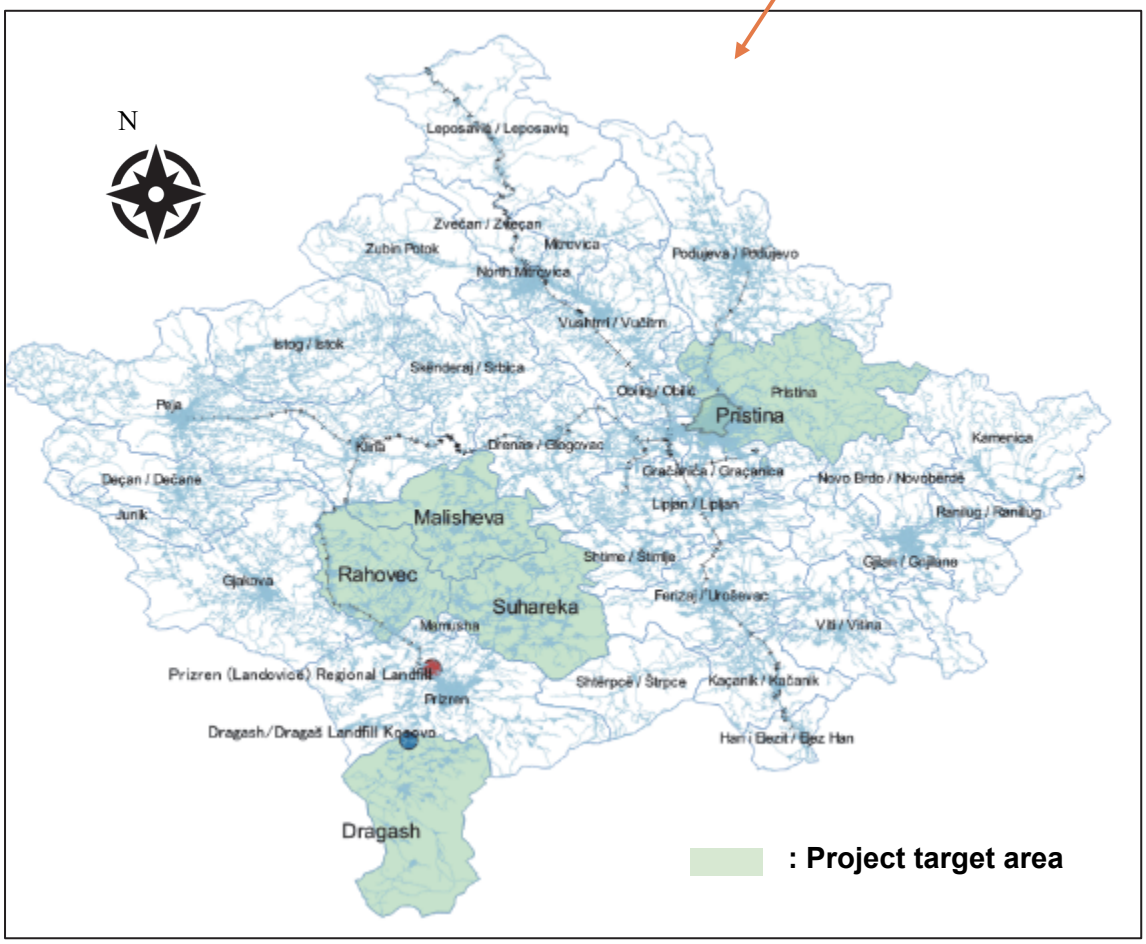
Table of Abbreviations

ABBREVIATION	ENGLISH
AI	Administrative Instructions
AKM	Association of Kosovo Municipalities
CA	Capacity Assessment
C/P	Counterpart
CER	Clean Environment Race
DEMOS	Project for Decentralization and Municipal Support
DEWP	Department of Environment and Water Protection
DWC	Division of Wastes and Chemicals
EC	European Commission
Ekodrinia WC	Ekodrinia Waste Company
Ekoregjioni DU	Ekoregjioni Dragash Unit
Ekoregjioni MU	Ekoregjioni Malisheva Unit
Ekoregjioni RU	Ekoregjioni Rahovec Unit
Ekoregjioni RWC	Ekoregjioni Regional Waste Company
Ekoregjioni SU	Ekoregjioni Suhareka Unit
EOJ	Embassy of Japan
EU	European Union
GI	Gender Initiative
GIZ	German Corporation for International Cooperation
GPS	Global Positioning System
JCC	Joint Coordination Committee
JET	JICA Expert Team
JICA	Japan International Cooperation Agency
KEPA	Kosovo Environmental Protection Agency
KESCO	Kosovo Electricity Supply Company
KLMC	Kosovo Landfill Management Company
KSA	Kosovo Agency of Statistics
MOE	Ministry of Economy
MEI	Ministry of European Integration
MESPI	Ministry of Environment, Spatial Planning and Infrastructure
MLGA	Ministry of Local Government Administration
PAMKOS	Association of Kosovo Waste Companies
PCR	Project Completion Report
PDM	Project Design Matrix
PKMM	Municipal Plan for Waste Management (AI:Plani Komunal për Menaxhim të Mbeturinave)
PO	Plan of Operations
POS	Public Opinion Survey
PP	Pilot Project
PWT	Project Working Team
R/D	Records of Discussion
RWC	Regional Waste Company
SDC	Swiss Agency for Development and Cooperation
SIDA	Swedish International Development Cooperation Agency
WACS	Waste Amount and Composition Survey
WMO	Waste Management Officer
WP	Work Plan
WWRO	Waste and Water Regulatory Office

MAP OF TARGET AREA





1 Background and implementation process

1.1 Background

From September 2011 to September 2015, JICA implemented the technical cooperation project “The Project for Enhancement of the Capacity for Waste Management Toward Sound Material-Cycle Society” (hereinafter referred to as “the former project”). During the former project period, a grant agreement on “The Project for Improvement of Solid Waste Management” was signed in October 2012. After that, in December 2020, collection trucks were donated to Prizren Municipality and four target municipalities as non-project grant aid. In the former project, the following knowledge and experience on SWM were obtained in Prizren Municipality:

1. Improvement of waste collection services in the municipality
2. Improvement of financial resources by setting and collecting a waste tax
3. Increase in the number of staff in the waste management section
4. Upgrade of vehicle operation management method by installing GPS on collection vehicles

From June 2017 to July 2018, in order to improve the capacity of solid waste management of the Ministry of Environment and Spatial Planning and Infrastructure (hereinafter referred to as “MESPI”), the former “Ministry of Environment and Spatial Planning” (hereinafter referred to as “MESP”) implemented “The Advisory Work for Enhancement of Capacity for Waste Management Toward Sound Material-Cycle Society” (hereinafter referred to as “Advisory work”), which was based on the above-mentioned improvements, also known as the “Prizren model”.

The measures taken in the former project, which established a department in charge of waste management staffed with appropriate personnel, and introduced a waste tax, allowed Prizren to improve its waste management capacity, and received high praise throughout Kosovo. On the other hand, similar results could not be achieved in the four target municipalities of the project, which were also included as project sites in the former project.

This project was designed to strengthen the capacity of the four municipalities and MESPI to improve waste management in these small and medium-sized municipalities (Malisheva, Suhareka, Dragash, and Rahovec municipalities) with limited resources, including budget and personnel, with a view to eventually establishing a waste management model for dissemination and deployment in other municipalities in Kosovo. The project was conducted to establish a waste management model for eventual dissemination and deployment to small and medium-sized municipalities in Kosovo.

1.2 Implementation process

The project was implemented in two phases: the first detailed planning phase (May 2021 to March 2022) and the second full-scale phase (May 2022 to July 2024).

In the detailed planning phase, the issues and capabilities of the waste management situation in the four target municipalities and their stakeholders were analyzed. The issues to be resolved and their priorities were identified. Pilot projects to be implemented in the four target municipalities were also planned, and achievement targets and monitoring indicators were established.

In the second phase, pilot projects were implemented in each Municipality based on the "design of pilot projects (PP) for each municipality" and the "establishment of achievement targets and monitoring indicators for each municipality" conducted in the first phase.

2 Outline of the Project

2.1 Project title

The Project for Enhancement of Capacity for Waste Management Toward Sound Material-Cycle Society Phase 2

2.2 Target waste

Solid waste (mainly municipal solid waste)

2.3 Overall goal

The models developed in the target municipalities are disseminated in small municipalities in Kosovo.

2.4 Project purpose

Methods to improve solid waste management in small/medium-sized municipalities are developed based on the experience in the target municipalities and Prizren Municipality.

2.5 Expected outputs and activities

【Output1】Current status, challenges, and priorities toward the improvement of waste management in target municipalities are identified.	
1 – 1	Review and analyze the current situation and challenges of waste management including fee collection mechanisms in the target municipalities.
1 – 2	Conduct capacity assessment of waste management in the target municipalities.
1 – 3	Conduct stakeholder analysis in the target municipalities to identify incentive mechanisms, potential partners, and division of responsibilities.
1 – 4	Based on the findings of 1-1, 1-2, 1-3, identify key issues and their priorities and analyze the similarities and specificities between the target and Prizren municipalities.
1 – 5	Conduct comprehensive monitoring at the end of respective activities under Output 2, 3, 4, and 5 in the target areas.
【Output2】Method for improvement of waste management is developed in Malisheva Municipality.	
2 – 1	Based on the findings of 1-1, 1-2, and 1-3 conduct problem-analysis to understand the root causes in Malisheva Municipality.
2 – 2	Formulate a plan with targets to be achieved and monitoring indicators to address the root causes identified in 2-1
2 – 3	Conduct a pilot project utilizing the applicable lessons from Prizren Municipality in Malisheva Municipality.
2 – 4	Develop the Waste Management Plan (draft) in Malisheva Municipality.
2 – 5	Develop a report for sharing the lessons in Malisheva Municipality with other municipalities.
【Output3】Method for improvement of waste management is developed in Suhareka Municipality.	
3 – 1	Based on the findings of 1-1, 1-2, and 1-3 conduct problem-analysis to understand the root causes in Suhareka Municipality.
3 – 2	Formulate a plan with targets to be achieved and monitoring indicators to address the root causes identified in 3-1.
3 – 3	Conduct a pilot project utilizing the applicable lessons from Prizren Municipality in Suhareka Municipality.
3 – 4	Based on the result of the pilot project, review and analyze the existing Waste Management Plan and explore ways to reflect the outcomes, remaining issues, and lessons learned, and consider necessary efforts for further improvement in Suhareka Municipality.
3 – 5	Develop a report for sharing the lessons in Suhareka Municipality with other municipalities.
【Output4】Method for improvement of waste management is developed in Rahovec Municipality.	
4 – 1	Based on the findings of 1-1, 1-2, and 1-3 conduct problem-analysis to understand the root causes in Rahovec Municipality.

4 – 2	Formulate a plan with targets to be achieved and monitoring indicators to address the root causes identified in 4-1.
4 – 3	Conduct a pilot project utilizing the applicable lessons from Prizren Municipality in Rahovec Municipality.
4 – 4	Based on the result of the pilot project, review and analyze the existing Waste Management Plan and explore ways to reflect the outcomes, remaining issues, and lessons learned, and consider necessary efforts for further improvement in Rahovec Municipality.
4 – 5	Develop a report for sharing the lessons in Rahovec Municipality with other municipalities.
【Output5】	Method for improvement of waste management is developed in Dragash Municipality.
5 – 1	Based on the findings of 1-1, 1-2, and 1-3 conduct problem-analysis to understand the root causes in Dragash Municipality.
5 – 2	Formulate a plan with targets to be achieved and monitoring indicators to address the root causes identified in 5-1.
5 – 3	Conduct a pilot project utilizing the applicable lessons from Prizren Municipality in Dragash Municipality.
5 – 4	Based on the result of the pilot project, review and analyze the existing Waste Management Plan and explore ways to reflect the outcomes, remaining issues, and lessons learned, and consider necessary efforts for further improvement in Dragash Municipality.
5 – 5	Develop a report for sharing the lessons in Dragash Municipality with other municipalities.
【Output6】	New methods and guidance for small and medium-sized municipalities in waste management are compiled.
6 – 1	Set up a Project Working Team (PWT) chaired by MESPI with the participation of relevant government agencies and identify effective ways for dissemination of the experience of the target municipalities.
6 – 2	Based on the reports developed in target municipalities, review and analyze the impact and implications applicable to other municipalities.
6 – 3	Prepare a comprehensive report of waste management activity in each municipality and develop materials for dissemination, such as guidelines for efficient and sustainable waste management.
6 – 4	Conduct seminars and workshops targeting various stakeholders including other municipalities, public agencies, citizens, and development partners.
6 – 5	Develop a mechanism for regularly sharing lessons for further improvement of waste management between MESPI, cross-ministerial working group, and municipalities.
6 – 6	Examine necessary legislations (policies, plans, and regulations) through the discussion with the Project Working Team to address issues identified in 6-5.

- The former name of MEE was changed to MESPI due to organizational change.

2.6 Project area

Malisheva Municipality, Suhareka Municipality, Rahovec Municipality, and Dragash Municipality

2.7 Counterparts of the project (C/P)

MESPI, four target municipalities (Malisheva Municipality, Suhareka Municipality, Rahovec Municipality, and Dragash Municipality)

2.8 Purpose of project implementation

As agreed in the R/D signed by the government of the Republic of Kosovo on February 2, 2021, the purpose of the Project is to develop the methods to improve solid waste management in small and medium-sized municipalities based on the experience in the target municipalities and Prizren Municipality.

2.9 Implementation policy

Achievement of the project objectives of this project will be achieved by increasing the organizational level capacity of the C/P. Therefore, the C/Ps will take the initiative to implement the project. The Japanese expert team implemented the project to support this.

2.10 Project implementation structure

The project implementation structure is based on the diagram below, as shown in the R/D.

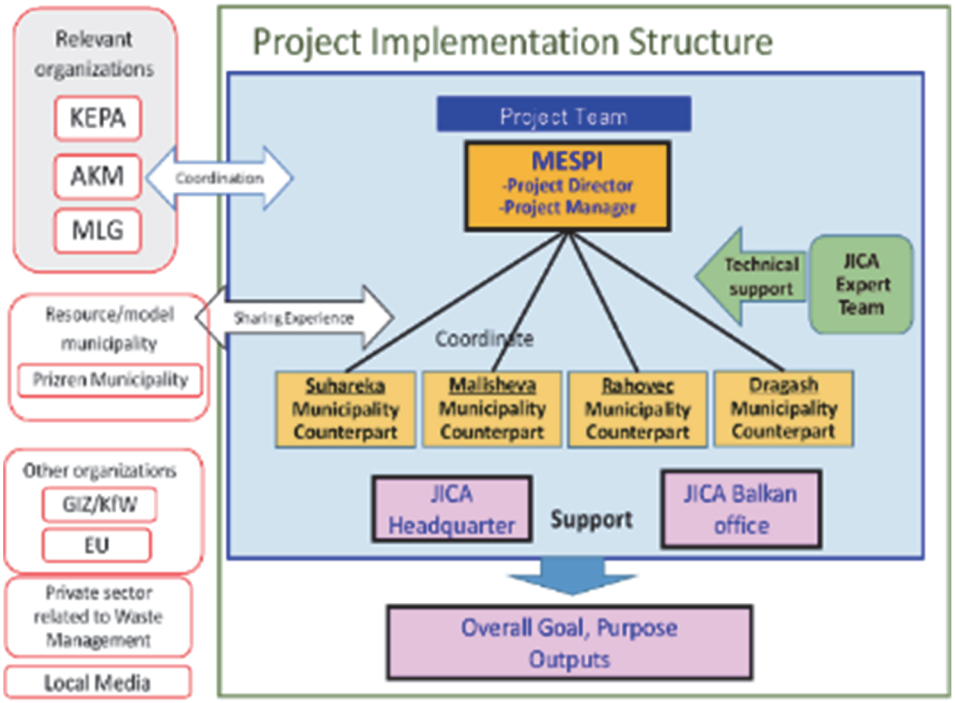


Figure 2-1: Implementation structure of JET and C/P

2.10.1 Project implementation process plan and achievements

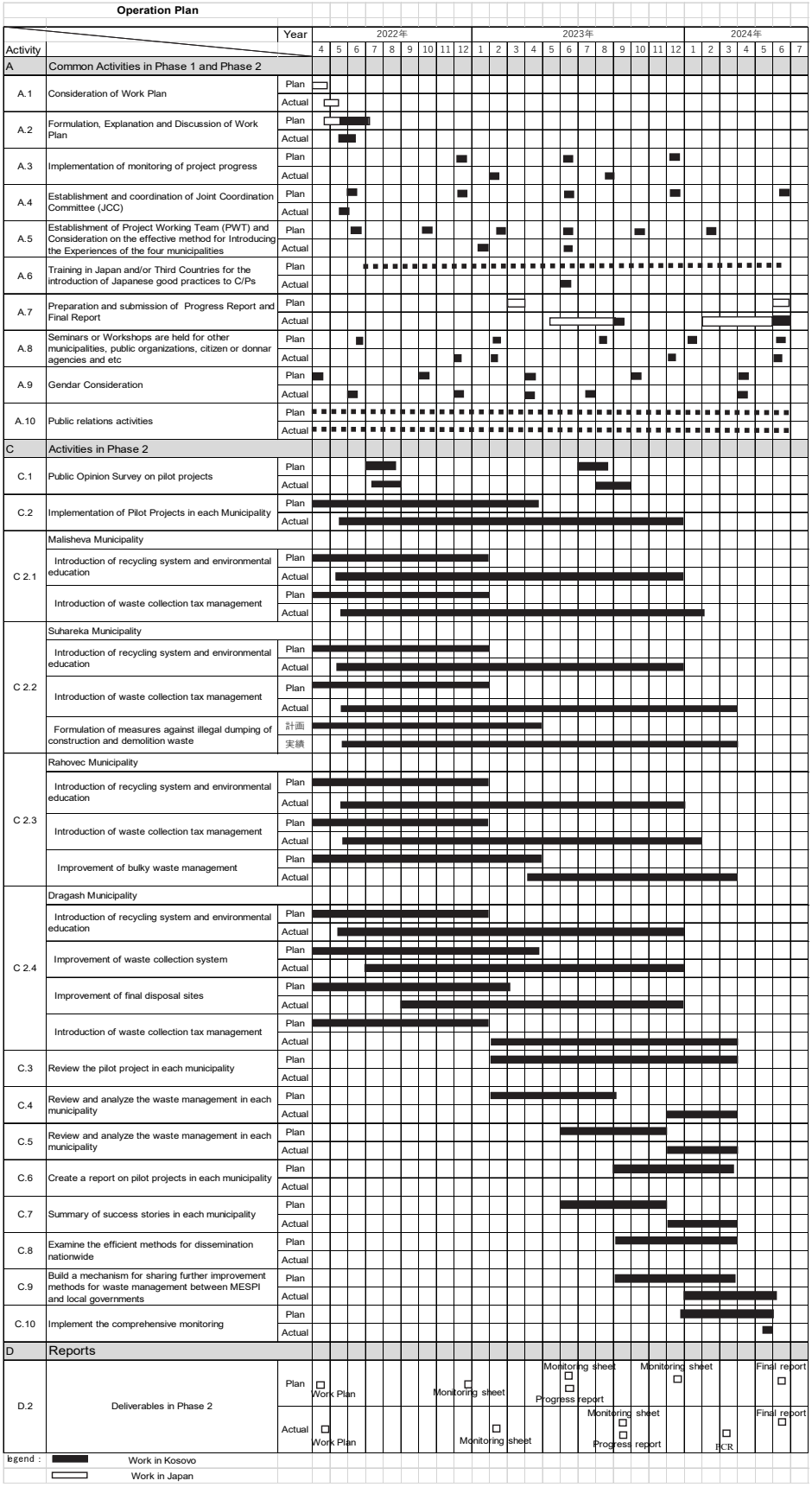


Figure 2-2: Implementation process plan and results

2.10.2 Joint Coordination Committee (JCC)

The JICA expert team supported the establishment of the Joint Coordination Committee (JCC), which consisted of the following members and was led by the Kosovo side. The JCC met approximately once every six months, mainly on the initiative of the Kosovo side.

Table 2-1: Outline of JCC

Functions	1. Approval of work plan based on PDM and PO 2. Review of progress of the Project 3. Evaluation of the Project 4. Exchanged of views and ideas on major challenges which arised during the implementation period of the Project 5. The adequacy of the PDM was evaluated during the course of the project and revisions were proposed as needed. 6. Discussion on any other related issues	
Frequency	Once every 6 months	
Chairperson	Project Director of MESPI	
Members	Kosovar Side	Project Manager from MESPI Officials from MESPI Project Coordinator from Malisheva Municipality Project Coordinator from Suhareka Municipality Project Coordinator from Rahovec Municipality Project Coordinator from Dragash Municipality
	Japanese Side	JICA Experts Representative(s) from JICA Balkan Office / JICA HQ Others agreed by the C/P and JICA
Observers	Officers from Prizren Municipality Representatives from the Embassy of Japan in Kosovo Representatives from other relevant ministries and government organizations Representatives from relevant organizations (NGOs, etc.) Representatives from international organizations (if necessary)	

Table 2-2 : Counterparts of the Project (C/P)

Name	Title	In Charge
Mr. Abdullah Pirce	Acting Director of Department for Environment and Water Protection, MESPI	Project Director
Mr. lbrahim Balaj	Deputy Head of Waste and Chemicals Division and Infrastructure and Senior Officer for Landfill Municipal Waste MESPI	Project Manager until September 2023
Mr. Abdullah Pirçe	MESPI Climate Change Officer, Department of Environment and Water Protection / Industrial Pollution Control Division	Project manager from January 2024
Mr. Naser Morina	Senior Waste Management Officer, Malisheva Municipality	Project Coordinator
Mr. Fisnik Tahiri	Waste Management Officer, Suhareka Municipality	Project Coordinator
Ms. Bjondina Ramaj	Waste Coordinator, Rahovec Municipality	Project Coordinator
Mr. Bashkim Emin	Waste Management Officer, Dragash Municipality	Project Coordinator
Mr. Redzep Ibraimi	Public service officer, Dragash Municipality	Project Coordinator

Table 2-3: Project Working Team Member

Name	Title	In Charge
Ms. Lendita Sopa*	MESPI	Team Leader
Mr. Armend Agushi	AKM	Team member
Mr. Avni Krasniqi*	Senior Inspector of Environment	Team member

*Since October 2023, there has been a change of personnel, etc., and as of March 2024, only Mr. Armend is a member of the PWT, making it practically non-functional.

Table 2-4 : JICA Expert Team (JET)

Name	In Charge
Mr. Hiroshi KATO	Team Leader / Solid Waste Management / Institutional Management
Dr. Naofumi SATO	Collection and Transportation
Dr. Paulo QUEIROZ SOUSA	Institution / Finance Economic Analysis
Ms. Mie NAGAYASU	Capacity Assessment / Public Awareness 1
Ms. Rie KAWANISHI	Capacity Assessment / Public Awareness 2
Mr. Akifumi KANACHI	Data Management / Monitoring 2
Ms. Senada BEKTESHI	National staff of JICA Expert Team
Ms. Njomeza TASHA	National staff of JICA Expert Team
Mr. Jon GOTA	National staff of JICA Expert Team
Mr. Enver Tahiri	Advisor to JET

Table 2-5: Project Team Members

Output	Project Member	Japanese Experts
Output 1	Mr. Abdullah Pirçe	Mr. Hiroshi KATO
Output 2	Mr. Naser Morina	Dr. Naofumi SATO
Output 3	Mr. Fisnik Tahiri	Mr. Paulo QUEIROZ SOUSA
Output 4	Mrs. Bjondina Ramaj	Ms. Mie NAGAYASU
Output 5	Mr. Bashkim Emin Mr. Redzep Ibraimi	Ms. Rie KAWANISHI Mr. Akifumi KANACHI
Output 6	Mr. Abdullah Pirçe	

2.10.3 Project Design Matrix (PDM)

Project Design Matrix

Project Title: The Project for Enhancement of Capacity for Waste Management toward Sound Material-Cycle Society Phase 2 **Version 3**
Implementing Agency: Ministry of Environment, Spatial Planning and Infrastructure, Malisheva Municipality, Suhareka Municipality, Rahovec Municipality, Dragash Municipality **Dated 20 September 2023**

Target Group: Organizations relevant to solid waste management in Prizren Region

Period of Project: July 2021-July 2024 (3 years)

Project Site: Prizren Region **Model Site: Malisheva, Suhareka, Rahovec, Dragash**

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption	Achievement	Remarks
Overall Goal					
The models developed in the four target municipalities are disseminated in small/medium-sized municipalities in Kosovo	・At least five (5) municipalities adopt waste management models that are developed in the target four municipalities.	・Annual report on local governance waste management in Kosovo.		Not yet	
Project Purpose					
Methods to improve solid waste management for small/ medium-sized municipalities are developed based on the experience in the four target municipalities and Prizren Municipality	・Compiled materials based on the activities in the target four municipalities are distributed to all the municipalities in Kosovo. ・National seminar is conducted one (1) time to share the methods developed.	・Distribution record by MESPI ・Report on seminar	・National policies on solid waste management in Kosovo do not change significantly. ・Socio-economic situation in Kosovo does not change significantly.	Not yet	
Outputs					
1. Current status, challenges, and priorities toward the improvement of waste management in target municipalities are identified.	・Survey reports are prepared and made available to the parties concerned.	・Survey report	・The organizational structure including assignment of the counterpart personnel will not change drastically to negatively affect. ・The Kosovar side secures the necessary budget in the course of the Project.	1. Survey reports were completed	
2. Method for improvement of waste management is developed in Malisheva Municipality.	・Developed methods are shared and discussed within the PWT. ・Capacity of Malisheva Municipality is monitored every year.	・Municipality's report. ・Report of the Project Working Team ・Capacity assessment report		2/3/4/5. - C/Ps from the four cities and PWT members have participated in the monthly meetings to share the progress of the project, implementation challenges, and solutions.	
3. Method for improvement of waste management is developed in Suhareka Municipality.	・Developed methods are shared and discussed among the PWT. ・Capacity of Suhareka Municipality is monitored every year.	・Municipality's report. ・Report of the Project Working Team ・Capacity assessment report			
4. Method for improvement of waste management is developed in Rahovec Municipality.	・Developed methods are shared and discussed among the PWT. ・Capacity of Rahovec Municipality is monitored every year.	・Municipality's report. ・Report of the Project Working Team ・Capacity assessment report		- Capacity Sssessments of four Municipalities and MESPI are conducted every six months until June 2024.	
5. Method for improvement of waste management is developed in Dragash Municipality.	・Developed methods are shared and discussed among the Project Working Team. ・Capacity of Dragash Municipality is monitored every year.	・Municipality's report. ・Report of the Project Working Team ・Capacity assessment report			
6. New methods and guidance for small and medium-sized municipalities in waste management are compiled.	・Project Working Team Meeting is held at least every three months. ・Six (6) methods for improvement of waste management in the four target municipalities are shared among PWT. ・Regional seminars are conducted at least five (5) times.	・Meeting reports. ・Reports on seminars.		6. - PWT meetings are held but not every 3 months. - 6 methods developed under the 6 different PPs are shared with four target municipalities and PWT at the monthly meetings. - Regional seminars were conducted 5 times already.	

Activities	Inputs		Pre-Conditions
	The Japanese Side	**The Kosovar Side**	
1-1: Review and analyze the current situation and challenges of waste management including fee collection mechanisms in the target municipalities. 1-2: Conduct capacity assessment of waste management in the target municipalities. 1-3: Conduct stakeholder analysis in the target municipalities to identify incentive mechanisms, potential partners, and division of responsibilities. 1-4: Based on the findings of 1-1, 1-2, 1-3, identify key issues and their priorities and analyze the similarities and specificities between the target and Prizren 1-5: Conduct comprehensive monitoring at the end of respective activities under Output2, 3, 4, and 5 in the target areas. 2-1: Based on the findings of 1-1, 1-2, and 1-3 conduct problem-analysis to understand the root causes in Malisheva Municipality. 2-2: Formulate a plan with targets to be achieved and monitoring indicators to address the root causes identified in 2-1. 2-3: Conduct a pilot project utilizing the applicable lessons from Prizren Municipality in Malisheva Municipality. 2-4: Develop the Waste Management Plan (draft) in Malisheva Municipality. 2-5: Develop a report for sharing the lessons in Malisheva Municipality with other municipalities. 3-1: Based on the findings of 1-1, 1-2, and 1-3 conduct problem-analysis to understand the root causes in Suhareka Municipality. 3-2: Formulate a plan with targets to be achieved and monitoring indicators to address the root causes identified in 3-1. 3-3: Conduct a pilot project utilizing the applicable lessons from Prizren Municipality in Suhareka Municipality. 3-4: Based on the result of the pilot project, review and analyze the existing Waste Management Plan and explore ways to reflect the outcomes, remaining issues, and lessons learned, and consider necessary efforts for further improvement in Suhareka Municipality. 3-5: Develop a report for sharing the lessons in Suhareka Municipality with other municipalities. 4-1: Based on the findings of 1-1, 1-2, and 1-3 conduct problem-analysis to understand the root causes in Rahovec Municipality. 4-2: Formulate a plan with targets to be achieved and monitoring indicators to address the root causes identified in 4-1. 4-3: Conduct a pilot project utilizing the applicable lessons from Prizren Municipality in Rahovec Municipality. 4-4: Based on the result of the pilot project, review and analyze the existing Waste Management Plan and explore ways to reflect the outcomes, remaining issues, and lessons learned, and consider necessary efforts for further improvement in Rahovec Municipality. 4-5: Develop a report for sharing the lessons in Rahovec Municipality with other municipalities. 5-1: Based on the findings of 1-1, 1-2, and 1-3 conduct problem-analysis to understand the root causes in Dragash Municipality. 5-2: Formulate a plan with targets to be achieved and monitoring indicators to address the root causes identified in 5-1. 5-3: Conduct a pilot project utilizing the applicable lessons from Prizren Municipality in Dragash Municipality. 5-4: Based on the result of the pilot project, review and analyze the existing Waste Management Plan and explore ways to reflect the outcomes, remaining issues, and lessons learned, and consider necessary efforts for further improvement in Dragash Municipality. 5-5: Develop a report for sharing the lessons in Dragash Municipality with other municipalities. 6-1: Set up a Project Working Team (PWT) chaired by MESPI with the participation of relevant government agencies and identify effective ways for dissemination of the experience of the target municipalities. 6-2: Based on the reports developed in target municipalities, review and analyze the impact and implications applicable to other municipalities. 6-3: Prepare a comprehensive report of waste management activity in each municipality and develop materials for dissemination, such as guidelines for efficient and sustainable waste management. 6-4: Conduct seminars and workshops targeting various stakeholders including other municipalities, public agencies, citizens, and development partners. 6-5: Develop a mechanism for regularly sharing lessons for further improvement of	(1) Assignments of Experts 1) Chief Advisor/SWM planning 2) Collection and Transportation 3) Organizational and Financial Analysis 4) Public awareness/Capacity assessment 5) Data management/Monitoring (2) Training in Japan and/ or Third Countries (3) Provision of equipment and facilities necessary for the project activities (4) Cost for operation in Kosovo	(1) Assignment of Counterparts (C/Ps) 1) Project Director (MESPI) 2) Project Manager (MESPI) 3) Officers of MESPI 4) Officers of Malisheva Municipality 5) Officers of Suhareka Municipality 6) Officers of Rahovec Municipality 7) Officers of Dragash Municipality (2) Cooperation of relevant agencies (3) Office space with facilities necessary for the Project (4) Running expenses for project activities (C/Ps' salary, travel/ daily allowance, etc.)	The effect of COVID-19 does not change significantly. **<Issues and countermesures>** - Although some delays in PP activities cause delays in the preparation of the report for sharing the lessons in each municipality accordingly, it will be developed by each WMO based on the progress report with the assistance of JET by Nov. 2023.

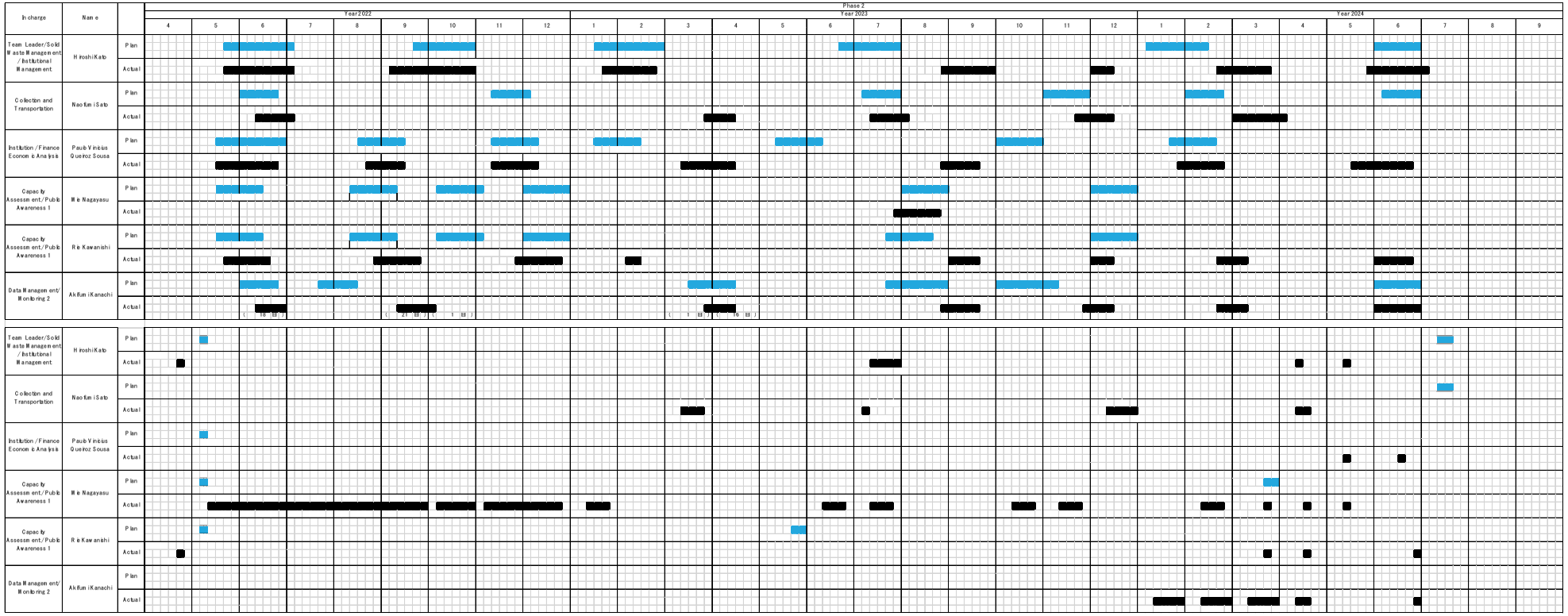
2.11 Project duration

The duration of the Project is approximately 36 months from commencement of the Project in May 2021. The overall schedule is shown below.

2.12 Operation plan

The plan is described in 2.10.1 Implementation Process Plan and Achievements.

2.13 Assignment schedule of JICA experts



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3 Project description

3.1 Support for holding JCC

The JCC was established in Phase One. In principle, it was held approximately every six months to discuss project policies and progress and report on the project. The expert team discussed with the Kosovo side the frequency, venue, and method of holding the JCC and provided support for its smooth operation and holding.

The third JCC meeting was held in Prizren on June 9, 2022. At this meeting, the work plan for the second phase was explained and discussed, and it was approved.

The fourth JCC, held on February 13, 2023, reported the project's progress based on the monitoring sheet; the final JCC, held on June 24, 2024, reported the project's results based on the draft final report.

Table Main agenda for each JCC

	Stage		Date	Main Agenda
Date and Main Agenda (Draft)	Phase 1 (Detailed Planning Phase)	1st	27 July 2021 (Kick-off)	• Explanation of the Project outline and opinion exchange based on the work plan. • Decision on the demarcation of waste management between related organizations.
		2nd	18 February 2022	• Project progress review based on the monitoring sheet. ✓ Clarify and agree on the demarcation of waste management between related organizations. • Decision on the scope of Pilot Projects (PP).
	Phase 2 (Implementation Phase)	3rd	9 June 2022	• Explanation of project contents and opinion exchange based on the draft work plan for Phase 2.
		4th	13 February 2023	• Project progress report based on the monitoring sheet.
		5th	20 September 2023	• Project progress report based on the draft work progress report.
		6th	4 March 2024	• Progress report of the project based on Project Completion Report was presented.
		7th	24 June 2024	• . The project results were reported based on the Draft Business Completion Report.

3.2 Training in Japan

3.2.1 Outline

To understand the actual situation of the Circular Economy in Japan,

- Classroom lectures to learn about the state of waste management administration in Japan
- Observation of waste management facilities in Japanese local governments and exchange of opinions

The details are described in Chapter 4.

3.3 Development and submission of progress report and final report

The seminar to report on activities was held in conjunction with the submission and explanation of the draft final report of the second phase. The venue was in Prizren, where it was easy for C/Ps to participate with about 50 participants, including representatives of other municipalities, public institutions, and donors.

3.4 Gender considerations

The JICA expert team considered gender considerations in the questions of the public opinion survey and in the interviewing process.

3.5 Public relations activities

The Project's significance, activities, and effects were publicized through JICA's website, newsletters, and social media (project account on Facebook: https://www.facebook.com/kswmp) and posted on C/P agencies' websites.

3.6 Support and consultation for preparation of PDM and PO

Based on the PDM and PO finalized at the time of R/D signing, the PO was reviewed and Version 2 was issued together with the PDM at the JCC held in February 2023, according to the actual progress of the pilot project. As the project progressed, the PO was reviewed at the JCC in September 2023, and Version 3 was formulated along with the PDM.

4 Second phase activities

4.1 Outline of activities

The activities of phase 2 consisted of the implementation of the actual and pilot projects and the evaluation of the results.

Based on the results of the first phase, pilot projects were prepared and implemented in the pilot project areas in each Municipality. The expert team provided advice and guidance as appropriate during the implementation, utilizing local mercenaries so that the C/Ps could take the initiative.

The results of the pilot projects were evaluated and analyzed based on the PDM developed in advance, and the results (successes, failures, and lessons learned) were summarized in a pilot project activity report to serve as a reference for future waste management.

4.1.1 Outline of PPs

The outline of the PPs and measures to address other needs were explained to MESPI and each municipality and agreed on as follows.

4.1.1.1 Target sites for PPs implementation

Table 4-1: Target sites for PPs' implementation

Name of PP	Malisheva	Suhareka	Rahovec	Dragash
PP1. Introduction of a recycling system and environmental education	✓	✓	✓	✓
PP2. Improvement of waste collection system				✓
PP3. Improvement of final disposal site				✓
PP4. Introduction of a waste collection tax management system	✓	✓	✓	✓
PP5. Formulation of measures against illegal dumping of construction and demolition waste		✓		
PP6. Improvement of bulky waste management			✓	

4.1.1.2 Outline of PPs

Table 4-2: Outline of PPs

PP1. Introduction of a recycling system and environmental education
1) Introduction of a Recycling System - New recycling systems were introduced in schools and communities. Initially, the system was introduced to all municipalities, but it was canceled in Dragash, as there is no recycler who can purchase the recyclables. - Containers for collecting recyclables (PET bottle caps and aluminum cans) were installed in schools and transported to recycling companies contracted by each municipality with the cooperation of waste collection company (Ekoregjioni). - Members of the school's Eco-Club were responsible for the operation, monitoring, and record keeping. - Profits from the sale of recyclables were used to purchase cleaning supplies and for savings. - □ The municipality coordinated among stakeholders to ensure a sustainable recycling

mechanism and considered the results of the recycling survey. 2) Environmental Education - An Environmental Education Working Group (EEWG) consisting of WMO, Ekoregjioni Corporation, Education Department, NGOs, and JICA expert team was established in the municipality. - Two schools per municipality were selected to develop waste education materials and a program for trainers' training. - Teachers implemented the environmental education program with the support of EEWG. - The results and experiences were shared with other schools and parents in workshops. - After implementing the pilot project, municipalities took the initiative to promote environmental education.
PP2. Improvement of waste collection system
- Analysis of the causes (physical, social, economic, etc.) of the non-collection of waste in specific areas (Gora). - Design of a feasibility plan including the development of discharge, collection, transportation, and disposal systems, and awareness program for the expansion of collection area. - Development of a SWM contract mechanism between the municipality and the collection execution body. - Implementation of expansion of the collection area in accordance with the feasibility plan. - Feedback of the results into the feasibility plan. - Dissemination of the revised feasibility plan to the other areas not covered by collection services during a workshop.
PP3. Improvement of final disposal site
- Dragash is the only one of the four municipalities to have its own landfill. The current landfill operation is simply piling up the waste by pushing it with a bulldozer, without compaction, so the waste is spread throughout the landfill. - To improve this situation, the JICA Expert Team assisted the Municipality in implementing waste layer compaction, shaping the landfill surface, and managing the landfill. - This support improved the Municipality’s ability to carry out landfill operations and improved the situation. - In addition, the installation of weighing equipment in the pilot project allows the Municipality to determine the correct amount of waste and ensures proper landfill management. - The implementation of the pilot project was contingent upon signing a written contract to replace the current oral agreement between the Municipality and Ekoregjioni for the operation of the landfill.
PP4. Introduction of a waste collection tax management system
Currently, RWC Ekoregjioni is responsible for municipal waste collection, directly collecting service fee from the citizens it provides services to. Because RWC Ekoregjioni lacks sufficient enforcement mechanisms, it is unable to secure full payment from all citizens it serves, missing significant revenue which directly impacts the quality of the service provided to citizens.

- Support was provided to municipalities to take over responsibility for taxation of waste taxes to ensure adequate waste management funding, as they have more effective means of waste tax collection. The support included the establishment of a common waste tax management electronic platform. - The implementation of a waste tax collection and management system is contingent on the approval of local ordinances on waste management by the respective municipal councils and the availability of budgetary resources. In this pilot project, support was provided up to the approval by the council and the securing of the budget, but the approval and the securing of the budget itself are the responsibility of the local government.
PP5. Formulation of measures against illegal dumping of construction and demolition waste
- Waste, mainly generated during construction work, was illegally dumped throughout the Suhareka municipality. To solve this problem, the following activities have been carried out as a pilot project: - Development of a model ordinance/regulation to support the development of legislation. - Establishment of a monitoring system to record the status and location of illegally dumped materials and equipment. - Dissemination of information to construction companies on the proper disposal sites for construction and demolition waste.
PP6. Improvement of bulky waste management
- Bulky waste not including C&DW, mainly generated from households, has the potential to cause illegal dumping or shorten the lifespan of the tentative disposal site in Rahovec Municipality.. To solve this problem, the following activities have been carried out: - Analysis of the amount and nature of bulky waste in Rahovec Municipality. - Designed a bulky waste recycling system plan that includes sorting, repairing, and providing second-hand items free of charge through social media. - Implementation of bulky waste recycling. - Feedback of the results into the plan for bulky waste recycling. - Dissemination of the revised plan for bulky waste recycling to the other municipalities.

4.1.1.3 Measures to address other needs

Table 4-3: Measures to address other needs

Other needs	Measures
Formulation of M/P (PKMM) in Malisheva	The JICA expert team conducted technical assistance to develop a waste management plan for the Malisheva municipality under PDM Activities 2-4.
Planning for transfer stations in three municipalities (besides Dragash)*	Since the construction of the transmitter stations could not be completed during the PP period, monthly meetings provided technical assistance related to their planning.
Waste data management in all target municipalities	As a cooperation agreement was reached between GIZ and KEPA to establish a new electronic reporting system for waste management data in 2021, the JET assisted all targeted municipalities in obtaining the data. The team also visited each municipality to discuss the significance of each data and how to reflect the data in plans and policies.

*Dragash municipality has its own landfill.

4.1.1.4 Procurement of materials and equipment

The following materials and equipment were procured to implement the pilot project.

Table 4-4: Materials and equipment for the pilot projects

Name	Specification overview	Quantity	Remarks
Truck scale	3m wide, 12m long, able to weigh up to 60 tons Including concrete work	1 unit	PP3
Dumper truck	Loading capacity of 1,500 kg, 4-wheel drive	1 unit	PP2
Container	1.1m^3 for waste storage	16 units	PP2
Waste collection station	Reinforced concrete and block structure, 13.7m × 4.8m	1 building	PP2
Bulky waste warehouse	Lightweight steel structure, 10m × 4.0m	1 building	PP6
Bulky waste management shed	Synthetic resin container house	1 building	PP6
Tools	For repair for bulky waste recycling	1 set	PP6
Recycling containers	For recycling at school	1 set	PP1

Truck scale

Dumper truck

1.1m^3 containers

Waste collection station

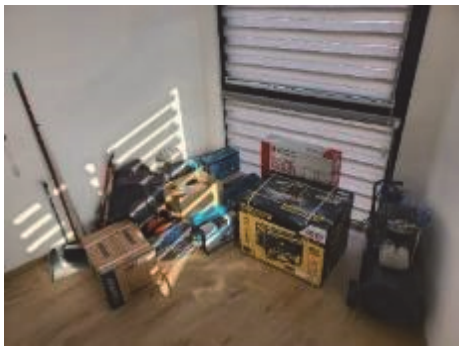
	
Bulky waste warehouse	Bulky waste management shed
	
Tools	Recycling containers

Figure 4-1: Materials and equipment for the pilot projects

4.2 Field investigation

4.2.1 Capacity assessment

Shortly after the start of the implementation phase of the Project (Phase 2), ex-ante evaluation interviews were held with the C/Ps to set goals for the Project, and mid-term review was conducted based on these goals.

4.2.1.1 Objectives of the assessment

The target of the capacity assessment (CA) was MESPI at the central level, and the four target municipalities at the local level.

Table 4-5: C/P to be assessed

Institution	Name	Title
MESPI	Mr. lbrahim Balaj	Senior Landfill Officer, Waste and Chemicals Division and Infrastructure
MESPI	Mr. Abdullah Pirçe*	Acting Director for Department for Environment and Water Protection
Malisheva Municipality	Mr. Naser Morina	Municipal Waste Officer
Suhareka Municipality	Mr. Fisnik Tahiri	Municipal Waste Officer
Rahovec Municipality	Ms. Bjondina Ramaj	Senior Environmental Officer and Waste Coordinator
Dragash Municipality	Mr. Bashkim Emini	Municipal Waste Officer
Dragash Municipality	Mr. Redzep Ibrahimi	Municipal Public Service Officer

*Mr. Ibrahim Balaj took a leave of absence in October 2023 and was replaced by Mr. Abdullah Pirçe in January 2024.

4.2.1.2 Assessment methodology and timing

Organizational and individual assessment of the target organizations were carried out. The organizational assessment was a four-level quantitative evaluation, setting the stages of capacity building towards the achievement of results in each target organization (in municipalities, mainly linked to pilot project activities). The Project basically started with a rating of 1 at the beginning of the Project and aimed for 4 at the end of the Project. For the individual assessment, a qualitative evaluation was conducted in which each person to be evaluated set targets for the capacity they wanted to strengthen through the Project and their progress was checked. The targets were set after an interview in the presence of officers and directors, and were agreed upon. The evaluation was based on a self-evaluation by each C/P, followed by an interview with a Japanese expert who made a final evaluation and agreed on a mutually satisfactory evaluation.

The timing of the evaluation was set to be carried out every six months.

Table 4-6: Evaluation timing

Timing	Type of evaluation
June 2022	Ex-ante evaluation
December 2022	Mid-term review
September 2023	Mid-term review
February 2024	Mid-term review
March 2024	Ex-post evaluation**

*Due to implementation of training in Japan in June 2023, CA was carried out in September 2023.

** The Ex-post evaluation was set for March 2024 in order to submit the draft final report three months before project completion.

4.2.1.3 CA of waste management at central level

a. Organizational assessment

MESPI built its capacity through activities related to Outcome 6 of the Project. Specific activities are the establishment of a dissemination system and the creation of tools for the dissemination of new and improved methods of waste management in small and medium-sized municipalities. At the time of mid-term review, it was confirmed that discussions on dissemination methods and systems, including the Association of Kosovo Municipalities (AKM), have now been set up.

However, the project working team for dissemination was not structured due to the absence of the project manager for three months from October 2023, and as a working team, the main activities such as sharing lessons learned on improving waste management were not undertaken.

At the JCC in September 2023, it was agreed that MESPI would compile a comprehensive report on the activities of the four municipalities by February 2024 based on the activity reports of each municipality, but as mentioned above, the absence of the project manager meant that the report could not be prepared and was written by Japanese experts. Furthermore, in the 2nd dissemination workshop held in December 2023, the JICA expert had to chair the seminar due to the absence of the project manager. Given this background, the MESPI evaluation is as follows:

Table 4-7: Capacity Assessment for MESPI

Items	Criteria				December 2022	September 2023	March 2024
	1	2	3	4			
Formulation and sharing of new improvement methods and implementation policies for waste management for medium-sized municipalities based on the experiences of the four target municipalities	System for disseminating new methods of improvement and implementation policies for waste management in small and medium-sized municipalities in Kosovo do not exist.	A Project Working Team consisting of related organizations has been established and is led by MESPI, and efficient methods for dissemination are being considered.	Lessons learned on improving waste management are regularly shared among MESPI, interministerial working teams and municipalities.	MESPI/Project Working Team takes the initiative and seminars/implementation workshops on waste management have been conducted.	2	2	2
	The challenges of waste management in small and medium-sized municipalities in Kosovo are not grasped.	With JET's assistance, the results of the activities and the suggestions that can be applied to other municipalities are being reviewed and analyzed based on the reports	With JET's assistance, a comprehensive report based on the activities of the four target municipalities has been compiled and dissemination materials have been prepared.	Comprehensive reports and educational materials based on the activities of the four target municipalities have been shared, and laws and regulations necessary to address the	1	1	1

		prepared by the four target municipalities.		identified issues have been discussed.			

b. Individual assessment

b.1 Ibrahim Balaj/ Mr. Abdullah Pirçe

As mentioned above, there has been a change in the MESPI contact person (Project Manager) since October 2023. The previous MESPI officer, Ibrahim Balaj, who had been in charge of the project since its inception, was asked during the goal-setting interviews about the capacities he wanted to strengthen through the project, but he only mentioned his expectations of the Japanese experts and local authorities, and did not mention his own goals as a MESPI officer. The Japanese expert patiently continued to explain the leadership of MESPI, but the role of MESPI in relation to Outcome 6 was not properly understood.

After Mr. Ibrahim left MESPI, his successor, Mr. Abdullah Pirçe, took over in January 2024, but had already completed the majority of project activities. Although there were only a few months remaining before the project completion, Mr. Pirçe understood his dissemination responsibilities as MESPI and lobbied the relevant ministries.

4.2.1.4 CA of waste management at local level

Mid-term review at local level as of December 2022 is shown below.

a. Malisheva

a.1 Organizational assessment

Malisheva has made significant progress compared to other municipalities, with a waste management sector established in January 2024 and is preparing for the introduction of a waste tax in July 2024. This is due to the fact that the municipality was highly rated in the Kosovo-wide Performance Grant (a grant consisting of GIZ and SDC funds. The grants are used for waste management, among other things), which made it easier for the Municipal council to pass resolutions, as well as the contribution of the waste officer and the vice mayor.

Table 4-8: Capacity Assessment for Malisheva

Items	Criteria				December 2022	September 2023	March 2024
	1	2	3	4			
Organizational structure	Only one person in charge of waste management has been assigned. No organization dedicated to waste exists.	The number of persons in charge of waste management in the four municipalities will increase (including concurrent duties).	An organization dedicated to waste management (Waste Management Division) is established in the municipality.	The Waste Management Division is consistently engaged in its work and is working to strengthen cooperation with other municipalities to address wide-area issues.	1	2	3
Formulation of the waste management plan	The waste management plan has not been formulated.	With JET's assistance, Malisheva has understood the purpose of waste management plans and the concept of the framework necessary for formulating plans.	The waste management plan has been developed with JET's assistance.	The developed waste management plan is approved by the assembly and put into operation.	2	2	3
Provision of information on the formulation of Transfer station plans in three cities other than Dragash Municipality	The plan of the transfer station has not been formulated.	With JET's assistance, the concept of planning a transfer station is clarified. The necessary information for planning and the method of collecting information are understood.	With JET's assistance, the information necessary for the formulation of the plan is collected, evaluated, and the outline of the plan has been defined.	The plan of the transfer station has been formulated.	2	2	2
Data management	Although a new electronic reporting system for waste management	With JET's assistance, the data necessary for waste management	Waste management data has been obtained for each municipality.	A system for acquiring the data necessary for planning has been established	2	2	3

Items	Criteria				December 2022	September 2023	March 2024
	1	2	3	4			
	data has been established at KEPA, the necessary data has not been acquired.	has been acquired.		in the municipality.			
Environmental education and awareness	Environmental education has not been conducted or only partially conducted.	With JET's assistance, environmental education has been conducted at pilot schools.	Environmental education has been planned and conducted by the municipality elsewhere than in the pilot schools.	A model for introducing environmental education applicable to small and medium-sized municipalities in Kosovo has been shared.	2	3	4
Recycling market	Recycling market does not exist / Some valuable materials are collected informally.	With JET's assistance, school or community-based recycling systems have been introduced.	School or community-based recycling systems have been introduced by the municipality.	A recycling system applicable to small and medium-sized municipalities in Kosovo has been shared.	1	3	4
Waste tax	Budget for household waste collection has not been allocated. The breakdown of waste disposal costs is not known.	With JET's assistance, the breakdown of waste disposal costs (collection and transportation, and disposal) is understood.	A waste tax has been introduced in the municipality.	The annual budget for household waste collection based on waste tax revenue is secured.	2	2	3
	The waste collection fee is collected from citizens directly by waste collectors (e.g. Ekoregjioni).	With JET's assistance, a waste tax collection management system has been introduced.	A contract between the municipality and the waste collection companies has been signed for the collection and transportation of	A method for introducing a waste tax collection management system in small and medium-sized municipalities in Kosovo has been shared.	1	1	3

Items	Criteria				December 2022	September 2023	March 2024
	1	2	3	4			
			household waste.				

a.1 Individual assessment

i. Naser Morina

Mr. Naser was appointed head of the waste management sector, which was established in January 2024, and his coefficient was also raised, as his activities towards the introduction of the waste tax were highly valued within the municipality. In the future, as head of the sector, he will supervise two additional staff members who will be assigned to the sector to ensure the smooth implementation of waste management operations, including the introduction of a waste tax.

Malisheva had not yet developed a waste management plan, but through this project, planning capacity was improved and a plan was drafted with the assistance of Japanese experts. It is expected that the plan will be implemented and reviewed on an ongoing basis.

b. Suhareka

b.1 Organizational assessment

Suhareka identified illegal dumping as one of the issues to be addressed and is working to improve its capacity through a pilot project. The municipality established a monitoring system using the Mobile App and disseminated proper disposal methods for illegal dumping, but the proposed amendments to the Waste Ordinance to take action against illegal dumping had not been approved as of March 2024. Thus the illegal dumping measures did not progress as originally planned.

Table 4-9: Capacity Assesment for Suhareka

Items	Criteria				December 2022	September 2023	March 2024
	1	2	3	4			
Organizational structure	Only one person in charge of waste management has been assigned. No organization dedicated to waste exists.	The number of persons in charge of waste management in the four municipalities will increase (including concurrent duties).	An organization dedicated to waste management (Waste Management Division) is established in the municipality.	The Waste Management Division is consistently engaged in its work and is working to strengthen cooperation with other municipalities to address wide-area issues.	1	1	1

Items	Criteria				December 2022	September 2023	March 2024
	1	2	3	4			
Provision of information on the formulation of transfer station plans in three cities other than Dragash Municipality	The plan of the transfer station has not been formulated.	With JET's assistance, the concept of planning of transfer station is clarified. The necessary information for planning and the method of collecting information are understood.	With JET's assistance, the information necessary for the formulation of the plan are collected, evaluated, and the outline of the plan has been defined.	The plan of the transfer station has been formulated.	1	1	1
Data management	Although a new electronic reporting system for waste management data has been established at KEPA, the necessary data has not been acquired.	With JET's assistance, the data necessary for waste management has been acquired.	Waste management data has been obtained for each municipality.	A system for acquiring the data necessary for planning has been established in the municipality.	2	3	3
Environmental education and awareness	Environmental education has not been conducted or only partially conducted.	With JET's assistance, environmental education has been conducted at pilot schools.	Environmental education has been planned and conducted by the municipality elsewhere than in the pilot schools.	A model for introducing environmental education applicable to small and medium-sized municipalities in Kosovo has been shared.	2	4	4
Recycling market	Recycling market does not exist / Some valuable materials are collected informally.	With JET's assistance, school or community-based recycling systems have been introduced.	School or community-based recycling systems have been introduced by the municipality.	A recycling system applicable to small and medium-sized municipalities in Kosovo has been shared.	1	3	4
Waste tax	Budget for household waste collection has not been allocated. The breakdown of waste disposal costs is not known.	With JET's assistance, the breakdown of waste disposal costs (collection and transportation, and disposal) is understood.	A waste tax has been introduced in the municipality.	The annual budget for household waste collection based on waste tax revenue is secured.	2	2	2
	The waste collection fee is collected from citizens directly by waste collectors (e.g. Ekoregjioni).	With JET's assistance, a waste tax collection management system has been introduced.	A contract between the municipality and the waste collection companies has been signed for the collection and transportation of household waste.	A method for introducing a waste tax collection management system in small and medium-sized municipalities in Kosovo has been shared.	1	1	1
Reduction of illegal dumping	Measures against illegal dumping of construction waste have not been implemented.	With JET's assistance, the occurrence of new illegal dumping has been prevented by the formulation of model ordinances on illegal dumping, the establishment of a monitoring	Monitoring has been implemented by the municipality in accordance with the model ordinance on illegal dumping. Information on appropriate disposal methods for construction	Model measures against illegal dumping applicable to small and medium-sized municipalities in Kosovo have been shared.	2	2	2

Items	Criteria				December 2022	September 2023	March 2024
	1	2	3	4			
		system, and the dissemination of a method on the proper treatment of illegal dumping.	and demolition waste has been disseminated by the municipality and the occurrence of new illegal dumping has been prevented.				

b.1 Individual assessment

i. Fisnik Tahiri

With regard to measures against illegal dumping, Mr. Fisnik made efforts to conclude contracts with private companies for the removal of illegal dumping and to introduce mobile app. As for environmental education and recycling, after completing the pilot in December 2022, he took the initiative and promoted the spread of the system; by March 2024, lectures had been held in 22 schools, and the remaining 12 schools will be completed by the end of 2024. Through this activity, he self-assessed an improvement in the presentation skills. In addition, he commented that the project has made them aware of the importance of planning each activity, which the municipality had previously done without a detailed plan.

c. Rahovec

i. Organizational assessment

Rahovec identified improving the management of bulky waste generated by households as one of its challenges and implemented a pilot project to solve this problem. In this pilot project, a facility for bulky waste management (bulky waste warehouse and bulky waste management shed) was constructed at the expense of the Japanese side, and the Municipality outsourced the work to private contractors to use this facility for recycling bulky waste.

The municipality took the initiative to promote environmental education and recycling within the municipality after the pilot was completed in December 2022. In recycling, a recycling system was established whereby plastic bottle caps collected at schools were taken to a recycler with the help of Ekoregjioni.

Table 4-10: Capacity Assessment for Rahovec

Items	Criteria				December 2022	September 2023	March 2024
	1	2	3	4			
Organizational structure	Only one person in charge of waste management has been assigned. No organization dedicated to waste exists.	The number of persons in charge of waste management in the four municipalities will increase (including concurrent duties).	An organization dedicated to waste management (Waste Management Division) is established in the municipality.	The Waste Management Division is consistently engaged in its work and is working to strengthen cooperation with other municipalities to address wide-area issues.	1	1	1

Items	Criteria				December 2022	September 2023	March 2024
	1	2	3	4			
Provision of information on the formulation of transfer station plans in three cities other than Dragash Municipality	The plan of the transfer station has not been formulated	With JET's assistance, the concept of planning of transfer station is clarified. The necessary information for planning and the method of collecting information are understood.	With JET's assistance, the information necessary for the formulation of the plan are collected, evaluated, and the outline of the plan has been defined.	The plan of the transfer station has been formulated.	1	1	1
Data management	Although a new electronic reporting system for waste management data has been established at KEPA, the necessary data has not been acquired.	With JET's assistance, the data necessary for waste management has been acquired.	Waste management data has been obtained for each municipality.	A system for acquiring the data necessary for planning has been established in the municipality.	3	3	3
Environmental education and awareness	Environmental education has not been conducted or only partially conducted.	With JET's assistance, environmental education has been conducted at pilot schools.	Environmental education has been planned and conducted by the municipality elsewhere than in the pilot schools.	A model for introducing environmental education applicable to small and medium-sized municipalities in Kosovo has been shared.	2	4	4
Recycling market	Recycling market does not exist / Some valuable materials are collected informally.	With JET's assistance, school or community-based recycling systems have been introduced.	School or community-based recycling systems have been introduced by the municipality.	A recycling system applicable to small and medium-sized municipalities in Kosovo has been shared.	2	3	4
Waste tax	Budget for household waste collection has not been allocated. The breakdown of waste disposal costs is not known.	With JET's assistance, the breakdown of waste disposal costs (collection and transportation, and disposal) is understood.	A waste tax has been introduced in the municipality.	The annual budget for household waste collection based on waste tax revenue is secured.	1	2	2
	The waste collection fee is collected from citizens directly by waste collectors (e.g. Ekoregjioni).	With JET's assistance, a waste tax collection management system has been introduced.	A contract between the municipality and the waste collection companies has been signed for the collection and transportation of household waste.	A method for introducing a waste tax collection management system in small and medium-sized municipalities in Kosovo has been shared.	1	1	1
Bulky waste management	Bulky waste from households is not managed.	With JET's assistance, a recycling system for bulky waste from households, including sorting, repairing and second-hand sales, has been designed and implemented.	A recycling system for bulky waste from households, including sorting, repairing and second-hand sales, has been designed and implemented by the municipality.	A model for bulky waste management applicable to small and medium-sized municipalities has been shared.	1	2	3

c.1 Individual assessment

i. Bjondina Ramaj

Based on results of various surveys, introduction of environmental education and recycling, the introduction of a waste tax and bulky waste management from households were planned and implemented as pilot projects in Rahovec. Through these experiences, Ms. Bjondina self-assessed that her planning skills had improved. In fact, she was actively involved in the various surveys that formed the basis of the planning, and was also involved as a surveyor, particularly in WACS.

d. Dragash

d.1 Organizational assessment

Dragash is composed of two regions, Albanian Opoja and Bosniak/Serbian Gora, each with different challenges, as the lack of collection services in parts of the Gora region was a major challenge due to its geography, such as mountainous terrain, capacity through a pilot project to improve waste collection and transport.

One major difference from the other three municipalities is that the municipality has its own landfill site, so capacity building for its maintenance and management was also addressed through the pilot project. However, a problem occurred when the truck scale could not be operated due to the lack of electricity supply. In terms of matters of municipal responsibility, it is further worth mentioning the inadequate covering of the disposal site. In Dragash, it is expected that the municipality will work to ensure that the inputs for these improvements are sustained after the project is completed.

Table 4-11: Capacity Assessment for Dragash

Items	Criteria				December 2022	September 2023	March 2024
	1	2	3	4			
Organizational structure	Only one person in charge of waste management has been assigned. No organization dedicated to waste exists.	The number of persons in charge of waste management in the four municipalities will increase (including concurrent duties).	An organization dedicated to waste management (Waste Management Division) is established in the municipality.	The Waste Management Division is consistently engaged in its work and is working to strengthen cooperation with other municipalities to address wide-area issues.	1	1	1
Data management	Although a new electronic reporting system for waste management data has been established at KEPA, the necessary data has not been acquired.	With JET's assistance, the data necessary for waste management has been acquired.	Waste management has been obtained for each municipality.	A system for acquiring the data necessary for planning has been established in the municipality.	2	2	2
Environmental education and awareness	Environmental education has not been conducted or only partially conducted.	With JET's assistance, environmental education has been conducted at pilot schools.	Environmental education has been planned and conducted by the municipality elsewhere than in the pilot schools.	A model for introducing environmental education applicable to small and medium-sized municipalities in Kosovo has been shared.	2	4	4

Items	Criteria				December 2022	September 2023	March 2024
	1	2	3	4			
Recycling market	Recycling market does not exist / Some valuable materials are collected informally.	With JET's assistance, school or community-based recycling systems have been introduced.	School or community-based recycling systems have been introduced by the municipality.	A recycling system applicable to small and medium-sized municipalities in Kosovo has been shared.	2	3	1*
Collection and transportation	Discharge rules do not exist in Brod.	The execution body for waste collection in Brod has been established, and an official contract has been signed between the municipality and Ekoregjioni.	With JET's assistance, a waste collection system operates in Brod.	A model for improving waste collection in rural areas applicable to small and medium-sized municipalities in Kosovo has been shared.	2	4	4
	Equipment and facilities for waste collection do not exist in Brod.	Equipment has been procured, facilities have been built, and appropriate personnel(s) is/are assigned for operation.	Equipment and facilities are operated properly.	Equipment is regularly inspected and maintained as needed.	2	3	4
	Awareness of residents in Brod is low.	With JET's assistance, the way citizens discharge their waste and follow the rules has improved in Brod.	Through voluntary activities carried out by the municipality or execution body for waste collection, citizens' awareness has been enhanced and citizens' cooperation has been obtained.	A method and tools for improving waste collection applicable to small and medium-sized municipalities in Kosovo have been shared.	1	4	4
Maintenance and management of final disposal site	Landfill work is not carried out properly. Waste amount is not weighed (accurate amount is unknown).	With JET's assistance, the basics of landfill operation and landfill management methods are understood.	With JET's assistance, the accurate amount of waste is weighed by installing a truck scale. Appropriate landfill management has started.	The final disposal site is properly managed by the municipality and proper operation is carried out to extend its lifespan.	2	3	3
Waste tax	Budget for household waste collection has not been allocated. The breakdown of waste disposal costs is not known.	With JET's assistance, the breakdown of waste disposal costs (collection and transportation, and disposal) is understood.	A waste tax has been introduced in the Municipality.	The annual budget for household waste collection based on waste tax revenue is secured.	1	2	2
	The waste collection fee is collected from citizens directly by waste collectors (e.g. Ekoregjioni).	With JET's assistance, a waste tax collection management system has been introduced.	A contract between the municipality and the waste collection companies has been signed for the collection and transportation of household waste.	A method for introducing a waste tax collection management system to small and medium-sized municipalities in Kosovo has been shared.	1	1	1

*Initially, Dragash tried to implement recycling through a private contractor, but abandoned the collection during implementation. The municipality then negotiated with another recycler, but they refused due to the low volume of recycling collected at schools in March 2024.

d.2 Individual assessment

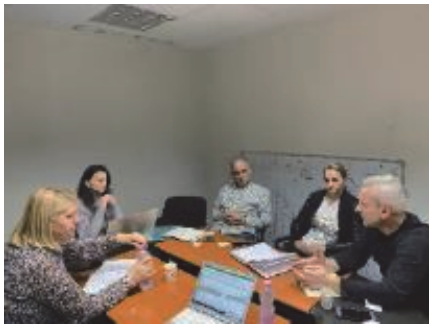
As Dragash consists of two regions, Opoja (Albanian) and Gora (Bosniac / Serbian), and has implemented more pilot projects than the other municipalities, two officers were assigned to implement the activities.

i. Bashkim Emini (mainly in charge of the activities in Opoja region)

Like other municipal officers, Bashkim gave lectures on municipal waste management in pilot schools. In addition, the activities of the pilot project were broadcast on local television (both in Opoja and Gora) to publicize the activities of the municipality to the public.

ii. Redzep Ibrahimi (mainly in charge of the activities in Gora region)

Mr. Redzep is not originally in charge of waste management but of public services, but as he is from Gora, he consulted with the Director General and was officially assigned to a pilot project to improve collection and transport in Brod and environmental education in schools in the Gora region. However, in fact, in addition to the above, he also took the initiative and worked on the introduction of a waste tax and activities to improve the disposal sites, which is commendable. Regarding the collection and transport pilot project, he also communicated closely with the NGOs collecting in the target settlements and facilitated their smooth operation. In addition, he contributed to the expansion of the model to other villages in Dragash.



CA interview with MESPI

CA interview with Malisheva

CA interview with Suhareka

CA interview with Rahovec

CA interview with Dragash

4.2.2 Waste amount and composition survey

4.2.2.1 Survey items

The survey covered household and non-household waste (see Table 4-12). It included a survey of waste discharge intensity, a survey of the physical composition of the wet base, and a Carbon Nitrogen Ratio (C/N ratio) survey.

Plastic bags were distributed to waste generators in advance, and these bags were collected daily and weighed using a spring balance. Interviews were also conducted to determine the family composition and other relevant information. Since the amount of waste collected was large, Samples were taken by applying the quartering method before analysis.

A plastic sheet was laid inside a temporary tent set up in the Landovice Landfill in Prizren, and the waste sample was spread over on the plastic sheet; large waste was cut into pieces, thoroughly mixed, and then divided into four piles of approximately equal volume.

Then, two portions diagonally opposite to each other were removed, and the rest was mixed. This process was repeated until the desired volume remained. See figure below.

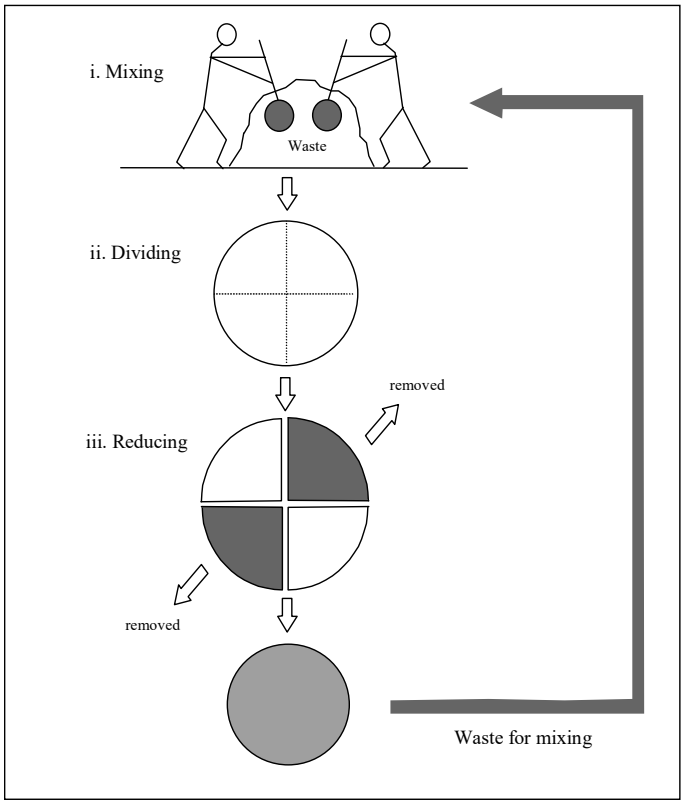


Figure 4-2: Overview of the quartering method

In the first phase, the waste amount and composition survey was conducted during the winter (fieldwork took place from the fourth week of October to the first week of December 2022).

In the second phase, the survey was conducted during the summer (fieldwork took place from the first week of July to the second week of August 2023) when many members of the diaspora return to their home country. The results were compared with the winter season to determine changes in waste volume and quality depending on the time of year. Survey items were the same as in the first period.

This survey was conducted once in the summer and once in the winter for seven consecutive days (one week) by subcontracting.

4.2.2.2 Waste amount survey

The Statistical Agency of Kosovo (SAK) conducts a waste amount survey using a questionnaire for treatment and disposal facilities. However, the waste generation rate is not precise because the survey is not at the level of generation sources. Therefore, this Project analyzed samples obtained directly from waste generation sources such as households, commercial establishments, institutions, markets, and street sweeping.

The survey outline is summarized in the table below.

Table 4-12: Number of samples for the waste amount survey

Source		Number of target areas	Number of samples by area	Waste Amount Survey		
				Number of samples per day	Survey period	Total number of samples
				A × B	-	C × D
		A	B	C	D	E
Households	High income	4	5	20	7	140
	Middle income	4	5	20	7	140
	Low income	4	5	20	7	140
Commercial establishments	Restaurants	1	5	5	7	35
	Others	1	5	5	7	35
Institutions		1	5	5	7	35
Markets		3	1	3	7	21
Street sweeping		3	1	3	7	21
Total		21	-	80	-	560

Households were divided into low-income, middle-income, and high-income groups based on their monthly household income, as shown below, from the resident awareness survey conducted during the first phase.

Table 4-13 : Household category and monthly household income

Income Group	Household Monthly Income (EUR)	Percentage
Low income	0 to 170	5.1%
Middle income	171 to 400	23.5%
High income	More than 401	71.4%

Businesses were surveyed at restaurants, commercial establishments, offices, and markets in the municipalities willing to cooperate with the survey. Street sweeping was conducted in the four target municipalities with the cooperation of the Ekoregjioni units contracted by each municipality to perform this work.

a. Survey results

a.1 Waste discharge rate

(1) Household waste

The values obtained in this survey depend on the population on the characteristics of the survey, and all values are characteristic values obtained by chance. Therefore, the results of the Smirnov-Grubbs test were applied on the winter survey results, summer survey results, average of winter and summer results, and total of winter and summer results, all side by side, to obtain 95% confidence band values. The results are shown in the table below.

Table 4-14: Result of the survey on waste discharge rate by income group

Unit: g/person/day

Categories	Income group	Malisheva	Suhareka	Rahovec	Dragash
Winter	High income	281.0	478.9	624.7	484.1
	Middle income	407.9	594.8	606.6	382.2
	Low income	355.8	439.7	421.5	432.3
Summer	High income	251.2	302.1	304.4	410.1
	Middle income	363.8	558.1	464.9	366.0
	Low income	369.8	619.1	398.0	528.1
Winter and summer (average)	High income	266.6	390.5	464.6	447.1
	Middle income	385.9	576.5	535.8	374.1
	Low income	362.8	529.4	409.7	480.2
Winter and summer (total)	High income	253.8	437.4	431.2	359.9
	Middle income	358.9	591.3	508.6	363.4
	Low income	334.0	571.8	409.7	410.9

(2) Business waste

The waste discharge rate for the business sector followed the concept of the Phase 1 of the Project and was set as the number of units for restaurants, other businesses, and offices. In contrast, the market and street sweeping were set as the rate per area.

The business sector was not subjected to a rejection test due to the small number of samples and the average of the results of the winter and summer surveys was used.

Table 4-15: Waste discharge rate for each source (Average)

	Unit	Malisheva	Suhareka	Rahovec	Dragash
Restaurants	g/place	4,793	7,063	6,146	3,696
Other businesses	g/place	2,402	1,423	3,073	2,368
Institutions	g/m^2	2,236	1,009	3,170	1,270
Market	g/m^2	12	87	34	73
Street sweeping	g/m^2	6	19	3	5

Table 4-16: Waste discharge rate for each source (By Season)

	Discharge source	Unit	Malisheva	Suhareka	Rahovec	Dragash
winter	Restaurants	g/place	3,385	8,664	5,572	3,363
	Other businesses	g/place	2,038	1,802	2,754	2,619
	Institutions	g/m^2	2,332	1,057	4,511	1,264
	Market	g/m^2	9	89	38	71
	Street sweeping	g/place	7	3	3	7
summer	Restaurants	g/箇所	6,200	5,462	6,721	4,029
	Other businesses	g/箇所	2,766	1,045	3,392	2,117
	Institutions	g/m^2	2,140	962	1,829	1,275
	Market	g/m^2	15	86	29	75
	Street sweeping	g/m^2	6	35	2	4
Average	Restaurants	g/箇所	4,793	7,063	6,146	3,696
	Other businesses	g/箇所	2,402	1,423	3,073	2,368
	Institutions	g/m^2	2,236	1,009	3,170	1,270
	Market	g/m^2	12	87	34	73
	Street sweeping	g/m^2	6	19	3	5

4.2.2.3 Waste amount

a. Household

The waste discharge rate survey results for winter and summer averages and population by income group were used to calculate the amount of household waste as follows.

Table 4-17: Population by income group

Unit: person

	High income	Middle income	Low income	Total
Malisheva	40,884	13,456	2,920	57,261
Suhareka	41,551	13,676	2,968	58,194
Rahovec	40,732	13,406	2,909	57,047
Dragash	24,239	7,978	1,731	33,948

Table 4-18: Household waste discharge amount

Unit: ton/day

	High income	Middle income	Low income	Total
Malisheva	10.9	5.2	1.1	17.2
Suhareka	16.2	7.9	1.6	25.7
Rahovec	18.9	7.2	1.2	27.3
Dragash	10.8	3.0	0.8	14.7

b. Business waste

b.1 Number of discharge sources

The number of sources other than street sweeping waste was calculated from the urban household population surveyed in Phase 1 of the Project and the number of sources per capita, as well as the population of the four target municipalities. Total street sweeping values were obtained from each Ekoregjioni Unit.

Table 4-19: Number of waste discharge sources (from Phase 1 of the Project)

Discharge source	Number of discharge sources	Quantity per capita
Restaurants	1,186	0.01237
Other businesses	4,749	0.34090
Institutions	1,337	0.01394
Street sweeping	32,690 m^2	0.04952

b.2 Discharge amount

The following table shows the results of determining the number of sources based on the population of each municipality and number of discharge sources.

Table 4-20: Number of business waste discharge sources

Discharge source	Malisheva	Suhareka	Rahovec	Dragash
Restaurants (nos.)	708	720	6,721	420
Other businesses (nos.)	2,836	2,882	3,392	1,681
Institutions (nos.)	798	811	1,829	473
Street sweeping (m^2)	19,520	19,838	29	11,573
Restaurants (m^2)	2,295	3,266	2	629

The following table shows the results of determining the amount of waste by source based on the above number of sources and the waste amount per unit of business waste.

Table 4-21: Waste discharge amount by source

Unit: ton/day

Discharge source	Malisheva	Suhareka	Rahovec	Dragash
Restaurants	3.4	5.1	4.3	1.6
Other businesses	6.8	4.1	8.7	4.0
Institutions	1.8	0.8	2.5	0.6
Street sweeping	0.2	1.7	0.7	0.8
Restaurants	0.0142	0.0609	0.0116	0.0034
Total	12.2	11.8	16.2	7.0

c. Total discharge amount and disposal amount

The total waste amount and its breakdown, calculated using the results of the above-mentioned waste amount survey, are shown below. The quantities landfilled in 2021 and 2022 are also mentioned.

Table 4-22: Total amount of waste discharged and landfilled in 2021/2022

	Malisheva	Suhareka	Rahovec	Dragash
Household (ton/day)	17.2	25.7	27.3	14.7
Other than household (ton/day)	12.2	11.8	16.2	7.0
Total (ton/day)	29.4	37.5	43.5	21.7
Landfill amount in 2021* (ton/year)	28.9	41.6	39.7	19.7
Landfill amount in 2022* (ton/year)	21.4	28.4	31.0	N/A
Average landfill amount for 2021 and 2022 (ton/day)	25.2	35.0	35.4	19.7
Average landfill ratio for 2021 and 2022 (%)	86%	93%	81%	91%
Difference between Total amount and Average landfill amount (ton/day)	-4.3	-2.5	-8.2	-2.0
Population	57,261	58,194	57,047	33,948
Discharge rate (g/person/day)	513.4	644.4	762.5	639.2
Landfill rate (g/person/day)	439.2	601.4	619.7	580.3

*Amount landfilled at the Landovice landfill site

The household discharge as a percentage of total discharge is calculated by multiplying the daily discharge rate per capita by the population. However, the population data is an estimated value based on the 2011 census and may differ from the actual value The new census was scheduled for 2023, but implementation was delayed, and the in-person survey was conducted from April 5 to May 17, 2024. Given the time required to process the data after the in-person survey, it is highly unlikely that the census results will be available by the end of this project. The counterpart will eventually need to review the figures using the results of the said census..

Regarding disposal rates, 81% to 93% of waste is disposed of, and the recycling rate is generally low, as a large portion of the waste is disposed of in landfills.

d. Waste stream for each municipality

The following is the waste stream diagram for each municipality, prepared based on the results mentioned above.

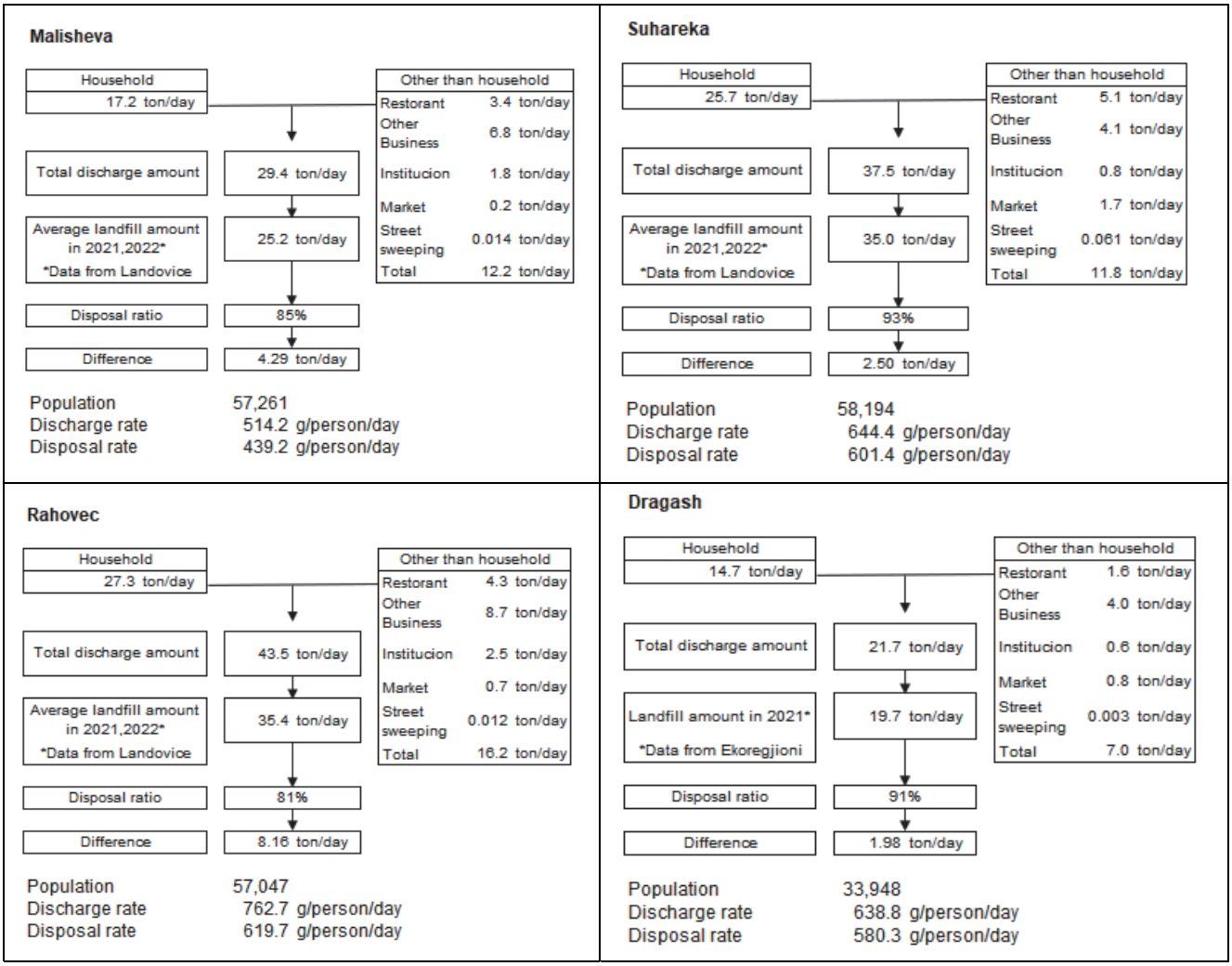


Figure 4-3: Waste stream diagram for each municipality

4.2.2.4 Waste composition survey

The waste composition survey was conducted to determine the apparent specific gravity, physical composition (quality-based), and C/N ratio to explore the possibility of composting. Three out of seven days were selected for the waste amount survey, and the samples obtained from the survey were mixed, subdivided by quadrant, and analyzed.

4.2.2.5 Target

The waste composition survey for the four target municipalities was conducted for the same sources as the waste amount survey. The surveyed quantities are shown below.

Table 4-23: Number of samples for the waste composition survey

3 Generation source		No. of selected districts	No. of samples per district	Waste Composition Survey			
				Samples/ Day	Days of sampling	Physical composition	C/N analysis
				-	-	F × G	F × G
		A	B	F	G		I
Households	High income	4	5	1	3	3	3
	Medium income	4	5	1	3	3	3
	Low income	4	5	1	3	3	3
Commercial establishments	Restaurants	1	5	1	3	3	3
	Others	1	5	1	3	3	3
Institutions		1	5	1	3	3	3
Markets		3	1	1	3	3	3
Street sweeping		2	1	1	3	3	3
Total		20	-	-	-	24	24

4.2.2.6 Survey items

The waste composition survey items were apparent specific gravity, wet-base physical composition (kitchen waste, paper, textiles, green waste (vegetation), grass/wood/bamboo, plastics, rubber/leather, metals, bottles, earth, stones, ceramics, heating ashes, etc.), and C/N ratio (carbon/nitrogen ratio) to examine the possibility of composting.

a. Results of the survey

a.1 Apparent specific gravity

Apparent specific gravity was measured by filling a 120-liter trash can with waste, dropping it three times from a height of 10 cm, and measuring the volume and weight.

Table 4-24: Apparent specific gravity (winter)

Unit: kg/m^3

	Malisheva	Suhareka	Rahovec	Dragash	Overall (average)
Households (average)	97.2	173.4	115.3	123.8	127.4
High income	82.8	151.0	133.1	121.6	122.1
Middle income	101.6	189.4	103.5	120.3	128.7
Low income	107.2	179.9	109.4	129.6	131.5
Restaurants	80.1	116.8	128.4	111.8	109.2
Other businesses	69.9	85.0	94.3	84.7	83.5
Institutions	48.6	47.9	63.5	56.5	54.1
Markets	33.1	110.8	48.6	37.7	57.6
Street sweeping	80.0	88.0	76.1	81.5	81.4

Table 4-25: Apparent specific gravity (summer)

Unit: kg/m^3

	Malisheva	Suhareka	Rahovec	Dragash	Overall (average)
Households (average)	188.1	214.9	191.0	193.1	196.8
High income	179.0	219.7	185.4	167.9	188.0
Middle income	204.2	211.9	196.8	203.3	204.1
Low income	181.3	212.9	190.8	208.2	198.3
Restaurants	225.7	175.1	188.3	182.6	193.0
Other businesses	140.8	99.4	140.3	114.2	123.7
Institutions	106.0	108.5	109.0	105.0	107.1
Markets	128.2	131.0	88.1	78.6	106.5
Street sweeping	215.8	98.8	91.5	81.3	121.8

Table 4-26: Apparent specific gravity (average of winter and summer)

Unit: kg/m^3

	Malisheva	Suhareka	Rahovec	Dragash	Overall (average)
Households (average)	142.7	194.1	153.2	158.5	162.1
High income	130.9	185.3	159.2	144.8	155.1
Middle income	152.9	200.7	150.1	161.8	166.4
Low income	144.2	196.4	150.1	168.9	164.9
Restaurants	152.9	146.0	158.3	147.2	151.1
Other businesses	105.3	92.2	117.3	99.4	103.6
Institutions	77.3	78.2	86.3	80.7	80.6
Markets	80.6	120.9	68.3	58.2	82.0
Street sweeping	147.9	93.4	83.8	81.4	101.6

A weighted average was obtained by applying the results of the waste amount survey to the above-average values for the winter and summer seasons. The results of the apparent specific gravity of the total waste are shown in the table below.

Table 4-27: Apparent specific gravity for each municipality

Unit: kg/m^3

	Malisheva	Suhareka	Rahovec	Dragash	Overall (average)
Overall weighted average	128.2	168.0	143.4	134.7	145.6

b. Physical composition

b.1 Malisheva

(1) Measured values

The samples of the waste amount survey were divided into four quadrants and analyzed for physical composition.

i. Household waste

The physical composition of household waste was analyzed by income group.

Table 4-28: Physical composition of household waste (Malisheva)

Season	Winter			Summer		
Income group	High income	Middle income	Low income	High income	Middle income	Low income
Kitchen waste	46.7%	44.3%	30.3%	35.2%	39.2%	42.1%
Paper	6.4%	6.7%	5.2%	10.6%	15.1%	10.9%
Textiles	1.4%	2.1%	8.5%	5.1%	2.1%	3.1%
Green waste (vegetation)	4.3%	10.2%	13.4%	4.7%	5.8%	6.0%
Grass/wood/bamboo	0.0%	0.0%	0.0%	2.0%	1.8%	5.1%
Plastic	13.1%	13.1%	11.3%	31.5%	19.0%	19.2%
Rubber/leather	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Metal	0.8%	1.2%	1.6%	1.4%	2.9%	2.2%
Bottles/glass	3.3%	6.1%	2.4%	3.8%	6.2%	4.4%
Soil/stones/ceramics	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Ash from heating appliances	0.5%	4.1%	16.2%	0.0%	0.0%	0.0%
Others	23.5%	12.0%	11.1%	5.6%	8.0%	6.9%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Kitchen waste, Green waste and Grass/wood/bamboo	51.0%	54.5%	43.7%	41.8%	46.7%	53.3%

ii. Other than household

For non-household waste, the analysis was based on the categories in the table below.

Table 4-29: Physical composition of non-household waste (Malisheva)

Season	Winter					Summer				
Category	Restaurants	Other businesses	Institutions	Markets	Street sweeping	Restaurants	Other businesses	Institutions	Markets	Street sweeping
Kitchen waste	56.4%	9.4%	23.4%	3.5%	0.0%	35.9%	20.3%	0.0%	12.1%	0.0%
Paper	18.4%	38.8%	33.5%	42.0%	5.7%	19.0%	21.8%	48.3%	22.0%	16.6%
Textiles	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%	0.0%	1.0%
Green waste (vegetation)	0.0%	0.0%	0.0%	0.0%	62.5%	1.4%	0.0%	0.0%	0.0%	16.9%
Grass/wood/bamboo	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Plastic	16.7%	32.9%	37.2%	41.9%	8.5%	15.4%	29.2%	41.5%	35.0%	27.1%
Rubber/leather	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Metal	4.0%	2.0%	2.9%	0.0%	2.2%	2.9%	7.2%	3.9%	1.7%	4.6%
Bottles/glass	4.5%	4.2%	0.6%	4.1%	7.2%	19.3%	21.6%	5.1%	23.4%	8.9%
Soil/stones/ceramics	0.0%	5.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	24.9%
Ash from heating appliances	0.0%	0.0%	0.0%	8.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Others	0.0%	6.9%	1.9%	0.0%	14.0%	6.2%	0.0%	0.0%	5.9%	0.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Kitchen waste, Green waste and Grass/wood/bamboo	56.4%	9.4%	23.9%	3.5%	62.5%	37.3%	20.3%	0.0%	12.1%	16.9%

(2) Estimating the physical composition considering the discharge amount of each source

The table above shows the physical composition of each discharge source. If all discharges from each source were equal, the values in the above table would be the physical composition of the discharged waste.

However, the waste collected is a mixture from each discharge source. To reproduce the physical composition of the waste in this state, JET estimated the physical composition of the waste as it is collected by performing a weighted average of the results of the physical composition analysis using the amount of waste discharged from each discharge source. The results are shown below.

i. Household waste

Table 4-30: Amount of household waste discharged by type of material (Malisheva)

Unit: ton/day	Winter				Summer				Overall
Income group	High income	Middle income	Low income	Total	High income	Middle income	Low income	Total	
Kitchen waste	5.4	2.4	0.3	8.1	3.6	1.9	0.5	6.0	14.1
Paper	0.7	0.4	0.1	1.2	1.1	0.7	0.1	1.9	3.1
Textiles	0.2	0.1	0.1	0.4	0.5	0.1	0.0	0.6	1.0
Green waste (vegetation)	0.5	0.6	0.1	1.2	0.5	0.3	0.1	0.9	2.1
Grass/wood/bamboo	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.4	0.4
Plastic	1.5	0.7	0.1	2.3	3.2	0.9	0.2	4.3	6.6
Rubber/leather	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Metal	0.1	0.1	0.0	0.2	0.1	0.1	0.0	0.2	0.4
Bottles/glass	0.4	0.3	0.0	0.7	0.4	0.3	0.0	0.7	1.4
Soil/stones/ceramics	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ash from heating appliances	0.1	0.2	0.2	0.5	0.0	0.0	0.0	0.0	0.5
Others	2.7	0.7	0.1	3.5	0.6	0.4	0.1	1.1	4.6
Total	11.6	5.5	1.0	18.1	10.2	4.8	1.1	16.1	34.2
Kitchen waste, Green waste and Grass/wood/bamboo	5.9	3.0	0.4	9.3	4.3	2.3	0.7	7.3	16.6

Table 4-31: Physical composition of household waste considering the amount discharged by type of material (Malisheva)

	Winter				Summer				Overall
Income group	High income	Middle income	Low income	Total	High income	Middle income	Low income	Total	
Kitchen waste	46.6%	43.6%	30.0%	44.8%	35.3%	39.6%	45.5%	37.3%	41.2%
Paper	6.0%	7.3%	10.0%	6.6%	10.8%	14.6%	9.1%	11.8%	9.1%
Textiles	1.7%	1.8%	10.0%	2.2%	4.9%	2.1%	0.0%	3.7%	2.9%
Green waste (vegetation)	4.3%	10.9%	10.0%	6.6%	4.9%	6.3%	9.1%	5.6%	6.1%
Grass/wood/bamboo	0.0%	0.0%	0.0%	0.0%	2.0%	2.1%	9.1%	2.5%	1.2%
Plastic	12.9%	12.7%	10.0%	12.7%	31.4%	18.8%	18.2%	26.7%	19.3%
Rubber/leather	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Metal	0.9%	1.8%	0.0%	1.1%	1.0%	2.1%	0.0%	1.2%	1.2%
Bottles/glass	3.4%	5.5%	0.0%	3.9%	3.9%	6.3%	0.0%	4.3%	4.1%
Soil/stones/ceramics	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Ash from heating appliances	0.9%	3.6%	20.0%	2.8%	0.0%	0.0%	0.0%	0.0%	1.5%
Others	23.3%	12.7%	10.0%	19.3%	5.9%	8.3%	9.1%	6.8%	13.5%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Kitchen waste, Green waste and Grass/wood/bamboo	50.9%	54.5%	40.0%	51.4%	42.2%	47.9%	63.6%	45.3%	48.5%

i. Non-household waste

Table 4-32: Amount of non-household waste discharged by type of material (Malisheva)

Unit: ton/day	Winter						Summer						Overall
Category	Restaurants	Other businesses	Institutions	Markets	Street sweeping	Total	Restaurants	Other businesses	Institutions	Markets	Street sweeping	Total	
Kitchen waste	1.4	0.5	0.4	0.0	0.0	2.3	1.6	1.6	0.0	0.0	0.0	3.2	5.5
Paper	0.4	2.2	0.6	0.1	0.0	3.3	0.8	1.7	0.8	0.1	0.0	3.4	6.7
Textiles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Green waste (vegetation)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1
Grass/wood/bamboo	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Plastic	0.4	1.9	0.7	0.1	0.0	3.1	0.7	2.3	0.7	0.1	0.0	3.8	6.9
Rubber/leather	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Metal	0.1	0.1	0.1	0.0	0.0	0.3	0.1	0.6	0.1	0.0	0.0	0.8	1.1
Bottles/glass	0.1	0.2	0.0	0.0	0.0	0.3	0.8	1.7	0.1	0.1	0.0	2.7	3.0
Soil/stones/ceramics	0.0	0.3	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Ash from heating appliances	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Others	0.0	0.4	0.0	0.0	0.0	0.4	0.3	0.0	0.0	0.0	0.0	0.3	0.7
Total	2.4	5.6	1.8	0.2	0.0	10.0	4.4	7.9	1.7	0.3	0.0	14.3	24.3
Kitchen waste, Green waste and Grass/wood/bamboo	1.4	0.5	0.4	0.0	0.0	2.3	1.7	1.6	0.0	0.0	0.0	3.3	5.6

Table 4-33: Physical composition of non-household waste considering discharge amount by composition (Malisheva)

Season	Winter						Summer						Overall
Category	Restaurants	Other businesses	Institutions	Markets	Street sweeping	Total	Restaurants	Other businesses	Institutions	Markets	Street sweeping	Total	
Kitchen waste	58.3%	8.9%	22.2%	0.0%	0.0%	23.0%	36.4%	20.3%	0.0%	0.0%	0.0%	22.4%	22.6%
Paper	16.7%	39.3%	33.3%	50.0%	0.0%	33.0%	18.2%	21.5%	47.1%	33.3%	0.0%	23.8%	27.6%
Textiles	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Green waste (vegetation)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.3%	0.0%	0.0%	0.0%	0.0%	0.7%	0.4%
Grass/wood/bamboo	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Plastic	16.7%	33.9%	38.9%	50.0%	0.0%	31.0%	15.9%	29.1%	41.2%	33.3%	0.0%	26.6%	28.4%
Rubber/leather	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Metal	4.2%	1.8%	5.6%	0.0%	0.0%	3.0%	2.3%	7.6%	5.9%	0.0%	0.0%	5.6%	4.5%
Bottles/glass	4.2%	3.6%	0.0%	0.0%	0.0%	3.0%	18.2%	21.5%	5.9%	33.3%	0.0%	18.9%	12.3%
Soil/stones/ceramics	0.0%	5.4%	0.0%	0.0%	0.0%	3.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.2%
Ash from heating appliances	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Others	0.0%	7.1%	0.0%	0.0%	0.0%	4.0%	6.8%	0.0%	0.0%	0.0%	0.0%	2.1%	2.9%
Total	100.0%	100.0%	100.0%	100.0%	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%	0.0%	100.0%	100.0%
Kitchen waste, Green waste and Grass/wood/bamboo	58.3%	8.9%	22.2%	0.0%	0.0%	23.0%	38.6%	20.3%	0.0%	0.0%	0.0%	23.1%	23.0%

Table 4-34: Summary of physical composition (Malisheva)

Season	Winter				Summer				Winter and Summer			
Category	Household (ton/day)	Other than household (ton/day)	Total (ton/day)	Weighted average Composition	Household (ton/day)	Other than household (ton/day)	Total (ton/day)	Weighted average Composition	Total (ton/day)	Overall composition	Average (ton/day)	Average composition
Kitchen waste	8.1	2.3	10.4	37.0%	6.0	3.2	9.2	30.3%	19.6	33.5%	9.8	33.5%
Paper	1.2	3.3	4.5	16.0%	1.9	3.4	5.3	17.4%	9.8	16.8%	4.9	16.8%
Textiles	0.4	0.0	0.4	1.4%	0.6	0.0	0.6	2.0%	1.0	1.7%	0.5	1.7%
Green waste (vegetation)	1.2	0.0	1.2	4.3%	0.9	0.1	1.0	3.3%	2.2	3.8%	1.1	3.8%
Grass/wood/bamboo	0.0	0.0	0.0	0.0%	0.4	0.0	0.4	1.3%	0.4	0.7%	0.2	0.7%
Plastic	2.3	3.1	5.4	19.2%	4.3	3.8	8.1	26.6%	13.5	23.1%	6.8	23.1%
Rubber/leather	0.0	0.0	0.0	0.0%	0.0	0.0	0.0	0.0%	0.0	0.0%	0.0	0.0%
Metal	0.2	0.3	0.5	1.8%	0.2	0.8	1.0	3.3%	1.5	2.6%	0.8	2.6%
Bottles/glass	0.7	0.3	1.0	3.6%	0.7	2.7	3.4	11.2%	4.4	7.5%	2.2	7.5%
Soil/stones/ceramics	0.0	0.3	0.3	1.1%	0.0	0.0	0.0	0.0%	0.3	0.5%	0.2	0.5%
Ash from heating appliances	0.5	0.0	0.5	1.8%	0.0	0.0	0.0	0.0%	0.5	0.9%	0.3	0.9%
Others	3.5	0.4	3.9	13.9%	1.1	0.3	1.4	4.6%	5.3	9.1%	2.7	9.1%
Total	18.1	10.0	28.1	100.0%	16.1	14.3	30.4	100.0%	58.5	100.0%	29.3	100.0%
Kitchen waste, Green waste and Grass/wood/bamboo	9.3	2.3	11.6	41.3%	7.3	3.3	10.6	34.9%	22.2	37.9%	11.1	37.9%

b.2 Suhareka

(1) Measured values

The samples of the waste amount survey were divided into four quadrants and analyzed for physical composition.

i. Household waste

The physical composition of household waste was analyzed by income group.

Table 4-35: Physical composition of household waste (Suhareka)

Season	Winter			Summer		
Income group	High income	Middle income	Low income	High income	Middle income	Low income
Kitchen waste	51.0%	51.8%	52.2%	47.0%	48.8%	48.1%
Paper	9.9%	5.0%	5.9%	10.1%	6.9%	7.4%
Textiles	3.3%	3.9%	4.4%	3.5%	1.6%	2.5%
Green waste (vegetation)	11.9%	6.3%	19.0%	2.1%	11.8%	15.1%
Grass/wood/bamboo	0.0%	14.7%	5.0%	0.0%	0.0%	0.0%
Plastic	11.9%	13.5%	2.9%	26.3%	18.6%	21.1%
Rubber/leather	0.0%	1.1%	0.7%	0.0%	0.0%	0.0%
Metal	1.5%	1.8%	2.5%	2.2%	1.3%	0.8%
Bottles/glass	1.9%	0.9%	2.1%	4.4%	5.9%	2.3%
Soil/stones/ceramics	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%
Ash from heating appliances	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Others	7.9%	0.9%	5.4%	4.4%	4.9%	2.7%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Kitchen waste, Green waste and Grass/wood/bamboo	62.9%	72.8%	76.2%	49.1%	60.7%	63.2%

ii. Non-household waste

For non-household waste, the analysis was based on the categories in the table below.

Table 4-36: Physical composition of non-household waste (Suhareka)

Season	Winter					Summer				
Category	Restaurants	Other businesses	Institutions	Markets	Street sweeping	Restaurants	Other businesses	Institutions	Markets	Street sweeping
Kitchen waste	29.8%	11.3%	0.0%	14.9%	24.1%	31.0%	16.6%	0.0%	44.0%	0.0%
Paper	16.5%	45.2%	98.4%	41.0%	16.4%	11.3%	30.9%	46.1%	19.5%	14.3%
Textiles	4.0%	0.0%	0.0%	0.0%	2.4%	1.0%	6.2%	0.0%	0.0%	14.0%
Green waste (vegetation)	2.7%	0.0%	0.0%	1.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grass/wood/bamboo	0.0%	12.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Plastic	25.1%	19.1%	1.1%	25.5%	32.1%	15.3%	36.3%	41.2%	18.3%	15.1%
Rubber/leather	0.0%	1.8%	0.0%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Metal	5.4%	2.5%	0.5%	5.5%	2.9%	1.1%	3.3%	5.9%	3.6%	3.8%
Bottles/glass	16.0%	3.2%	0.0%	8.5%	8.0%	37.3%	6.6%	6.8%	12.0%	11.1%
Soil/stones/ceramics	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Ash from heating appliances	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Others	0.5%	4.7%	0.0%	2.1%	14.0%	3.0%	0.0%	0.0%	2.6%	41.7%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Kitchen waste, Green waste and Grass/wood/bamboo	32.5%	23.5%	0.0%	16.3%	24.1%	31.0%	16.6%	0.0%	44.0%	0.0%

(2) Estimating the physical composition considering 'the discharge amount of each source

The table above shows the physical composition of each discharge source. If all discharges from each source were equal, the above values would be the physical composition of the discharged waste.

However, the waste collected is a mixture from each discharge source. To reproduce the physical composition of the waste in this state, JET estimated the physical composition of the waste as it is collected by performing a weighted average of the results of the physical composition analysis using the amount of waste discharged from each discharge source. The results are shown below.

i. Household waste

Table 4-37: Amount of household waste discharged by type of material (Suhareka)

Unit: ton/day	Winter				Summer				Overall
Income group	High income	Middle income	Low income	Total	High income	Middle income	Low income	Total	
Kitchen waste	10.2	4.2	0.7	15.1	5.8	3.7	0.9	10.4	25.5
Paper	2.0	0.4	0.1	2.5	1.2	0.5	0.1	1.8	4.3
Textiles	0.7	0.3	0.1	1.1	0.4	0.1	0.0	0.5	1.6
Green waste (vegetation)	2.4	0.5	0.2	3.1	0.3	0.9	0.3	1.5	4.6
Grass/wood/bamboo	0.0	1.2	0.1	1.3	0.0	0.0	0.0	0.0	1.3
Plastic	2.4	1.1	0.0	3.5	3.2	1.4	0.4	5.0	8.5
Rubber/leather	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1
Metal	0.3	0.1	0.0	0.4	0.3	0.1	0.0	0.4	0.8
Bottles/glass	0.4	0.1	0.0	0.5	0.5	0.5	0.0	1.0	1.5
Soil/stones/ceramics	0.2	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.2
Ash from heating appliances	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Others	1.6	0.1	0.1	1.8	0.5	0.4	0.0	0.9	2.7
Total	20.2	8.1	1.3	29.6	12.2	7.6	1.7	21.5	51.1
Kitchen waste, Green waste and Grass/wood/bamboo	12.6	5.9	1.0	19.5	6.1	4.6	1.2	11.9	31.4

Table 4-38: Physical composition of household waste considering the amount discharged by type of material (Suhareka)

	Winter				Summer				Overall
Income group	High income	Middle income	Low income	Total	High income	Middle income	Low income	Total	
Kitchen waste	50.5%	51.9%	53.8%	51.0%	47.5%	48.7%	52.9%	48.4%	49.9%
Paper	9.9%	4.9%	7.7%	8.4%	9.8%	6.6%	5.9%	8.4%	8.4%
Textiles	3.5%	3.7%	7.7%	3.7%	3.3%	1.3%	0.0%	2.3%	3.1%
Green waste (vegetation)	11.9%	6.2%	15.4%	10.5%	2.5%	11.8%	17.6%	7.0%	9.0%
Grass/wood/bamboo	0.0%	14.8%	7.7%	4.4%	0.0%	0.0%	0.0%	0.0%	2.5%
Plastic	11.9%	13.6%	0.0%	11.8%	26.2%	18.4%	23.5%	23.3%	16.6%
Rubber/leather	0.0%	1.2%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.2%
Metal	1.5%	1.2%	0.0%	1.4%	2.5%	1.3%	0.0%	1.9%	1.6%
Bottles/glass	2.0%	1.2%	0.0%	1.7%	4.1%	6.6%	0.0%	4.7%	2.9%
Soil/stones/ceramics	1.0%	0.0%	0.0%	0.7%	0.0%	0.0%	0.0%	0.0%	0.4%
Ash from heating appliances	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Others	7.9%	1.2%	7.7%	6.1%	4.1%	5.3%	0.0%	4.2%	5.3%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Kitchen waste, Green waste and Grass/wood/bamboo	62.4%	72.8%	76.9%	65.9%	50.0%	60.5%	70.6%	55.3%	61.4%

ii. Non-household waste

Table 4-39: Amount of non-household waste discharged by type of material (Suhareka)

Unit: ton/day	Winter						Summer						Overall
Category	Restaurants	Other businesses	Institutions	Markets	Street sweeping	Total	Restaurants	Other businesses	Institutions	Markets	Street sweeping	Total	
Kitchen waste	1.9	0.6	0.0	0.3	0.0	2.8	0.0	1.3	0.0	0.0	0.0	1.3	4.1
Paper	1.0	2.3	0.8	0.7	0.0	4.8	1.8	0.6	0.1	0.0	0.0	2.5	7.3
Textiles	0.2	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.1	0.0	0.0	0.1	0.3
Green waste (vegetation)	0.2	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Grass/wood/bamboo	0.0	0.6	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6
Plastic	1.6	1.0	0.0	0.5	0.0	3.1	1.6	0.6	0.1	0.0	0.0	2.3	5.4
Rubber/leather	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Metal	0.3	0.1	0.0	0.1	0.0	0.5	0.2	0.1	0.0	0.0	0.0	0.3	0.8
Bottles/glass	1.0	0.2	0.0	0.2	0.0	1.4	0.3	0.4	0.1	0.0	0.0	0.8	2.2
Soil/stones/ceramics	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ash from heating appliances	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Others	0.0	0.2	0.0	0.0	0.0	0.2	0.0	0.1	0.3	0.0	0.0	0.4	0.6
Total	6.2	5.1	0.8	1.8	0.0	13.9	3.9	3.1	0.7	0.0	0.0	7.7	21.6
Kitchen waste, Green waste and Grass/wood/bamboo	2.1	1.2	0.0	0.3	0.0	3.6	0.0	1.3	0.0	0.0	0.0	1.3	4.9

Table 4-40: Physical composition of non-household waste considering discharge amount by composition (Suhareka)

Season	Winter						Summer						Overall
Category	Restaurants	Other businesses	Institutions	Markets	Street sweeping	Total	Restaurants	Other businesses	Institutions	Markets	Street sweeping	Total	
Kitchen waste	30.6%	11.8%	0.0%	16.7%	0.0%	20.1%	0.0%	41.9%	0.0%	0.0%	0.0%	16.9%	19.0%
Paper	16.1%	45.1%	100.0%	38.9%	0.0%	34.5%	46.2%	19.4%	14.3%	0.0%	0.0%	32.5%	33.8%
Textiles	3.2%	0.0%	0.0%	0.0%	0.0%	1.4%	0.0%	0.0%	14.3%	0.0%	0.0%	1.3%	1.4%
Green waste (vegetation)	3.2%	0.0%	0.0%	0.0%	0.0%	1.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%
Grass/wood/bamboo	0.0%	11.8%	0.0%	0.0%	0.0%	4.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.8%
Plastic	25.8%	19.6%	0.0%	27.8%	0.0%	22.3%	41.0%	19.4%	14.3%	0.0%	0.0%	29.9%	25.0%
Rubber/leather	0.0%	2.0%	0.0%	0.0%	0.0%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%
Metal	4.8%	2.0%	0.0%	5.6%	0.0%	3.6%	5.1%	3.2%	0.0%	0.0%	0.0%	3.9%	3.7%
Bottles/glass	16.1%	3.9%	0.0%	11.1%	0.0%	10.1%	7.7%	12.9%	14.3%	0.0%	0.0%	10.4%	10.2%
Soil/stones/ceramics	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Ash from heating appliances	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Others	0.0%	3.9%	0.0%	0.0%	0.0%	1.4%	0.0%	3.2%	42.9%	0.0%	0.0%	5.2%	2.8%
Total	100.0%	100.0%	100.0%	100.0%	0.0%	100.0%	100.0%	100.0%	100.0%	0.0%	0.0%	100.0%	100.0%
Kitchen waste, Green waste and Grass/wood/bamboo	33.9%	23.5%	0.0%	16.7%	0.0%	25.9%	0.0%	41.9%	0.0%	0.0%	0.0%	16.9%	22.7%

Table 4-41: Summary of physical composition (Suhareka)

Season	Winter				Summer				Winter and Summer			
Category	Household (ton/day)	Other than household (ton/day)	Total (ton/day)	Weighted average Composition	Household (ton/day)	Other than household (ton/day)	Total (ton/day)	Weighted average Composition	Total (ton/day)	Overall composition	Average amount (ton/day)	Average composition
Kitchen waste	15.1	2.8	17.9	41.1%	10.4	1.3	11.7	40.1%	29.6	40.7%	14.8	40.7%
Paper	2.5	4.8	7.3	16.8%	1.8	2.5	4.3	14.7%	11.6	16.0%	5.8	16.0%
Textiles	1.1	0.2	1.3	3.0%	0.5	0.1	0.6	2.1%	1.9	2.6%	1.0	2.6%
Green waste (vegetation)	3.1	0.2	3.3	7.6%	1.5	0.0	1.5	5.1%	4.8	6.6%	2.4	6.6%
Grass/wood/bamboo	1.3	0.6	1.9	4.4%	0.0	0.0	0.0	0.0%	1.9	2.6%	1.0	2.6%
Plastic	3.5	3.1	6.6	15.2%	5.0	2.3	7.3	25.0%	13.9	19.1%	7.0	19.1%
Rubber/leather	0.1	0.1	0.2	0.5%	0.0	0.0	0.0	0.0%	0.2	0.3%	0.1	0.3%
Metal	0.4	0.5	0.9	2.1%	0.4	0.3	0.7	2.4%	1.6	2.2%	0.8	2.2%
Bottles/glass	0.5	1.4	1.9	4.4%	1.0	0.8	1.8	6.2%	3.7	5.1%	1.9	5.1%
Soil/stones/ceramics	0.2	0.0	0.2	0.5%	0.0	0.0	0.0	0.0%	0.2	0.3%	0.1	0.3%
Ash from heating appliances	0.0	0.0	0.0	0.0%	0.0	0.0	0.0	0.0%	0.0	0.0%	0.0	0.0%
Others	1.8	0.2	2.0	4.6%	0.9	0.4	1.3	4.5%	3.3	4.5%	1.7	4.5%
Total	29.6	13.9	43.5	100.0%	21.5	7.7	29.2	100.0%	72.7	100.0%	36.4	100.0%
Kitchen waste, Green waste and Grass/wood/bamboo	19.5	3.6	23.1	53.1%	11.9	1.3	13.2	45.2%	36.3	49.9%	18.2	49.9%

b.3 Rahovec

(1) Measured values

The samples of the waste amount survey were divided into four quadrants and analyzed for physical composition.

i. Household waste

The physical composition of household waste was analyzed by income group.

Table 4-42: Physical composition of household waste (Rahovec)

Season	Winter			Summer		
Income group	High income	Middle income	Low income	High income	Middle income	Low income
Kitchen waste	54.3%	37.9%	60.0%	61.8%	52.5%	41.6%
Paper	6.6%	7.1%	5.4%	8.7%	6.1%	10.2%
Textiles	7.0%	2.6%	4.3%	5.0%	2.2%	6.8%
Green waste (vegetation)	3.1%	21.4%	2.8%	0.3%	9.7%	6.6%
Grass/wood/bamboo	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Plastic	15.8%	12.9%	15.9%	17.0%	18.8%	23.5%
Rubber/leather	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Metal	2.3%	0.9%	0.9%	1.5%	1.3%	2.3%
Bottles/glass	3.5%	3.1%	2.0%	3.5%	6.7%	4.5%
Soil/stones/ceramics	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Ash from heating appliances	0.5%	8.1%	2.7%	0.0%	0.0%	0.0%
Others	6.7%	6.0%	6.0%	2.1%	2.5%	4.5%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Kitchen waste, Green waste and Grass/wood/bamboo	57.5%	59.3%	62.8%	62.2%	62.3%	48.2%

ii. Non-household waste

For non-household waste, the analysis was based on the categories in the table below.

Table 4-43: Physical composition of non-household waste (Rahovec)

Season	Winter					Summer				
Category	Restaurants	Other businesses	Institutions	Markets	Street sweeping	Restaurants	Other businesses	Institutions	Markets	Street sweeping
Kitchen waste	5.7%	31.2%	19.5%	35.7%	1.2%	36.0%	13.1%	3.4%	6.9%	0.0%
Paper	17.1%	15.0%	36.4%	34.4%	19.5%	16.0%	24.0%	59.3%	36.5%	8.0%
Textiles	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%	0.0%	0.0%	5.3%
Green waste (vegetation)	0.0%	0.0%	8.8%	0.0%	24.9%	0.0%	0.0%	0.0%	0.0%	5.7%
Grass/wood/bamboo	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%
Plastic	13.4%	24.3%	23.9%	20.9%	20.4%	13.7%	23.3%	29.4%	36.7%	52.7%
Rubber/leather	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Metal	1.7%	1.2%	1.3%	7.0%	3.3%	9.2%	6.7%	5.5%	11.1%	20.4%
Bottles/glass	42.2%	25.6%	5.0%	2.1%	20.3%	25.2%	29.0%	0.0%	7.6%	7.9%
Soil/stones/ceramics	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Ash from heating appliance	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Others	19.9%	2.6%	5.1%	0.0%	10.0%	0.0%	2.8%	2.5%	1.3%	0.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Kitchen waste, Green waste and Grass/wood/bamboo	5.7%	31.2%	28.2%	35.7%	26.5%	36.0%	13.1%	3.4%	6.9%	5.7%

(2) Estimating the physical composition considering the discharge amount of each source

The table above shows the physical composition of each discharge source. If all discharges from each source were equal, the above values would be the physical composition of the discharged waste.

However, the waste collected is a mixture from each discharge source. To reproduce the physical composition of the waste in this state, JET estimated the physical composition of the waste as it is collected by performing a weighted average of the results of the physical composition analysis using the amount of waste discharged from each discharge source. The results are shown below.

i. Household waste

Table 4-44: Amount of household waste discharged by type of material (Rahovec)

Unit: ton/day	Winter				Summer				Overall
Income group	High income	Middle income	Low income	Total	High income	Middle income	Low income	Total	
Kitchen waste	13.8	3.1	0.7	17.6	7.7	3.3	0.5	11.5	29.1
Paper	1.7	0.6	0.1	2.4	1.1	0.4	0.1	1.6	4.0
Textiles	1.8	0.2	0.1	2.1	0.6	0.1	0.1	0.8	2.9
Green waste (vegetation)	0.8	1.7	0.0	2.5	0.0	0.6	0.1	0.7	3.2
Grass/wood/bamboo	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Plastic	4.0	1.0	0.2	5.2	2.1	1.2	0.3	3.6	8.8
Rubber/leather	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Metal	0.6	0.1	0.0	0.7	0.2	0.1	0.0	0.3	1.0
Bottles/glass	0.9	0.2	0.0	1.1	0.4	0.4	0.1	0.9	2.0
Soil/stones/ceramics	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ash from heating appliances	0.1	0.7	0.0	0.8	0.0	0.0	0.0	0.0	0.8
Others	1.7	0.5	0.1	2.3	0.3	0.2	0.1	0.6	2.9
Total	25.4	8.1	1.2	34.7	12.4	6.3	1.3	20.0	54.7
Kitchen waste, Green waste and Grass/wood/bamboo	14.6	4.8	0.7	20.1	7.7	3.9	0.6	12.2	32.3

Table 4-45: Physical composition of household waste considering the amount discharged by type of material (Rahovec)

	Winter				Summer				Overall
Income group	High income	Middle income	Low income	Total	High income	Middle income	Low income	Total	
Kitchen waste	54.3%	38.3%	58.3%	50.7%	62.1%	52.4%	38.5%	57.5%	53.2%
Paper	6.7%	7.4%	8.3%	6.9%	8.9%	6.3%	7.7%	8.0%	7.3%
Textiles	7.1%	2.5%	8.3%	6.1%	4.8%	1.6%	7.7%	4.0%	5.3%
Green waste (vegetation)	3.1%	21.0%	0.0%	7.2%	0.0%	9.5%	7.7%	3.5%	5.9%
Grass/wood/bamboo	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Plastic	15.7%	12.3%	16.7%	15.0%	16.9%	19.0%	23.1%	18.0%	16.1%
Rubber/leather	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Metal	2.4%	1.2%	0.0%	2.0%	1.6%	1.6%	0.0%	1.5%	1.8%
Bottles/glass	3.5%	2.5%	0.0%	3.2%	3.2%	6.3%	7.7%	4.5%	3.7%
Soil/stones/ceramics	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Ash from heating appliances	0.4%	8.6%	0.0%	2.3%	0.0%	0.0%	0.0%	0.0%	1.5%
Others	6.7%	6.2%	8.3%	6.6%	2.4%	3.2%	7.7%	3.0%	5.3%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Kitchen waste, Green waste and Grass/wood/bamboo	57.5%	59.3%	58.3%	57.9%	62.1%	61.9%	46.2%	61.0%	59.0%

ii. Non-household waste

Table 4-46: Amount of non-household waste discharged by type of material (Rahovec)

Unit: ton/day	Winter						Summer						Overall
Category	Restaurants	Other businesses	Institutions	Markets	Street sweeping	Total	Restaurants	Other businesses	Institutions	Markets	Street sweeping	Total	
Kitchen waste	0.2	2.4	0.7	0.3	0.0	3.6	1.7	1.3	0.0	0.0	0.0	3.0	6.6
Paper	0.7	1.2	1.3	0.3	0.0	3.5	0.8	2.3	0.9	0.2	0.0	4.2	7.7
Textiles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1
Green waste (vegetation)	0.0	0.0	0.3	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Grass/wood/bamboo	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Plastic	0.5	1.9	0.9	0.2	0.0	3.5	0.6	2.2	0.4	0.2	0.0	3.4	6.9
Rubber/leather	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Metal	0.1	0.1	0.0	0.1	0.0	0.3	0.4	0.6	0.1	0.1	0.0	1.2	1.5
Bottles/glass	1.7	2.0	0.2	0.0	0.0	3.9	1.2	2.8	0.0	0.0	0.0	4.0	7.9
Soil/stones/ceramics	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ash from heating appliances	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Others	0.8	0.2	0.2	0.0	0.0	1.2	0.0	0.3	0.0	0.0	0.0	0.3	1.5
Total	4.0	7.8	3.6	0.9	0.0	16.3	4.7	9.6	1.4	0.5	0.0	16.2	32.5
Kitchen waste, Green waste and Grass/wood/bamboo	0.2	2.4	1.0	0.3	0.0	3.9	1.7	1.3	0.0	0.0	0.0	3.0	6.9

Table 4-47: Physical composition of non-household waste considering discharge amount by composition (Rahovec)

Season	Winter						Summer						Overall
Category	Restaurants	Other businesses	Institutions	Markets	Street sweeping	Total	Restaurants	Other businesses	Institutions	Markets	Street sweeping	Total	
Kitchen waste	5.0%	30.8%	19.4%	33.3%	0.0%	22.1%	36.2%	13.5%	0.0%	0.0%	0.0%	18.5%	20.3%
Paper	17.5%	15.4%	36.1%	33.3%	0.0%	21.5%	17.0%	24.0%	64.3%	40.0%	0.0%	25.9%	23.7%
Textiles	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	0.0%	0.0%	0.0%	0.6%	0.3%
Green waste (vegetation)	0.0%	0.0%	8.3%	0.0%	0.0%	1.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%
Grass/wood/bamboo	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Plastic	12.5%	24.4%	25.0%	22.2%	0.0%	21.5%	12.8%	22.9%	28.6%	40.0%	0.0%	21.0%	21.2%
Rubber/leather	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Metal	2.5%	1.3%	0.0%	11.1%	0.0%	1.8%	8.5%	6.3%	7.1%	20.0%	0.0%	7.4%	4.6%
Bottles/glass	42.5%	25.6%	5.6%	0.0%	0.0%	23.9%	25.5%	29.2%	0.0%	0.0%	0.0%	24.7%	24.3%
Soil/stones/ceramics	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Ash from heating appliances	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Others	20.0%	2.6%	5.6%	0.0%	0.0%	7.4%	0.0%	3.1%	0.0%	0.0%	0.0%	1.9%	4.6%
Total	100.0%	100.0%	100.0%	100.0%	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%	0.0%	100.0%	100.0%
Kitchen waste, Green waste and Grass/wood/bamboo	5.0%	30.8%	27.8%	33.3%	0.0%	23.9%	36.2%	13.5%	0.0%	0.0%	0.0%	18.5%	21.2%

Table 4-48: Summary of physical composition (Rahovec)

Season	Winter				Summer				Winter and Summer			
Category	Household (ton/day)	Other than household (ton/day)	Total (ton/day)	Weighted average Composition	Household (ton/day)	Other than household (ton/day)	Total (ton/day)	Weighted average Composition	Total (ton/day)	Overall composition	Average amount (ton/day)	Average composition
Kitchen waste	17.6	3.6	21.2	41.6%	11.5	3.0	14.5	40.1%	35.7	40.9%	17.9	40.9%
Paper	2.4	3.5	5.9	11.6%	1.6	4.2	5.8	16.0%	11.7	13.4%	5.9	13.4%
Textiles	2.1	0.0	2.1	4.1%	0.8	0.1	0.9	2.5%	3.0	3.4%	1.5	3.4%
Green waste (vegetation)	2.5	0.3	2.8	5.5%	0.7	0.0	0.7	1.9%	3.5	4.0%	1.8	4.0%
Grass/wood/bamboo	0.0	0.0	0.0	0.0%	0.0	0.0	0.0	0.0%	0.0	0.0%	0.0	0.0%
Plastic	5.2	3.5	8.7	17.1%	3.6	3.4	7.0	19.3%	15.7	18.0%	7.9	18.0%
Rubber/leather	0.0	0.0	0.0	0.0%	0.0	0.0	0.0	0.0%	0.0	0.0%	0.0	0.0%
Metal	0.7	0.3	1.0	2.0%	0.3	1.2	1.5	4.1%	2.5	2.9%	1.3	2.9%
Bottles/glass	1.1	3.9	5.0	9.8%	0.9	4.0	4.9	13.5%	9.9	11.4%	5.0	11.4%
Soil/stones/ceramics	0.0	0.0	0.0	0.0%	0.0	0.0	0.0	0.0%	0.0	0.0%	0.0	0.0%
Ash from heating appliances	0.8	0.0	0.8	1.6%	0.0	0.0	0.0	0.0%	0.8	0.9%	0.4	0.9%
Others	2.3	1.2	3.5	6.9%	0.6	0.3	0.9	2.5%	4.4	5.0%	2.2	5.0%
Total	34.7	16.3	51.0	100.0%	20.0	16.2	36.2	100.0%	87.2	100.0%	43.6	100.0%
Kitchen waste, Green waste and Grass/wood/bamboo	20.1	3.9	24.0	47.1%	12.2	3.0	15.2	42.0%	39.2	45.0%	19.6	45.0%

b.4 Dragash

(1) Measured values

The samples of the waste amount survey were divided into four quadrants and analyzed for physical composition.

i. Household waste

The physical composition of household waste was analyzed by income group.

Table 4-49: Physical composition of household waste (Dragash)

Season	Winter			Summer		
Income group	High income	Middle income	Low income	High income	Middle income	Low income
Kitchen waste	52.9%	47.6%	40.6%	41.9%	50.1%	53.6%
Paper	8.2%	9.8%	6.9%	10.6%	10.6%	6.1%
Textiles	7.0%	8.4%	2.5%	3.6%	4.9%	5.6%
Green waste (vegetation)	5.2%	6.7%	12.8%	0.8%	1.8%	2.6%
Grass/wood/bamboo	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Plastic	14.7%	19.4%	19.3%	22.3%	22.5%	19.9%
Rubber/leather	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Metal	0.7%	1.0%	0.4%	2.8%	2.9%	3.6%
Bottles/glass	8.1%	2.9%	1.7%	8.9%	6.2%	5.3%
Soil/stones/ceramics	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Ash from heating appliances	0.0%	1.5%	3.3%	0.0%	0.0%	0.0%
Others	3.2%	2.6%	12.5%	9.2%	1.0%	3.4%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Kitchen waste, Green waste and Grass/wood/bamboo	58.1%	54.3%	53.4%	42.7%	51.9%	56.2%

ii. Non-household waste

For non-household waste, the analysis was based on the categories in the table below.

Table 4-50: Physical composition of non-household waste (Dragash)

Season	Winter					Summer				
Category	Restaurants	Other businesses	Institutions	Markets	Street sweeping	Restaurants	Other businesses	Institutions	Markets	Street sweeping
Kitchen waste	34.0%	0.0%	4.9%	12.3%	0.0%	41.7%	0.0%	0.0%	28.7%	0.0%
Paper	18.9%	19.2%	58.5%	33.2%	11.5%	13.4%	19.5%	53.4%	32.3%	17.5%
Textiles	2.2%	0.8%	0.0%	3.6%	0.0%	0.0%	0.0%	0.0%	0.0%	10.0%
Green waste (vegetation)	0.0%	0.0%	0.0%	0.0%	57.2%	1.4%	0.0%	0.0%	0.0%	0.9%
Grass/wood/bamboo	0.0%	0.0%	7.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Plastic	9.7%	23.0%	23.5%	26.7%	20.0%	20.5%	17.3%	12.5%	27.9%	25.6%
Rubber/leather	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Metal	1.7%	1.9%	3.2%	3.2%	1.0%	2.8%	6.3%	7.3%	0.9%	0.8%
Bottles/glass	20.2%	37.4%	1.6%	18.7%	6.5%	20.2%	32.2%	10.5%	3.9%	3.1%
Soil/stones/ceramics	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Ash from heating appliances	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Others	13.3%	17.7%	1.1%	2.2%	3.7%	0.0%	24.6%	16.4%	6.3%	42.1%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Kitchen waste, Green waste and Grass/wood/bamboo	34.0%	0.0%	12.0%	12.3%	57.2%	43.1%	0.0%	0.0%	28.7%	0.9%

(2) Estimating the physical composition considering the discharge amount of each source

The table above shows the physical composition of each discharge source. If all discharges from each source were equal, the above values would be the physical composition of the discharged waste.

However, the waste collected is a mixture from each discharge source. To reproduce the physical composition of the waste in this state, JET estimated the physical composition of the waste as it is collected by performing a weighted average of the results of the physical composition analysis using the amount of waste discharged from each discharge source. The results are shown below.

i. Household waste

Table 4-51: Amount of household waste discharged by type of material (Dragash)

Unit: ton/day	Winter				Summer				Overall
Income group	High income	Middle income	Low income	Total	High income	Middle income	Low income	Total	
Kitchen waste	6.2	1.5	0.3	8.0	4.2	1.5	0.5	6.2	14.2
Paper	1.0	0.3	0.1	1.4	1.1	0.3	0.1	1.5	2.9
Textiles	0.8	0.3	0.0	1.1	0.4	0.1	0.1	0.6	1.7
Green waste (vegetation)	0.6	0.2	0.1	0.9	0.1	0.1	0.0	0.2	1.1
Grass/wood/bamboo	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Plastic	1.7	0.6	0.1	2.4	2.2	0.7	0.2	3.1	5.5
Rubber/leather	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Metal	0.1	0.0	0.0	0.1	0.3	0.1	0.0	0.4	0.5
Bottles/glass	0.9	0.1	0.0	1.0	0.9	0.2	0.0	1.1	2.1
Soil/stones/ceramics	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ash from heating appliances	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Others	0.4	0.1	0.1	0.6	0.9	0.0	0.0	0.9	1.5
Total	11.7	3.1	0.7	15.5	10.1	3.0	0.9	14.0	29.5
Kitchen waste, Green waste and Grass/wood/bamboo	6.8	1.7	0.4	8.9	4.3	1.6	0.5	6.4	15.3

Table 4-52: Physical composition of household waste considering the amount discharged by type of material (Dragash)

	Winter				Summer				Overall
Income group	High income	Middle income	Low income	Total	High income	Middle income	Low income	Total	
Kitchen waste	53.0%	48.4%	42.9%	51.6%	41.6%	50.0%	55.6%	44.3%	48.1%
Paper	8.5%	9.7%	14.3%	9.0%	10.9%	10.0%	11.1%	10.7%	9.8%
Textiles	6.8%	9.7%	0.0%	7.1%	4.0%	3.3%	11.1%	4.3%	5.8%
Green waste (vegetation)	5.1%	6.5%	14.3%	5.8%	1.0%	3.3%	0.0%	1.4%	3.7%
Grass/wood/bamboo	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Plastic	14.5%	19.4%	14.3%	15.5%	21.8%	23.3%	22.2%	22.1%	18.6%
Rubber/leather	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Metal	0.9%	0.0%	0.0%	0.6%	3.0%	3.3%	0.0%	2.9%	1.7%
Bottles/glass	7.7%	3.2%	0.0%	6.5%	8.9%	6.7%	0.0%	7.9%	7.1%
Soil/stones/ceramics	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Ash from heating appliances	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Others	3.4%	3.2%	14.3%	3.9%	8.9%	0.0%	0.0%	6.4%	5.1%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Kitchen waste, Green waste and Grass/wood/bamboo	58.1%	54.8%	57.1%	57.4%	42.6%	53.3%	55.6%	45.7%	51.9%

ii. Non-household waste

Table 4-53: Amount of non-household waste discharged by type of material (Dragash)

Unit: ton/day	Winter						Summer						Overall
Category	Restaurants	Other businesses	Institutions	Markets	Street sweeping	Total	Restaurants	Other businesses	Institutions	Markets	Street sweeping	Total	
Kitchen waste	0.5	0.0	0.0	0.1	0.0	0.6	0.7	0.0	0.0	0.3	0.0	1.0	1.6
Paper	0.3	0.8	0.4	0.3	0.0	1.8	0.2	0.7	0.3	0.3	0.0	1.5	3.3
Textiles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Green waste (vegetation)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grass/wood/bamboo	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Plastic	0.1	1.0	0.1	0.2	0.0	1.4	0.3	0.6	0.1	0.2	0.0	1.2	2.6
Rubber/leather	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Metal	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.2	0.3
Bottles/glass	0.3	1.6	0.0	0.2	0.0	2.1	0.3	1.1	0.1	0.0	0.0	1.5	3.6
Soil/stones/ceramics	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ash from heating appliances	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Others	0.2	0.8	0.0	0.0	0.0	1.0	0.0	0.9	0.1	0.1	0.0	1.1	2.1
Total	1.4	4.3	0.5	0.8	0.0	7.0	1.5	3.5	0.6	0.9	0.0	6.5	13.5
Kitchen waste, Green waste and Grass/wood/bamboo	0.5	0.0	0.0	0.1	0.0	0.6	0.7	0.0	0.0	0.3	0.0	1.0	1.6

Table 4-54: Physical composition of non-household waste considering the amount discharged by type of material (Dragash)

Season	Winter						Summer						Overall
Category	Restaurants	Other businesses	Institutions	Markets	Street sweeping	Total	Restaurants	Other businesses	Institutions	Markets	Street sweeping	Total	
Kitchen waste	35.7%	0.0%	0.0%	12.5%	0.0%	8.6%	46.7%	0.0%	0.0%	33.3%	0.0%	15.4%	11.9%
Paper	21.4%	18.6%	80.0%	37.5%	0.0%	25.7%	13.3%	20.0%	50.0%	33.3%	0.0%	23.1%	24.4%
Textiles	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Green waste (vegetation)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grass/wood/bamboo	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Plastic	7.1%	23.3%	20.0%	25.0%	0.0%	20.0%	20.0%	17.1%	16.7%	22.2%	0.0%	18.5%	19.3%
Rubber/leather	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Metal	0.0%	2.3%	0.0%	0.0%	0.0%	1.4%	0.0%	5.7%	0.0%	0.0%	0.0%	3.1%	2.2%
Bottles/glass	21.4%	37.2%	0.0%	25.0%	0.0%	30.0%	20.0%	31.4%	16.7%	0.0%	0.0%	23.1%	26.7%
Soil/stones/ceramics	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Ash from heating appliances	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Others	14.3%	18.6%	0.0%	0.0%	0.0%	14.3%	0.0%	25.7%	16.7%	11.1%	0.0%	16.9%	15.6%
Total	100.0%	100.0%	100.0%	100.0%	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%	0.0%	100.0%	100.0%
Kitchen waste, Green waste and Grass/wood/bamboo	35.7%	0.0%	0.0%	12.5%	0.0%	8.6%	46.7%	0.0%	0.0%	33.3%	0.0%	15.4%	11.9%

Table 4-55: Summary of physical composition (Dragash)

Season	Winter				Summer				Winter and Summer			
Category	Household (ton/day)	Other than household (ton/day)	Total (ton/day)	Weighted average Composition	Household (ton/day)	Other than household (ton/day)	Total (ton/day)	Weighted average Composition	Total (ton/day)	Overall composition	Average amount (ton/day)	Average composition
Kitchen waste	8.0	0.6	8.6	38.2%	6.2	1.0	7.2	35.1%	15.8	36.7%	7.9	36.7%
Paper	1.4	1.8	3.2	14.2%	1.5	1.5	3.0	14.6%	6.2	14.4%	3.1	14.4%
Textiles	1.1	0.0	1.1	4.9%	0.6	0.0	0.6	2.9%	1.7	4.0%	0.9	4.0%
Green waste (vegetation)	0.9	0.0	0.9	4.0%	0.2	0.0	0.2	1.0%	1.1	2.6%	0.6	2.6%
Grass/wood/bamboo	0.0	0.0	0.0	0.0%	0.0	0.0	0.0	0.0%	0.0	0.0%	0.0	0.0%
Plastic	2.4	1.4	3.8	16.9%	3.1	1.2	4.3	21.0%	8.1	18.8%	4.1	18.8%
Rubber/leather	0.0	0.0	0.0	0.0%	0.0	0.0	0.0	0.0%	0.0	0.0%	0.0	0.0%
Metal	0.1	0.1	0.2	0.9%	0.4	0.2	0.6	2.9%	0.8	1.9%	0.4	1.9%
Bottles/glass	1.0	2.1	3.1	13.8%	1.1	1.5	2.6	12.7%	5.7	13.3%	2.9	13.3%
Soil/stones/ceramics	0.0	0.0	0.0	0.0%	0.0	0.0	0.0	0.0%	0.0	0.0%	0.0	0.0%
Ash from heating appliances	0.0	0.0	0.0	0.0%	0.0	0.0	0.0	0.0%	0.0	0.0%	0.0	0.0%
Others	0.6	1.0	1.6	7.1%	0.9	1.1	2.0	9.8%	3.6	8.4%	1.8	8.4%
Total	15.5	7.0	22.5	100.0%	14.0	6.5	20.5	100.0%	43.0	100.0%	21.5	100.0%
Kitchen waste, Green waste and Grass/wood/bamboo	8.9	0.6	9.5	42.2%	6.4	1.0	7.4	36.1%	16.9	39.3%	8.5	39.3%

c. C/N ratio (carbon to nitrogen ratio)

The carbon/nitrogen ratio is essential when considering waste composting. Therefore, the C/N ratio was analyzed in this study. The results are shown below.

Table 4-56: C/N ratio (carbon to nitrogen ratio) (Winter)

	Malisheva			Suhareka			Rahovec			Dragash		
	C (%)	N (%)	C/N	C (%)	N (%)	C/N	C (%)	N (%)	C/N	C (%)	N (%)	C/N
Households (average)	11.0	1.0	11.0	30.0	0.7	42.9	10.5	0.5	21.0	26.4	0.5	52.8
High income	15.3	0.5	30.6	29.5	0.6	49.2	7.6	0.6	12.7	28.1	0.5	56.2
Middle income	9.7	0.5	19.4	31.5	0.7	45.0	17.4	0.6	29.0	30.8	0.6	51.3
Low income	7.6	0.5	15.2	29.0	0.7	41.4	6.4	0.2	32.0	20.2	0.5	40.4
Restaurants	38.1	0.6	63.5	41.0	0.7	58.6	47.8	0.6	79.7	49.9	0.8	62.4
Other businesses	40.9	0.8	51.1	39.5	0.8	49.4	38.9	0.6	64.8	51.2	0.9	56.9
Institutions	14.3	0.7	20.4	18.7	0.6	31.2	31.6	0.7	45.1	36.9	0.6	61.5
Markets	25.1	0.5	50.2	NA*	NA*	NA*	30.6	0.5	61.2	25.2	0.6	42.0
Street sweeping	4.7	0.6	7.8	50.6	0.9	56.2	28.6	0.7	40.9	13.1	0.4	32.8

*NA: Not Available

Table 4-57: C/N ratio (carbon to nitrogen ratio) (Summer)

	Malisheva			Suhareka			Rahovec			Dragash		
	C (%)	N (%)	C/N	C (%)	N (%)	C/N	C (%)	N (%)	C/N	C (%)	N (%)	C/N
Households (average)	23.3	1.4	16.6	25.7	1.5	17.1	28.4	1.9	14.9	20.5	1.4	14.6
High income	20.7	1.2	17.3	32.6	2.2	14.8	21.8	1.6	13.6	24.5	1.5	16.3
Middle income	28.5	1.4	20.4	23.0	1.2	19.2	29.9	1.9	15.7	21.9	1.5	14.6
Low income	20.7	1.6	12.9	21.6	1.0	21.6	33.6	2.2	15.3	15.1	1.2	12.6
Restaurants	32.9	1.8	18.3	28.8	1.9	15.2	39.6	2.0	19.8	27.7	1.6	17.3
Other businesses	30.7	1.4	21.9	19.9	1.5	13.3	46.5	2.4	19.4	40.0	1.5	26.7
Institutions	27.0	1.2	22.5	17.7	0.9	19.7	36.7	2.5	14.7	9.2	0.4	23.0
Markets	24.8	1.2	20.7	15.1	1.4	10.8	21.9	1.1	19.9	26.1	1.6	16.3
Street sweeping	13.9	0.8	17.4	4.1	0.2	20.5	12.7	0.7	18.1	4.0	0.3	13.3

Table 4-58: C/N ratio (carbon to nitrogen ratio) (Winter and summer average)

	Malisheva			Suhareka			Rahovec			Dragash		
	C (%)	N (%)	C/N	C (%)	N (%)	C/N	C (%)	N (%)	C/N	C (%)	N (%)	C/N
Households (average)	17.2	1.2	14.3	27.9	1.1	25.3	19.5	1.2	16.2	23.5	1.0	24.7
High income	18.0	0.9	21.2	31.1	1.4	22.2	14.7	1.1	13.4	26.3	1.0	26.3
Middle income	19.1	1.0	20.1	27.3	1.0	28.7	23.7	1.3	18.9	26.4	1.1	25.1
Low income	14.2	1.1	13.5	25.3	0.9	29.8	20.0	1.2	16.7	17.7	0.9	20.8
Restaurants	35.5	1.2	29.6	34.9	1.3	26.8	43.7	1.3	33.6	38.8	1.2	32.3
Other businesses	35.8	1.1	32.5	29.7	1.2	25.8	42.7	1.5	28.5	45.6	1.2	38.0
Institutions	20.7	1.0	21.7	18.2	0.8	24.3	34.2	1.6	21.3	23.1	0.5	46.1
Markets	25.0	0.9	29.4	NA*	NA*	NA*	26.3	0.8	32.8	25.7	1.1	23.3
Street sweeping	9.3	0.7	13.3	27.3	0.6	49.7	20.7	0.7	29.5	8.6	0.4	24.4

*NA: Not Available

The appropriate C/N ratio for fertilizer is between 20 and 30. The direct application of waste exceeding 30 rapidly reduces the amount of oxygen in the soil, making the soil anaerobic and thus impairing the cultivation of crops.

The average C/N ratio of household waste in each municipality is between 14 and 24, which means that the waste can be used as fertilizer, but direct application of waste should be avoided for sanitary concerns due to the high possibility of insects and bacteria being present in the waste immediately after discharge. During the composting process, the temperature in the compost pile rises to about 60°C, many insects and bacteria are killed, and the C/N ratio becomes stable, resulting in a good fertilizer.

The primary nitrogen sources were grass clippings, plant trimmings, and fruit and vegetable scraps, which comprised the bulk of the waste sampled in the summer months. As a result, nitrogen in the feces was higher than in the winter months.

4.2.3 Public opinion survey 1

4.2.3.1 Outline of the survey

In the second phase, PP2: Improvement of waste collection system is being implemented in Brod village in Dragash, and prior to the start of the PP, a Public Opinion Survey (hereinafter referred to as "POS") was conducted among waste generators to understand the current status of waste management and the issues to be resolved in the village. A summary of the survey is as follows.

Table 4-59: Summary of POS

Survey name	POS for PP2: Improvement of waste collection system
Objectives	1) To understand the current status and challenges of waste management in Brod village before PP2 implementation. 2) To set a baseline to compare changes in awareness and behavior of Brod villagers before and after the implementation of PP2.
Target site	Brod village in Dragash
Sample quantity	245 households[1]
Survey period July 19 - August 26, 2022	
Survey method	Face-to-face interview with digital questionnaire
Number of questions	22
Survey items	- Respondent characteristics - Cell phone usage (degree of internet access) - Amount and method of self-disposal - Desires for waste collection services (frequency, methods, willingness to cooperate) - Financial burden (including willingness to pay) - Willingness to cooperate in waste separation - Handling of waste at home (gender perspective) - Methods of public awareness

4.2.3.2 Result of POS

A summary of the survey results is described below. For more information, see ANNEX 3: Public Opinion Survey.

a. Information on respondents

a.1 Distribution of respondents (Residential structure)

The target area was a mountainous region and 100% of the respondents were residents of detached houses. Of these, 48.6% were residents who live year-round in Brod, and 51.4% were members of the diaspora, or non-residents who have left Brod to live and work in other parts of Europe, and only return to their hometown during the summer vacation.

[1] With a normal distribution, the quantity that statistically gives a 95% confidence band from the number of households in Brod village.

a.2 Distribution of respondents (Age and Gender)

The largest age group was the 40-59 age group (46.5 %), and the gender ratio was almost exclusively male (94.7 %). The survey was conducted during daylight hours, including weekdays, and many men stay at home during the week due to poor access to cities and high unemployment rates.

a.3 Distribution of respondents (Monthly income)

The average monthly income of the respondents was between 600 and 1,000 euros (45.7%). The diaspora has the next highest percentage (34.1%) and is earning more, between 1,200 and 2,000 euros. Residents (Gora) have the third highest percentage, earning between 300 and 500 euros (31.1%).

Members of the diaspora are richer because they are migrants working abroad.

Table 4-60: Monthly income per household

Total income of your family: (EUR/month)						
	Gora	%	Diaspora	%	Total	%
Up to 250	21	17.65%	2	1.59%	23	9.39%
300 to 500	37	31.09%	18	14.29%	55	22.45%
600 - 1000	53	44.54%	59	46.82%	112	45.71%
1200 - 2000	7	5.88%	43	34.13%	50	20.41%
More than 2000	1	0.84%	4	3.17%	5	2.04%
Total	119	100.00%	126	100.00%	245	100.00%

a.4 Distribution of respondents (Ethnicity)

While 56.3% of all respondents were Bosnian (of Serbian descent) and the rest were Gorani, the proportions were markedly different when comparing residents (Gora) and non-residents (Diaspora), with 88.9% of the diaspora being Bosnian and 78.2% of Gora being Gorani people.

Table 4-61: Ethnicity

Ethnicity						
	Gora	%	Diaspora	%	Total	%
Gorani	93	78.15%	14	11.11%	107	43.67%
Bosnian	26	21.85%	112	88.89%	138	56.33%
Total	119	100.00%	126	100.00%	245	100.00%

b. Main findings and analysis

b.1 Questions related to waste collection services

(1) Current waste disposal methods and need for waste collection services

Almost all (98.8%) of the respondents in Brod village currently dispose of their garbage on the street, in the river, or in vacant lots, and all of them indicated that they need a waste collection service to a greater or lesser extent.

Almost half of the respondents (45.7%) perceived that the reason for the lack of collection service is that the Ekoregjioni refuses to provide it. Other topographical reasons (27.3%), such as narrow roads and distance from the center of the Municipality, and refusal of residents to accept the collection service (23.7%) were also identified as reasons for the lack of collection service. When we interviewed Dragash Municipality, we were

told that ethnic reasons were the main reason, but we found that this was not perceived to be the case in the field.

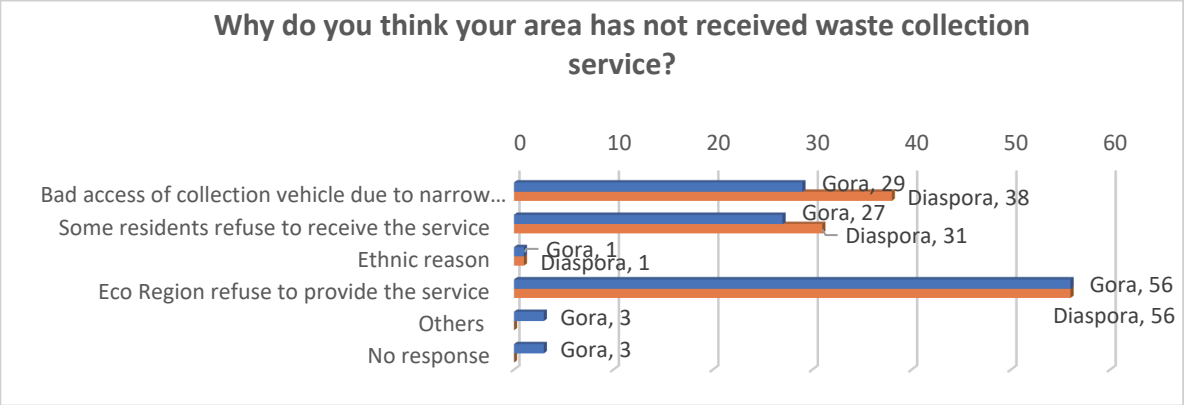


Figure 4-4: Reasons for no collection service

(2) Willingness to pay and amount

The willingness to pay for a collection service was high at 97.6%, with 65.7% willing to pay 3-5 EUR/household/month. Since the current collection fee in other regions is EUR 4.5, this is a reasonable amount.

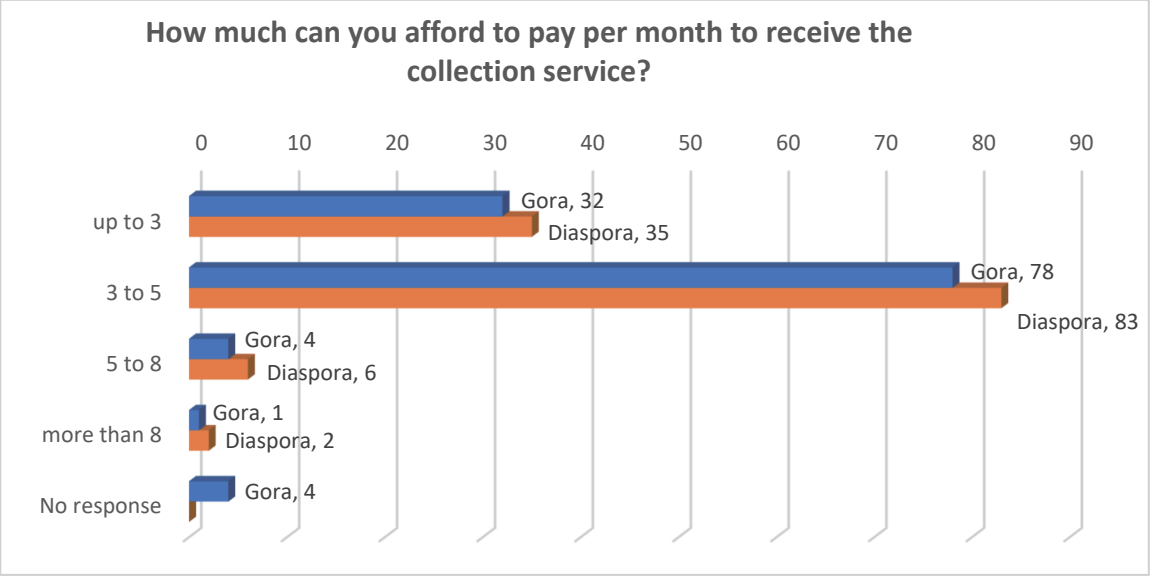


Figure 4-5: Willingness to pay and amount

(3) Collection frequency

With regard to the frequency of collection during the normal season, more than half (56.7%) of the respondents preferred twice a week. However, this figure increases to 80% during the summer season, when the diaspora returns home for vacation.

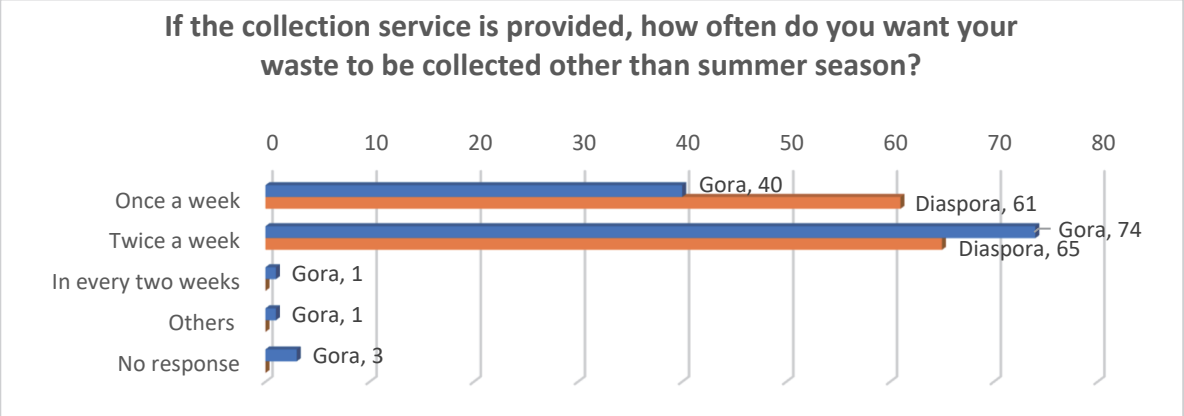


Figure 4-6: Frequency of waste collection requested during normal season

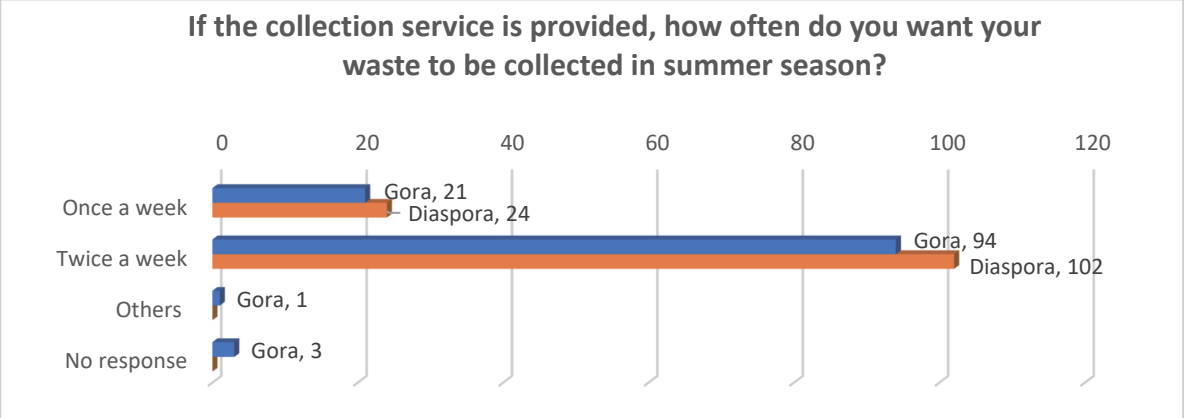


Figure 4-7: Frequency of waste collection requested during summer season

b.2 Questions about waste discharge

(1) Amount of waste generated

84.9% of respondents indicated that they generate only about one bucket of garbage per week. While more than half of the respondents preferred twice-weekly collection in the previous question, once-weekly collection is sufficient. With regard to the summer season, 60% of the respondents indicated that the amount of garbage doubles compared to the normal season, so measures need to be taken during the summer season.

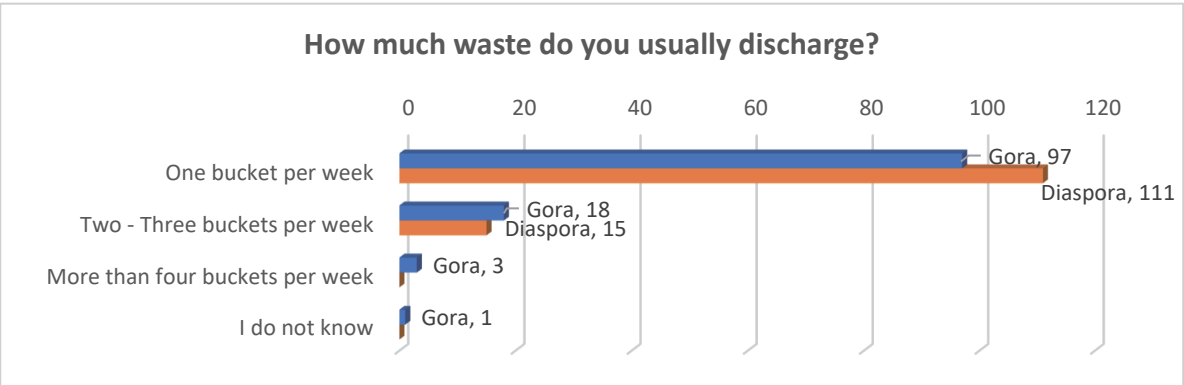


Figure 4-8: Waste generation amount

b.3 Questions about public awareness

(1) Methods of communication on waste

36.7% and 33.5% of the respondents would like to receive information on waste discharge rules from collection agencies or from community leaders/imams/NGOs, respectively. On the other hand, only a few

respondents wanted to receive information through print media or public events. Therefore, when actually starting a waste collection service, it would be effective to inform residents through the waste collectors or people in the community.

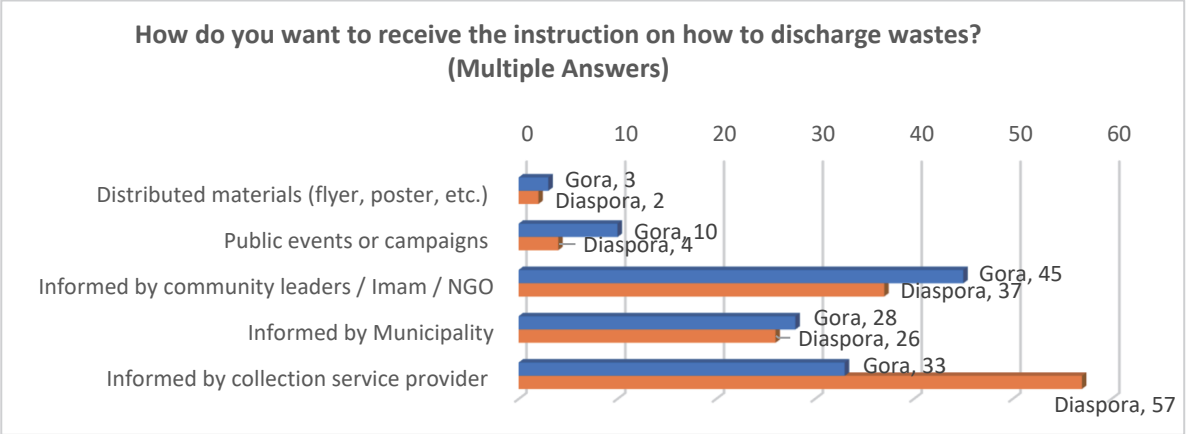


Figure 4-9: Methods of communication on waste discharge rules

(2) Cooperation in waste separation

Regarding participation in recycling activities in the community and schools, 84% of respondents indicated their willingness to cooperate. In addition, 80% of respondents indicated that they would be willing to cooperate if their municipality plans to introduce separate collection system. These results suggest the possibility of introducing separate waste collection in the future, after the waste collection service has been established to a certain extent.

(3) Interest in municipal activities

The activity in which citizens would be most interested in participating was a Cleanup Campaign (45.7%). Residents' meetings on waste discharge rules and environmental education at school were of interest to 30.7% and 23% of respondents, respectively. Thus, before starting a new collection service in Brod village, a clean-up campaign could be conducted with the cooperation of the citizens.

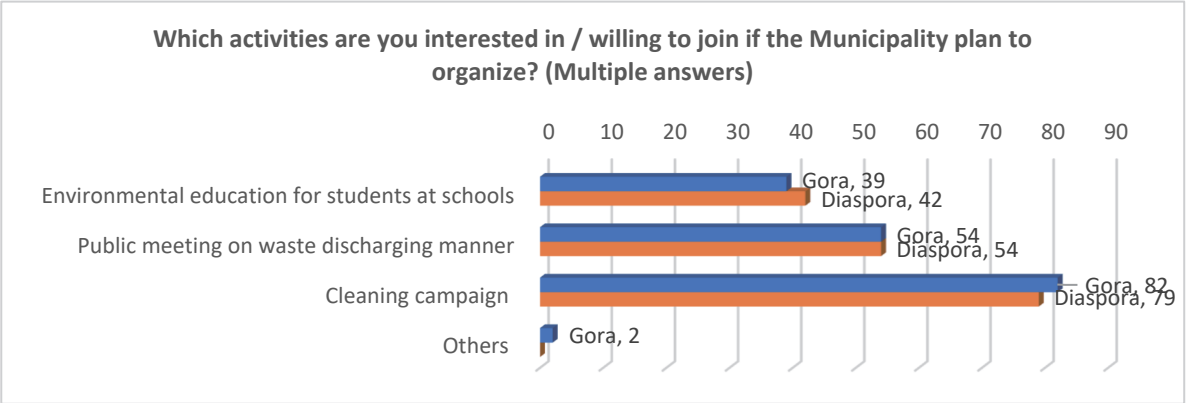


Figure 4-10: Activities of interest

c. Related photos

Screenshot of surveyed households in Brod village

Collecting from each house is difficult due to narrow roads (in winter)

Dumping of waste into rivers (in winter)

Interview 1

Interview 2

Figure 4-11: :Situation and survey in Brod village

4.2.4 Public opinion survey 2

4.2.4.1 Outline of the survey

The second POS was conducted to determine changes in the awareness and behavior of the Brod villagers three months after the start of the PP2 for Improvement of Waste Collection System, which has been implemented since April 2023. A summary of the survey is as follows.

Table 4-62: Summary of POS 2

Survey name	POS2 for PP2: Improvement of the waste collection system
Objectives	To identify changes in the awareness and behavior of the Brod villagers
Target site	Brod village in Dragash
Sample quantity	245 households
Survey period	July 17 - August 15, 2023
Survey method	Face-to-face interview with a digital questionnaire
Number of questions	27
Survey items	- General information for respondents - Waste disposal methods - Waste collection service - Pilot Project

4.2.4.2 Result of POS

A summary of the survey results is described below. For more information, see ANNEX 3: Public Opinion Survey 2.

a. Information on respondents

a.1 Distribution of respondents (Residential structure)

The total number of households in Brod village is 589. Of these, 245 households were extracted and divided into resident and non-resident populations, as in the previous POS. Residents accounted for 54.7% of the total and non-residents, known as Diaspora, accounted for 45.3%.

a.2 Distribution of respondents (Ethnicity)

Bosnian comprised 44.1% of all respondents, while the remaining 55.9% were Gorani. Among the resident population, the Gorani accounted for 50.8%, and in the Diaspora, the Gorani accounted for 62.2%.

Table 4-63: Ethnicity

Ethnicity						
	Permanent residents	%	Diaspora	%	Total	%
Gorani	68	50.8%	69	62.2%	137	55.9%
Bosnian	66	49.2%	42	37.8%	108	44.1%
Total households	134	100.00%	111	100.00%	245	100.00%

b. Main finding and comparison with POS1

b.1 Questions related to waste disposal

(1) Method of waste discharge

The results of POS2 are the opposite of those of POS1, as the situation has changed dramatically since the last POS when there was no waste collection service in Brod village. 98.8% of POS1 respondents stated that they disposed of their waste on roads, canals, and open spaces, while 99.6% of POS2 residents stated that they use the new waste collection service.

Table 4-64: Waste disposal methods

POS1 & 2-Q1. How do you dispose of your waste? (Multiple Answers)				
	POS1		POS2	
	Total	%	Total	%
I use the new waste collection service	0	0.00%	244	99.6%
I dump them on the streets, or in the canal or open land	242	98.8%	1	0.4%
I do not know	1	0.4%	0	0.00%
Others	2	0.8%	0	0.00%
Total	245	100.00%	245	100.00%

(2) Amount of waste generated

In POS1, 84.9% of respondents indicated that they generate one bucket of waste per week, while in POS2 this percentage decreased to 46.5%, indicating a significant decrease in the number of respondents generating this amount of waste. On the other hand, the percentage of respondents who reported generating two to three buckets of waste per week, the same as the actual frequency of waste collection, increased from 13.5% in POS1 to 47.8% in POS2.

This is most likely due to the availability of waste collection services, which has affected the way residents manage their waste. Residents are now willing to generate more waste because they know that their waste will be collected and disposed of efficiently due to the convenience of regular collection services.

Table 4-65: Amount of waste generated

POS1-Q11 & POS2-Q8. How much waste do you usually discharge/produce?				
	POS1		POS2	
	Total	%	Total	%
One bucket (approx. 10 L) per week	208	84.9%	114	46.5%
Two - Three buckets per week	33	13.5%	117	47.8%
More than four buckets per week	3	1.2%	7	2.9%
I do not know	1	0.4%	2	0.8%
Others	0	0.00%	5	2.0%
Total	245	100.00%	245	100.00%

b.2 Questions related to waste collection service

(1) Collection frequency

For the regular non-summer season, 56.8% of POS1 respondents preferred a twice-weekly collection frequency, while 41.2% preferred a once-weekly collection frequency. In POS2, on the other hand, 91.9% desired a collection frequency of three times per week.

For the summer season, when most Diaspora return home, 80% of those in POS1 wanted to be collected twice a week, while 42.1% of those in POS2 wanted to be collected three times a week, 15.5% wanted to be collected four times a week, and the rest wanted to be collected daily (except Sunday). This reflects a significant increase in the desire for more frequent collections during the summer season and may indicate a change in residents' needs and expectations; according to the NGO, in fact, during the summer season, at the most, there were five to six collections per week. To improve services, the Dragash municipality and NGO should educate residents about discharge patterns, costs, and environmental factors to enable wiser choices and cost savings.

Table 4-66: Frequency of waste collection requested during normal season

POS1-8 & POS2-11. How often do you want your waste to be collected usually (other than summer season)?				
	POS1		POS2	
	Total	%	Total	%
Once a week	101	41.2%		
Twice a week	139	56.8%		
Three times/week			225	91.9%
Four times/week			15	6.1%
Five times/week			3	1.2%
Every day other than Sunday			2	0.8%
In every two weeks	1	0.4%		
Others	1	0.4%		
No response	3	1.2%		
Total	245	100.00%	245	100.00%

Table 4-67: Frequency of waste collection requested during summer season

POS1-Q 9 & POS2-12. How often do you want your waste to be collected in summer season?				
	POS1		POS2	
	Total	%	Total	%
Once a week	45	18.4%		
Twice/week (same as a usual collection)	196	80%	37	15.1%
Three times/week			103	42.1%
Four times/week			38	15.5%
Five times/week			26	10.6%
Every day other than Sunday			41	16.7%
Others	1	0.4%		
No response	3	1.2%		
Total	245	100.00%	245	100.00%

(2) Willingness to pay and amount

In POS1, 97.6% of respondents indicated a willingness to pay for collection services, and 65.7% indicated that they would pay between 3 and 5 euros/household/month. The fixed fee derived from the POS1 results by NGO Zaeno za Brod, set at €5/month for residents and €20/year for Diaspora, serves as a guideline for residents in determining the amount they are willing to pay. About half of the residents (46.1%) are Diaspora and choose the annual payment system, while the other half (47.4%) follow the monthly payment system. This fixed fee system is sufficient to cover the costs of waste collection services in Brod Village, and residents can choose the amount they pay according to their residential status.

Table 4-68: Amount of willingness to pay

POS1-Q7. How much can you afford to pay per month to receive the collection service? **POS2-Q13. How much do you pay for the service?**					
POS1			**POS2**		
	Total	%		Total	%
up to 3	67	27.4%			
3 to 5	161	65.7%	5 €/month	116	47.4%
5 to 8	10	4.1%	7 €/month	15	6.1%
more than 8	3	1.2%	20 €/year	113	46.1%
No response	4	1.6%	seasonal		
Seasonal				1	0.4%
Total	245	100.00%		245	100.00%

b.3 Questions related to the pilot project

(1) Methods of communication on waste

Comparing the results of POS1 and POS2, there was a noticeable change in the preferred and used methods of communicating information in Brod village.

The most significant decrease was in the preference for receiving information from community leaders/imams, which decreased from 33.5% in POS1 to 2.5% in POS2. The preference for receiving information from the Ekoregjioni/Municipality also decreased from 22% in POS1 to 0.3% in POS2. Conversely, public meetings increased significantly from 5.7% in POS1 to 34.9% in POS2; in both POS1 and POS2, the most preferred and used method was information from the NGO Zeno Za Brod, which increased from 36.8% in POS1 to 55.5% in POS2. This result reflects a major change in the method of information dissemination, with information from public meetings and NGOs becoming more effective and preferred, while other traditional methods, such as community leaders and Ekoregjioni/Municipality, decreased in their use.

Table 4-69: Methods of communication on waste discharge rules

POS1-Q16. How do you want to receive the instruction on how to discharge wastes (Multiple Answers)? POS2-Q19. How did you receive such information/instruction? (Multiple Answers)?				
	POS1		POS2	
	Total	%	Total	%
Distributed materials (flyer, poster, etc.)	5	2.0%	5	1.4%
Public meeting	14	5.7%	128	34.9%
Through SMS			2	0.5%
Informed by community leaders/Imam	82	33.5%	9	2.5%
Informed by the Ecoregion/Municipality	54	22%	1	0.3%
Informed by the NGO, Zeno Za Brod / collection service provider	90	36.8%	203	55.5%
Others			18	4.9%
Total	245	100.00%	366	100.00%

(2) Commitment to waste reduction

A high level of commitment to waste reduction was observed in both POS1 and POS2, with 97.5% and 96.7% of respondents showing interest, respectively. In this regard, this confirms that Brod Village residents are ready to take waste reduction actions.

Table 4-70: Interest in waste reduction

POS1-Q14 & POS2-Q24. Do you/your family care about reducing the amount of waste?				
	POS1		POS2	
	Total	%	Total	%
Yes, we do	239	97.5%	237	96.7%
No, we do not	6	2.5%	8	3.3%
Total	245	100.00%	245	100.00%

(3) Activities to ensure the sustainability of PP

In POS 2, 34.7% of respondents indicated that "periodic public meetings on the progress of PP" are necessary. This is partly to raise awareness among residents and share concerns and difficulties in sustaining the effects of the PP. In addition, 32.7% indicated that they need financial support from the community for the maintenance of machinery and equipment; the fact that Diaspora donated at the start of the PP indicates that residents are aware of the need for ongoing financial support to keep the system functioning. In addition, residents still recognize the importance of environmental education and clean-up activities and believe that a multifaceted approach is critical to sustaining the benefits brought about by the PP.

Table 4-71: Activities of interest

POS1-Q21. Which activities are you interested in / willing to join if the Municipality plan to organize? (Multiple answers) POS2-Q26. What kind of efforts do you think are necessary to sustain the effects of the PP?				
	POS1		POS2	
	Total	%	Total	%
Environmental education for students at schools	81	23%	44	17.9%
Periodic public meetings on the progress of the PP			85	34.7%
Clean-up campaign	161	45.7%	34	13.9%
Financial support for maintenance of machines/equipment from the community			80	32.7%
Public meeting on waste discharging manner	108	30.7%		
Others	2	0.6%	2	0.8%
Total	352	100.00%	245	100.00%

In summary, these results show that since the introduction of the waste collection service, there have been significant changes in waste disposal methods, collection frequency, willingness to pay, and communication methods. Residents are very interested in waste reduction and are positive about various initiatives to ensure the sustainability of PP2, such as financial support, public meetings, and environmental education. These findings are useful to consider further activities and initiatives in Brod village.

a. Related photos

Accompanying field surveyors for interviews

Interview survey 1

Interview survey 2

Figure 4-12: Interview survey in Brod Village

4.3 Workshop for dissemination

4.3.1 First dissemination workshop

On the morning of February 13, 2023, MESPI hosted a workshop at MESPI (Pristina) to provide an overview of the Project.

MESPI issued invitations to 24 small and medium-sized municipalities, including the four target cities of this project. However, due to a misunderstanding among the municipalities that wished to participate, some of them went to Prizren because they did not know where the workshop would be held.

The workshop had no active discussion, although participating municipalities presented their comments. However, during the coffee break after the workshop, there was a lot of discussion. In Fushë Kosovë, a dormitory suburb near Pristina, the rapid increase in population has made waste collection in urban areas a significant issue, and there was a strong request for JICA experts to visit the Municipality to help solve the problems of urban area waste management.

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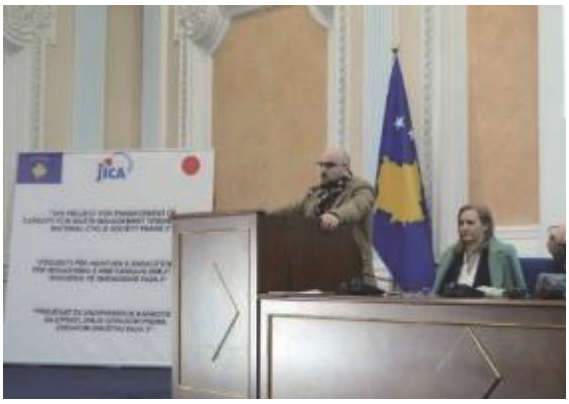
</td><td> 
</td></tr>
<tr><td>Opening Situation</td><td>Comments by municipal waste managers</td></tr>
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4.3.2 Second dissemination workshop

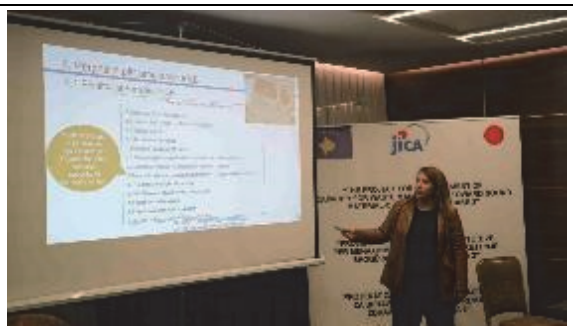
The second dissemination workshop was held on December 15, 2023. At the workshop, waste managers from the four target municipalities presented the procedures and lessons learned from each pilot project, followed by an exchange of opinions. The five municipalities that had expressed interest in the project and had been requested in advance by JICA experts to attend the workshop in person, plus three municipalities that had not received cooperation from other donors (Junik, Istog, and Klina), were invited to the workshop, resulting in attendance from two municipalities.

The Municipality of Kamenicë, interested in PP1, asked about the selection of pilot schools; the Municipality of Junik, interested in PP2 and PP6, asked about the reasons for choosing dumper in collection improvements.

The workshop was originally scheduled to be chaired by MESPI, but due to the absence of the project manager, the project's national staff moderated.

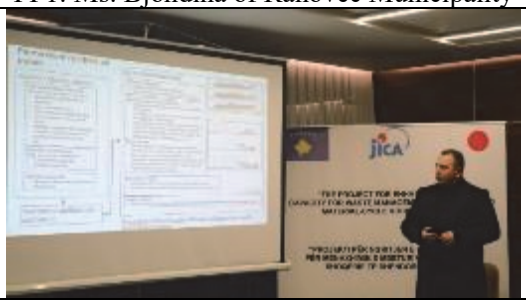
Table 4-72:Agenda for the 2nd Dissemination Workshop

Title	Presente	Time
Opening Remarks	Mr. Armend Agushi, (KEPA)(Not conducted due to late arrival.)	10:00 – 10:05
PP1	Mr. Bjondina Ramaj	10:05 – 10:25
PP2	Mr. Redzep Ibraimi	10:25 – 10:35
PP3	Mr. Bashkim Emini	10:35 – 10:45
PP4	Mr. Naser Morina	10:45 – 11:05
PP5	Mr. Fisnik Tahiri	11:05 – 11:15
PP6	Mr. Bjondina Ramaj	11:15 – 11:25
Break		11:25 – 11:30
Questions and Answers		11:30 – 11:50
Closing remarks	Mr. Hiroshi KATO, JICA Expert Team	11:50 – 12:00

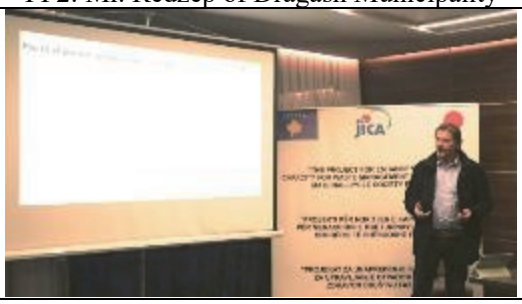


PP1: Ms. Bjondina of Rahovec Municipality

PP2: Mr. Redzep of Dragash Municipality



PP3: Mr. Bashkim of Dragash Municipality



PP4: Mr. Naser of Malisheva Municipality

PP5: Mr. Fisnik of Suhareka Municipality

PP6: Ms. Bjondina of Rahovec Municipality

Comments from Mr. Armend of KEPA

Group photo

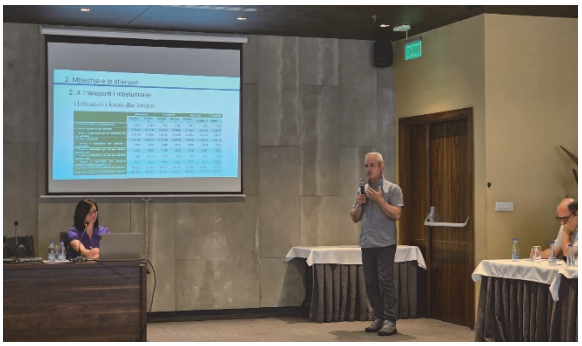
4.3.3 National Seminar

A National Seminar was held on June 17, 2024 to disseminate the model established in this project. At the seminar, as same as last workshop, waste management officers from the four target municipalities presented the procedures and lessons learned from each pilot project. Then we exchanged opinions with 10 invited municipalities (Lipjan, Fushe Kosove, Kamenice, Gracanica, Gllogoc, Skenderaj, Decan, Podujeve, Novoberde, Vushtri). Initially, the seminar was scheduled to be chaired by MESPI, but since MESPI did not dispatch the appropriate person, it was hastily changed to be chaired by a project local staff..

Title	Presente	Time
Opening Remarks	Mr. Hajime Fukuda (JICA Balkan Office)	10:00 – 10:05
Outline of the Project	Mr. Abdullah Pirce (MESPI)	10:05 – 10:15
PP1	Mr. Bjondina Ramaj	10:15 – 10:25
PP2	Mr. Redzep Ibraimi	10:25 – 10:35
PP3	Mr. Bashkim Emini	10:35 – 10:40
PP4	Mr. Naser Morina	10:40 – 10:50
PP5	Mr. Fisnik Tahiri	10:50 – 11:00
PP6	Mr. Bjondina Ramaj	11:00 – 11:10
Data Management	Mr. Armend Agushi (KEPA)	11:10 – 11:20
Dissemination Structure	Mr. Abdullah Pirce (MESPI)	11:20 – 11:30
Break		11:30 – 13:00
Issues Sharing		13:00 – 15:35
Closing remarks	Mr. Abdullah Pirce (MESPI)	15:35 – 15:40

PP1: Ms. Bjondina of Rahovec Municipality

PP2: Mr. Redzep of Dragash Municipality

	
PP3: Mr. Bashkim of Dragash Municipality	PP3: Mr. Naser of Malisheva Municipality
	
PP5: Mr. Fisnik of Suhareka Municipality	PP6: Ms. Bjondina of Rahovec Municipality
	
Data Management: Mr. Armend (KEPA)	Issues Sharing with invited municipalities
	
Opening Remarks by JICA Balkan Office	Group Picture

4.4 Training in Japan

4.4.1 Outline

To understand the actual situation of circular economy in Japan:

- Conduct a classroom lecture to learn about the state of waste management administration in Japan.

- Visit waste management facilities in Japanese local governments and exchange of opinions.

4.4.2 Itinerary

The participants departed from Kosovo/Pristina Airport on June 13, 2023, arrived at Narita Airport early in the morning of June 14, and were transferred by bus to JICA Tokyo Center. On June 15, a briefing on JICA's regulations was held in the morning, and in the afternoon, JET made a presentation on the training program to explain its purpose and contents to the participants and give meaning to their stay in Japan.

On June 16, the participants had a classroom lecture, and on June 19 and 20, they attended site visits and exchanged opinions with Japanese local government officials on waste management.

On June 21, an evaluation meeting was held. On June 22, the participants left JICA Tokyo Center early in the morning for Kosovo by air from Narita Airport, arriving at Kosovo/Pristina Airport on June 23. The following is a summary of the training schedule, and the places visited.

Table 4-73: Training schedule

Date		Time	Type	Contents
14-Jun-23	Wed.			Arrival in Japan
15-Jun-23	Thu.	9:30 to 12:00		Briefing and general orientation by JICA Training Officer
		14:00 to 16:00		Explanation of the purpose and content of the training by expert team
16-Jun-23	Fri.	10:00 to 12:00	Presentation	Presentations by the trainees: “My purpose for participating in this training program in Japan.”
		14:00 to 16:00	Lecture	Waste Management Administration in Japan / Mainly on the Formation of a Recycling-Oriented Society
17-Jun-23	Sat.			Day off
18-Jun-23	Sun.			Day off
19-Jun-23	Mon.	9:30 to 11:30	Field Trip	Itabashi Ward Recycling Plaza
		14:00 to 16:00	Field Trip	Fussa City and Fussa Recycle Plaza
20-Jun-23	Tue.	9:30 to 11:30	Field Trip	Saitama City Sakura Environment Center
		14:00 to 17:00	Field Trip	Hachioji City Tobuki Clean Center/Hachioji City
21-Jun-23	Wed.	9:00 to 12:00		Preparation for evaluation meeting
		14:00 to 16:00		Reporting and evaluation meeting (Presentation of the trainees on the achievement of their goals, evaluation meeting, issuance of certificates)
22-Jun-23	Thu.			Return to Kosovo by air

4.4.3 Participants

The participants were as follows.

Table 4-74: Participants’ name and title

Name	Title
Mr. Ibrahim Baraj	Senior Landfill Officer, Waste and Chemicals Division and Infrastructure Ministry of Environment and Spatial Planning and Infrastructure
Mr. Armend Agushi	Official for assessing the state of waste, chemicals and hazardous substances, Kosovo Environmental Protection Agency
Mr. Rifat Mazreku	Director of Public Services, Malisheva Municipality
Mr. Naser Morina	Municipal Waste Officer, Malisheva Municipality
Mr. Nuhija Tairovci	Director of Protection, Rescue and Public Services, Dragash Municipality
Mr. Bashkim Emini	Municipal Waste Officer, Dragash Municipality
Mr. Redzep Ibraimi	Municipal Public Service Officer, Dragash Municipality
Mr. Enver Shabani	Director of Public Services, Environment and Emergency, Suhareka Municipality
Mr. Fisnik Tahiri	Municipal Waste Officer, Suhareka Municipality
Mr. Perparim Krasniqi	Director of Public Services, Rahovec Municipality
Ms. Bjondina Ramaj-Fazliu	Senior Environmental Officer and Waste Coordinator, Rahovec Municipality

4.4.4 Training content

June 15, afternoon: Creation of a sense of purpose for the training, explanation of the content of the training
Confirmation of schedule and explanation of presentation procedures for the next day.


June 16, morning: Presentation by the trainees. The objectives of the participants in the training were presented.		
Presentations of trainees by affiliation in the following order: Malisheva, Suhareka, Rahovec, Dragash, MESPI, and KEPA.		
		
Malisheva	Suhareka	Rahovec
		
Dragash	MESPI	KEPA

June 16, afternoon: Lecture on Japan's waste management administration/recycling society

Lecture by Makoto Saito, a former official of the Japanese Ministry of the Environment and current special advisor to EXRI. The lecture's content was an explanation of Japan's waste management administration, including the formation of a recycling-oriented society and measures against illegal dumping.

Also, at the request of the MESPI trainees during the morning session, explanations were given on Japan's regional waste management and financial resources. A question-and-answer session followed, and the discussion was enthusiastic.

June 19, morning: Itabashi Recycle Plaza

Outline of the facility

This facility is located in Itabashi Ward in the north-western part of Tokyo with a population of approximately 547,000. It consists of a facility for sorting recyclable waste, a facility for selling recyclables, and an environmental education facility.

After an overview of the facility was given by ward office staff and the designated manager, a tour was conducted, and questions and answers were exchanged on-site. The trainees learned about one of the ways to give a second life to discarded items by seeing how unwanted items were collected and sold as recycled goods in a corner of the facility. The Municipality of Rahovec, which implements the PP for the recycling of bulky waste (furniture, etc.), showed high interest in this system.

June 19, afternoon: Fussa City Recycle Plaza
Outline of the facility This facility is located in Fussa City, west of Tokyo, with a population of approximately 56,000. It consists of a bulky waste treatment system, a resource recovery system, and a facility for raising awareness on recycling. The entire facility has a treatment capacity of 33 tons per day.
The population size of the Fussa city is close to the average of the four trainee cities. The trainees toured the facility with great interest, and active question-and-answer sessions were held during the tour. The trainees were deeply interested in this facility which, like Itabashi Recycle Plaza, is also engaged in the recycling and sale of unwanted items.



June 20, morning: Sakura Environmental Center, Saitama City
Outline of the facility The facility is located in Saitama City, a city with a population of approximately 1,264,000 people in Saitama Prefecture, north of Tokyo, and consists of the following: - Incineration facility for combustible waste (processing capacity: 380 tons/day) - Incombustible and bulky waste treatment facility (treatment capacity: 63 tons/day for resource sorting, 28 tons/day for crushing and sorting) - Environmental education facilities - Facility to experience preheating use (heated swimming pool, bathhouse, sauna, etc.)
It is a modern facility maintained and operated under a DBO scheme. It is in good condition with waste incineration, power generation, resource recovery, bulky waste treatment, and environmental awareness facilities. Before the tour, the designated manager gave a verbal explanation and showed a video introduction of the facility, followed by an enthusiastic question-and-answer session at the tour site.



June 20, afternoon: Tobuki Clean Center, Hachioji City

Outline of the facility

The Hachioji City Waste Processing Plant is located in the city of Hachioji, west of Tokyo, with a population of approximately 278,000, and is outlined as follows:

- Incineration facility for combustible waste (treatment capacity: 300 tons/day)
- Incombustible and bulky waste processing facility (treatment capacity: 28.4 tons/day of incombustible waste, 5.6 tons/day of bulky waste)
- Plastic Recycling Center (processing capacity: 40 tons/day of plastic, 12 tons/day of bulky waste)

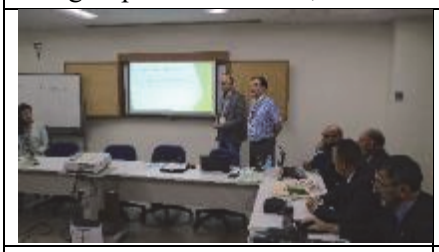
The trainees showed deep interest in Hachioji City's waste reduction efforts and illegal dumping measures. Although the facilities themselves were somewhat old, the tour of the sorting facility, bulky waste treatment facility, and incineration with power generation facility triggered repeated enthusiastic question-and-answer sessions.



June 21, afternoon: Evaluation meeting

At JICA Tokyo Center, Room 405, MESPI, Malisheva, Suhareka, Rahovec, and Dragash gave presentations on the results of the training, self-evaluation of the achievement of the training objectives, and the use of the training results after returning home.

All the participants reported that they wanted to use the training results in their respective city as much as they can. They explained that each city would like to develop environmental education, which is currently being implemented in PP, as a core element of the improvement program.


MESPI


Malisheva


Suhareka


Rahovec


Dragash


Meeting Status