

GUIDELINE *for* LOCAL SOLID WASTE MANAGEMENT PLANNING

“Developing Local Municipal Solid Waste Management
Planning Guidelines” project



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Planning Guidelines and
Training Needs Assessment for Implementing Such Guidelines” project

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Project website: https://ace.aua.am/waste/planning_guidelines/

List of acronyms

EPR	Extended producer responsibility
PRO	Producer responsibility organization
RA SC	RA Statistical Committee
EU	European Union
EEU	Eurasian Economic Union
ESM	Environmentally Sound Management
OBE	Organizations and business entities
SDG	Sustainable development goal
SW	Solid waste
MSW	Municipal solid waste
MSWM	Municipal solid waste management
AUA	American University of Armenia
CEPA	Comprehensive and Enhanced Partnership Agreement
NGO	Non-governmental organization
RA	Republic of Armenia
CNPO	Community non-profit organization
NRP	Nutrient recovery plant
C/D	Construction and demolition
ME	Ministry of the Environment
PPP	Public-private partnership
SNCO	State non-commercial organization
LSG	Local self-government
MTAI	Ministry of territorial administration and infrastructure
SCS	Separate collection site

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Introduction: why and how to develop a local solid waste management plan?

CHAPTER CONTENTS

- Description of the guide: goals and primary users
- MSW management policies: international commitments, national priorities and existing strategy
- National legislation and requirements for local SW management planning
- Institutional structure: role of national, territorial and local government authorities
- Local regulations (existing local regulations, plans, etc.)
- Significance and challenges of local SW management and the role of the present Guide
- Planning process and role of public participation
- Structure of local SW management plan
- Local SW management plan implementation report
- Data collection requirements and standards

Description of the guide: goals and primary users

The present guideline is foreseen for representatives of Armenian local self-governments, as well as territorial administration authorities that are committed to developing a local SW management plan. This guideline aims to facilitate the planning of sustainable local SW management by combining the national priorities and best international practices in the waste sector. The guideline has been developed to be relevant to any level of development of the SW management sector, as well as to ensure the transition from poor SW management to environmentally sound and sustainable SW management.

The chapter on **CURRENT SITUATION ANALYSIS** includes the description and assessment of the current situation in terms of planning of local SW management. The chapter describes how to develop the existing overview of the Planning Area, the waste handling profile, including current funding and budget, and how to assess the implementation of previously set goals.

The chapter on **PLANNING** refers to the actual development of the local SW management plan, which starts with forecasts and assumptions. The chapter describes how to establish new goals and targets, based on which the long-term strategy and short-term action plan will be built, as well as how to calculate the budget necessary for the implementation of planned actions. Separate attention is drawn to the monitoring of the implementation of the developed plan and related reporting.

The **Appendices** include relevant forms for defining SW management targets, legal acts pertaining to the sector, and other materials related to planning.

The guideline proposes a number of tables and templates that simplify planning, collection of necessary data, as well as identification of missing data and information. The guideline also includes some methodological recommendations on the collection of data and information.

SW management policies: international commitments, national priorities and existing strategy

Primary directions of the solid waste management strategy largely depend on the main policy priorities and needs of the country. Waste management is an integral part of multiple national priorities and strategies relating to the environment and areas such as tourism and energy, agriculture and industry.

The strategic development framework of Armenia – the Armenia Transformation Strategy 2050 – defines a number of mega-goals,¹ some of which are directly associated with waste management. The selected mega-goals are as follows:

¹ Details on this issue are available here: <https://www.gov.am/en/news/item/9554/>

1. PRODUCTIVE AND RESPONSIBLE FARMING
2. RENEWABLE AND ACCESSIBLE ENERGY
3. ATTRACTIVE FOR BUSINESS ARMENIA
4. CLEAN AND GREEN ARMENIA

In 2015, Armenia started a participatory process of nationalization and implementation of Sustainable Development Goals (SDGs),² some of which directly or indirectly involve waste governance aspects. The selected SDGs are:

- SDG 7: Ensure access to affordable, reliable, sustainable, and modern energy for all
- SDG 12: Ensure sustainable consumption and production patterns
- SDG 13: Take urgent action to combat climate change and its impacts

Waste governance aspects are reflected also in key national strategies and international agreements such as Republic of Armenia Government 2019-2023 Program [i], Republic of Armenia Solid Waste Management Development Strategy for 2017-2036 [ii], Cleaner Production Concept [iv], Comprehensive and Enhanced Partnership Agreement (CEPA) [vi] signed between RA and EU.

RA Constitution and ratified international waste-related treaties

The RA Constitution states the terms for use of natural resources defined in articles 10 and 12. Particularly:

Article 10. Guaranteeing Ownership

1. All forms of ownership shall be recognized and equally protected in the Republic of Armenia.
2. The subsoil and water resources shall fall under the exclusive ownership of the State.

Article 12. Preservation of the Environment and Sustainable Development

1. The State shall promote the preservation, improvement and restoration of the environment, the reasonable utilization of natural resources, guided by the principle of sustainable development and taking into account the responsibility before future generations.
2. Everyone shall be obliged to take care of the preservation of the environment.

Armenia is a party to 11 international treaties related to waste management. Table 1 includes the names and dates of ratifications of those treaties.

#	Treaty	Year of
1	Convention on Long-Range Transboundary Air Pollution	1997
2	UNECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in	1998

² Details on the implementation of SDGs are available in the following report: SDG Implementation Voluntary National Review (VNR) Armenia, https://sustainabledevelopment.un.org/content/documents/19586Armenia_VNR_2018.pdf

3	The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal	1999
4	Helsinki Convention on the Transboundary Effects of Industrial Accidents	1997
5	Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and	2004
6	Stockholm Convention on Persistent Organic Pollutants	2004
7	Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste	2013
8	Minamata Convention on Mercury	2017
9	Agreement on the cooperation of CIS member states with respect to the use of electronic and electrotechnical	2018
10	Decision of the Eurasian Economic Commission on defining the rates of import duties of the Eurasian Economic	2015
11	Agreement on Procedure of Movement of Private Goods by Individuals across the Customs Border of the	2010

*Table 1 – Armenia’s membership to international agreements related to waste management
Source: Data collected from various sources by the authors of the present report*

#	Treaty	Year of
1	Bilateral Agreement between Armenia and Georgia on Cooperation in the Sectors of Environment and Natural	1997
2	Memorandum of Understanding Between the Ministry Environment of the Republic of Armenia and Iran	2001
3	Agreement Between the Ministry of Environment of the Republic of Armenia and the Ministry of Environment of	2003
4	Agreement Between the Ministry of Environment of the Republic of Armenia and the Ministry of Environment of	2009
5	Agreement Between the Ministry of Environment of the Republic of Armenia and the Ministry of Environment of	2009
6	Memorandum of Understanding Between the Ministry Environment of the Republic of Armenia and the Ministry	2011

*Table 2 – Inter-state agreements related to the environment signed by Armenia
Source: Data collected from various sources*

RA Government program 2019-2023

The government program released in February 2019 outlines the main directions for the country’s environmental management, particularly focusing on environmentally sound management of chemicals and wastes (including mining waste). To ensure convenient and ecologically safe living conditions for citizens and to reduce the negative (hazardous) impacts of the municipal solid waste on the environment and public health, the program sets out the following:

- an institutional framework to establish waste management system compliant to international standards
- waste management cost-recovery through improved waste handling fee collection and better contracting and legal framework in the sector
- implementation of waste disposal and recycling programs in collaboration with international institutions

To ensure the implementation of the government program, RA Government has approved (Government Decision 650-L, adopted on 16.05.2019) the program of actions for 2019-2023. Table 9 reflects the summary of actions facilitating the primary directions of solid waste governance set in the program:

#	Action and outcome	Due date
95.1	Submission of a Draft Law on Chemical Materials to the Prime Minister's office	June 2020
95.4	Development of conceptual approaches to waste management (directed to prevention and recycling of industrial, agricultural, medical, and C/D waste streams).	August 2019
97.1	Introduction of an electronic system for permits and licenses issued by the Ministry of the Environment	November 2020
97.3	Modernization of the monitoring networks for the environmental components (air, water, soil, biodiversity) and the waste disposal sites	November 2022
97.5	Development of a shared environment information system that will include thematic libraries	September 2023
99.1	Reduction of plastic waste through the application of economic mechanisms, including a sharp reduction in the use of single-use plastic bags	June 2019
102.1	Effective implementation of ecological training in all educational levels	December 2020
102.2	Development of informal ecological education through public-awareness-raising mechanisms	2022-2023
226.2	Increase of the rates of waste handling service fee collection in communities	September 2020
226.3	Development of a waste management strategy (that will ensure collection, safe disposal, or recycling of solid waste in all communities).	August 2019

Table 3 - Summary of the actions supporting the main directions on solid waste governance set in the program (N-65A)

Strategy for the introduction of extended producer responsibility (EPR) systems

On April 12, 2018, the RA Government adopted a Protocol Decision on Approving the Strategy and 2018-2021 Action Plan for the Introduction of the Extended Producer (Importer) Responsibility Systems. At its core, the EPR has a governing strategy, according to which the producer or the importer, in the initial stage of production (import) of the given item, foresees measures preventing the environmental impacts (or neutralizing the negative impacts) arising in the final stage of that product's (good's) use and bears administrative and financial liability for the elimination of said negative impacts. The objectives of the EPR system are:

1. Prevention of waste generation
2. Reduction of quantities at source of generation
3. Recycling as secondary raw materials
4. Recycling as secondary energy resource
5. Burial in landfills (as the least preferable method for waste management)

The main long-term goal for the introduction of the EPR system is the promotion of production that meets environmental requirements, which will help to prevent environmental pollution and reduce the use of natural resources in all production cycles as well as reduce costs of waste recycling.

Comprehensive and Enhanced Partnership Agreement (CEPA)

The Comprehensive and Enhanced Partnership Agreement (CEPA) was signed between EU and RA of Armenia on 24 November 2017.³

³ The annex on the timeline has entered into force from the moment of signing the CEPA (24 Nov 2017) https://eur-lex.europa.eu/resource.html?uri=cellar:60b9829d-a1f1-11e7-a56f-01aa75ed71a1.0015.02/DOC_2&format=PDF

Below is a list of Armenia's commitments related to waste governance in the frameworks of CEPA. These are presented as targets to be met according to the set timeline:

- By 2020 to have established a system for disseminating environmental information to the public
- By 2021 to have prepared national strategy reducing the amount of biodegradable municipal waste going to landfill
- By 2021 to have established control and monitoring procedures in the operation phase of landfills and of closure and after-care procedures for landfills to be disaffected
- By 2021 to have established application and permit system and of waste acceptance procedures (at landfills)
- By 2022 to have prepared waste management plans in line with the five-step waste hierarchy and of waste prevention programs
- By 2023 to have established a register of waste collection and transport establishments and undertakings
- By 2024 to have established a full cost recovery mechanism in accordance with the polluter pays principle and extended producer responsibility principle
- By 2024 to have established conditioning plans for existing landfill sites
- By 2024 to have established a system ensuring the relevant waste is subject to treatment before landfilling
- By 2025 to have established obligations for operators to take the necessary prevention and remediation measures including liability for costs
- By 2025 to have established a strict liability for dangerous occupational activities.

Waste hierarchy

Waste Hierarchy sets a priority order for steps to minimize and manage waste and is usually presented as a diagram (see Figure 1). The inverted pyramid suggests that the most preferred policy step is to prevent the generation of waste. The next preferred step is to reduce and minimize waste generation through reuse, repair and other preparation for reuse. Material or nutrient recovery is the next preferred action, followed by the downstream steps of other recovery options such as producing energy or fuel from waste. If energy is recovered from processes such as incineration or pyrolysis and gasification, or from landfill, it also belongs at this level of the hierarchy. The final and least preferable option is the disposal of waste in case prevention, reuse or recovery was not possible. The disposal implies either depositing in properly engineered and managed landfills (after a proper pre-treatment if necessary) or incineration without energy recovery or other safe disposal.

The adoption of the Waste Hierarchy and integrating it to various national policies and strategies should become a priority direction for the Armenian Government on the national and regional and local self-government level.

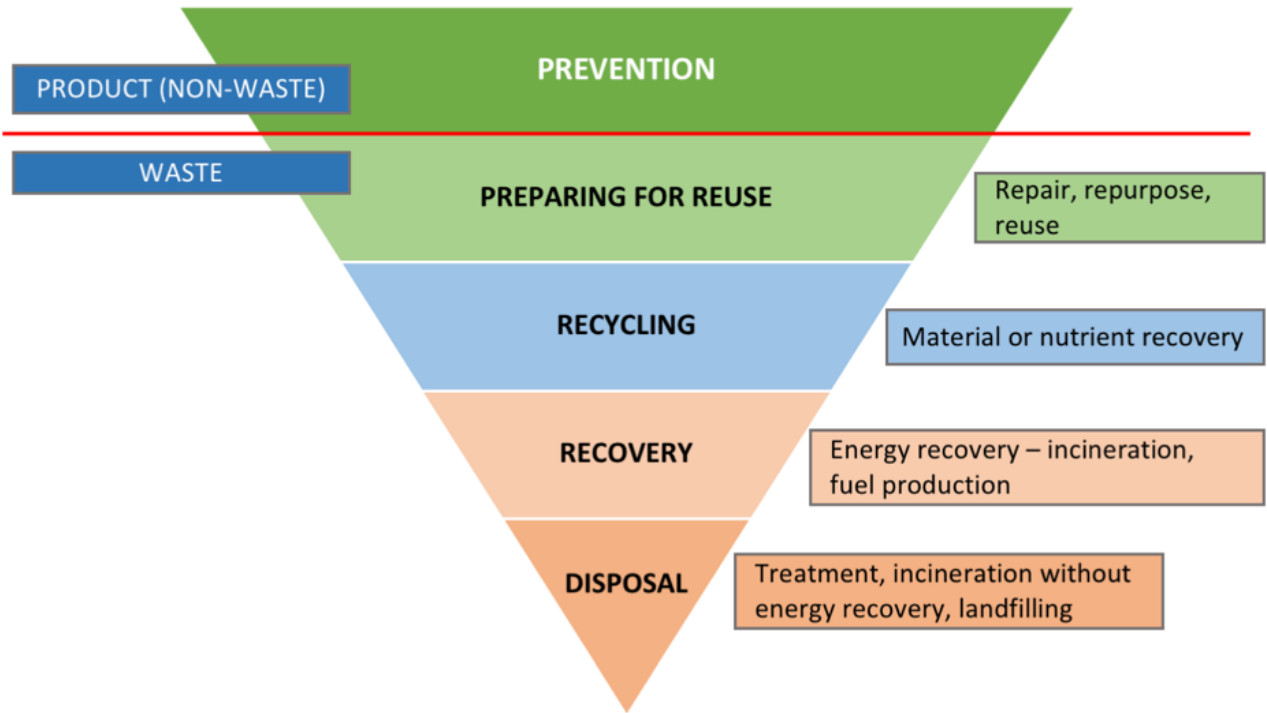


Figure 1 – Five-step waste hierarchy

National legislation and requirements for local SW management plan

National legislation

The Armenian waste legislation involves more than fifty laws⁴ and sub-legislative acts related to waste management. Armenia has signed more than ten international treaties and agreements directly related to waste. Figure 2 below illustrates overall structure of the RA legal framework. The present section addresses overall scope of the domestic legislation involving only the key legislation.

Simplifying and modernizing the waste legislation has been a priority objective for the EU since 2008. Harmonization of different national legislation and its implementation on the European level has been identified as a priority objective, not least because harmonization includes the potential to simplify legislation.

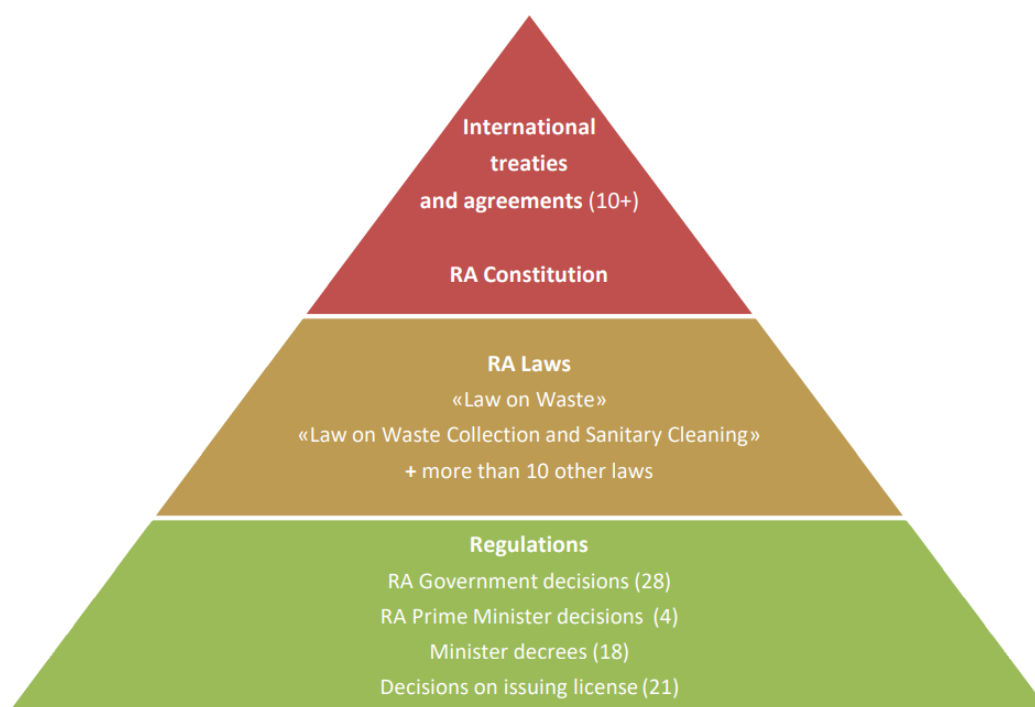


Figure 2 – The structure of the RA legal framework

Source: Data collected from various sources by the authors of this report

National MSW Management Strategy for the years 2021-2023

On 2021 April 1, the RA Government adopted the National MSW Management Strategy for the years 2021-2023 and the road-map to implement the strategy.⁵ The Strategy defines the below set of priorities and directions to develop the MSW management on national level. Some of them (6-11) directly derive from the Waste Hierarchy approach.

- 1) Improvement of waste handling and sanitary cleaning services
- 2) Adoption of efficient schemes for waste handling and sanitary cleaning
- 3) Improvement of the relations between service providers and customers
- 4) Adoption of waste handling service evaluation mechanisms

⁴ The up-to-date list of legislative acts related to waste management in Armenia is available at the Waste Resource Library of the AUA Acopian Center for the Environment (<https://wrl-ace.aua.am/legislation>)

⁵ The decision, strategy and the road-map are available in Armenian at: <https://www.arlis.am/DocumentView.aspx?DocID=151384>

- 5) Engagement of qualified organizations to maintain sound waste collection, transportation, and disposal operations as well as landfill management
- 6) *Adoption of circular economy instruments*
- 7) *Reducing waste generation at source*
- 8) *Adoption of mechanisms for sorted collection of wastes subject to reuse, recycling, and recovery*
- 9) *Implementation of waste reuse, recycling, and energy recover, as well as reduction of landfilled waste*
- 10) *Reduction of landfilling of biodegradable waste*
- 11) *Adoption of incentives for sorted collection, reuse, recycling, and recovery of waste.*

Requirements for local SW management planning

Chapter 9 of the Constitution of the Republic of Armenia (amended on December 6, 2015) describes local self-governance. Section 2 of Article 179 of the Constitution states that, “Local self-governance shall be exercised in communities. Local self-governance shall be the right and capacity of local self-government bodies to decide, under their own responsibility, on public issues of community importance — in the interests of residents of the community and in compliance with the Constitution and laws.”

In principle, LSG authorities have the right to do anything legal that is based on the interests of the residents of their community.

According to the RA Law on Local Self-governance, the head of the LSG authority, “Shall organize waste disposal and sanitary cleaning, as well as implement other functions foreseen by the Law on Waste Disposal and Sanitary Cleaning.”

No separate imperative legal provisions on the development of local SW management plans exist in the Armenian legislation, and this is why communities mostly do not have any strategic plans for waste disposal or management. Despite few successful attempts at the development of such plans and their adoption by local councils in the frameworks of international donor programs, these have remained largely on paper and are barely used in practice.

Even with current legal regulations, communities have the right and capacity to have local strategic SW management plans. However, they are guided by the principle that no imperative provisions exist for having such plans and thus, they do not take independent steps to implement short-term, mid-term, and long-term strategic planning.

Institutional structure: the role of national, regional, and local self-government authorities

Armenian legislation regulating the sector of waste governance and waste management needs to be thoroughly revised. In particular, legal boundaries of all entities should be clarified based on EU best practices as well as the requirements stemming from Armenia’s commitments undertaken by international treaties.

Because the concepts of the sector are defined in two separate laws (Law on Waste, and Law on Waste Disposal and Sanitary Cleaning), regulating similar relations creates legal confusion, which makes the adequate enforcement and protection of legal norms difficult.

The RA Law on Waste attempts to define the frameworks of competences of national and local self-government authorities with respect to waste governance, waste management and sanitary cleaning services through defining concrete activities for waste handling (i.e., waste collection, storage, use, treatment, recovery, disposal, neutralization, placement, burial, transportation, etc.), as well as the legal competences of national and local self-government authorities for waste handling. Nevertheless, there is a need to clarify and substantiate the role of national, regional, and local self-government authorities.

Article 11 of the RA Law on Waste defines the legal competences of local self-government authorities in the sector of waste handling within the administrative boundaries of the community.

Local regulations

Currently one of the challenging issues⁶ is the fact that there is no clear definition for waste handling services, and there is no justified or differentiated local fee (set price) relevant to the type and quality of the service delivered.

There is no differentiation in the communities between the service scope for waste management and sanitary cleaning; therefore it is difficult to identify community budget expenses per those services, especially in the cases when waste management services are provided by community non-profit organizations.

The Law on Local Self-Governance requires the community council to approve the scheme for sanitary cleaning of the community. However, legally it would be more appropriate to establish that the community council shall approve the strategic waste management plan, which would also include schemes for sanitary cleaning.

Significance of local SW management planning and the role of the present Guideline

The implementation of the goals of the national strategy for SW governance largely depends on the waste management implemented at the local level. For example, meeting national targets for the reduction of waste disposed in landfills or increasing volume of waste recovery depends on the planning and implementation of sorted collection at the local level, which is often times a very hard task. The efficiency of sorted collection is directly linked to the attitude and behavior of the local population. Therefore, awareness-raising projects and other activities conducted by the LSG authorities in the community should be integral to planning. Another challenge for local SW management is the collection of accurate data that plays a critical role in the planning process. Thus, LSG authorities must include the development of data collection mechanisms in their planning.

In general, planning is required to both protect the environment and meet the needs of the population. Community authorities and service providers are often overwhelmed with their daily activities and overlook the mid-term and long-term development of the sector. It is worth noting that waste management planning included in five-year development plans usually addresses only waste collection and landfilling while leaving out such components of sustainable waste management as sorted collection and recovery, management of hazardous wastes, etc.

The present guideline aims to provide step-by-step instructions to LSG authorities in the process of comprehensive planning for local SW management and to offer solutions to the aforementioned and other issues.

Public participation in the planning process

In order to appropriately plan local SW management, it is necessary to ensure public participation, as well as the participation of other stakeholders, i.e., recycling entities, civil society organizations, etc. It is vital that the community population is not just informed of the decisions made by LSG authorities, but also participates in the decision-making related to local SW management where the role of the population is actually essential. For instance, if the community is planning to switch to sorted waste collection, then it will be critical to ensure public participation in the development and selection of sorting methods as the end-user of the service. Only with the engagement of different stakeholders will it be possible to get a comprehensive overview of informal rules, traditions, relations, preferences, intentions, and tendencies prevalent in the community. The roles of different actors and their input in the local SW management system should be made clear for everyone.

EU Directive 2001/42/EC makes public engagement a mandatory requirement for conducting a strategic environmental assessment, which also includes waste management. This is in compliance with the Aarhus Convention, one of the requirements of which is ensuring the gradual participation of the community residents and NGO sector in the development of community legal acts directed at environmental protection.

⁶ Analysis of legal regulations is presented as of March 2021

The actual development of the local SW management plan should be preceded by a series of community forum format discussions with multi-stakeholder groups. The discussions aim to identify the primary issues for local SW management, to define priorities, conduct a SWOT analysis, develop and formulate the vision and goals of SW management within the Planning Area. The outcomes of the community forums should be summed up in section 1.2 Primary issues, priorities, vision. Relevant manuals should be used in order to have more effective community forums with the multi-stakeholder groups. The links to these materials are available in the useful resources section under APPENDIX C.

During the process of local SW management planning, it will also be important to include residents and other stakeholders in the budgeting procedure. This can be done through participator budgeting (APPENDIX C – Useful resources).

Figure 3 presents the structure for organizing public participation in the local SW management planning process.

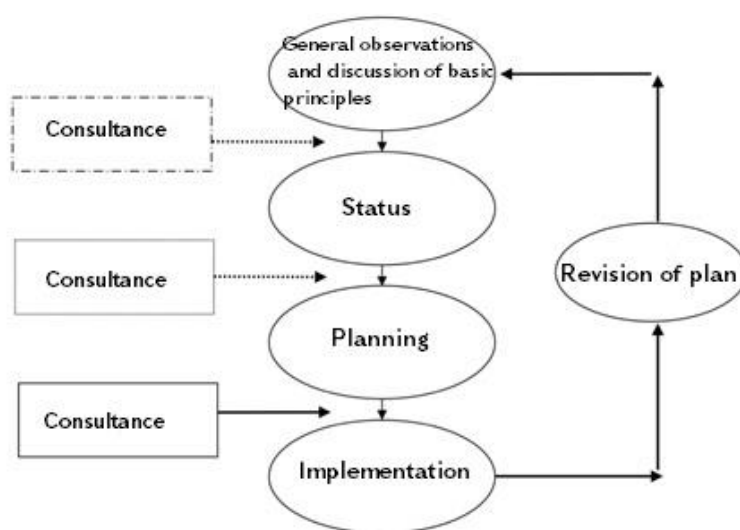


Figure 3 – Public participation in the local SW management planning process
 Source: Preparing a Waste Management Plan: A methodological guidance note, 2012. Available at <https://ec.europa.eu/environment/waste/plans/index.htm>

Data collection requirements and standards

Effective strategic planning is almost impossible without the availability of reliable data. Therefore, data collection is an integral part of planning. The more accurate and reliable entry data is, the more concise and complete will be the description and analysis of the situation, which are the two main components of the local SW management plan. The collection of reliable and accurate data is not at all an easy task, especially when these are collected for the first time. It is vital to create effective, long-term and sustainable mechanisms for data collection on both the national and community levels.

Perhaps the most important data for the purposes of planning is the quantity of waste generated in the community in form of the amount of waste per community (province or country) or per capita generated in a given timeframe. For instance, in 2019, Yerevan generated 330 thousand tons of municipal waste. The MSW generation per capita rate for that year was 325kg/year or 0.9kg/day. In order to calculate these figures accurately, sustainable mechanisms are required, i.e., weighbridges available to waste management companies at the municipal landfills as well as sorting or recovery facilities (if available). Otherwise, this figure will only be the result of approximation, which will not be applicable, for instance, for recording waste generation changes in the community over a 3-year period.

The quantity of waste disposed in municipal landfills is an important indicator, for which collection of accurate and reliable data is possible only if there are checkpoints, weighbridges, and basic control available. It is true that the number of garbage trucks transporting waste collected in the community to landfills could be an alternative source. However, it is obvious that in this case the data won't be accurate since the weight will be calculated based on the truck capacity using the common density coefficient (i.e., 0.5t/m³), which almost always is a different number. This last case also does not consider uncontrolled disposal of waste in the same landfill. In its annual reports, the RA Statistical Committee publishes the annual quantity (thousand tons) of SW disposed in landfills from Yerevan and the provinces. These figures are again calculated based on the waste volumes (in cubic meters) data provided by the communities.⁷

	2015	2016	2017	2018	2019
ք.Երևան Yerevan city	295.1	310.1	310.1	310.2	323.6
Արագածոտն Aragatsotn	22.0	4.9	5.6	3.6	4.0
Արարատ Ararat	16.3	18.2	13.3	15.3	14.2
Արմավիր Armavir	37.7	40.5	60.3	15.4	16.9
Գեղարքունիք Gegharkunik	14.6	15.9	16.5	17.7	18.6
Լոռի Lori	22.7	19.8	10.5	16.9	8.6
Կոտայք Kotayk	26.7	30.3	31.4	33.8	33.8
Շիրակ Shirak	17.3	17.9	15.7	21.6	19.4
Սյունիք Syunik	11.4	11.9	11.8	14.1	12.9
Վայոց ձոր Vayots Dzor	6.6	6.8	8.2	9.4	9.8
Տավուշ Tavush	22.4	23.4	10.5	11.9	11.0
Ընդամենը ՀՀ Total RA	492.8	499.7	493.9	469.9	472.8

Figure 4 - Household waste transported into municipal landfills by RA marzes and Yerevan city, 2015-2019 (thousand tons)
Source: RA Statistical Committee, Environment and natural resources in RA for 2019: <https://www.armstat.am/am/?nid=81&id=2301>

Another key data is the composition of waste generated in the community, the accurate assessment of which can only be possible through regular sampling and analysis conducted with clear methodology.

Since the year 2000, eight projects implemented in Armenia involved solid waste quantity and composition analysis either as part of the project or as its main purpose. All of the analyses have been carried out using different methodologies, in different parts of the country, and in different seasons, so that the results are not compatible with each other.⁸

The latest analysis has been carried out in summer 2019 by the AUA Acopian Center for the Environment in partnership with the Government of Armenia in the frames of the Waste Quantity and Composition Study (WQCS) project. The MSW analysis tests has been executed in 6 locations (the cities of Yerevan, Ararat, Kapan, Hrazdan, Vanadzor, and Gyumri) to acquire a representative sample for the entire country. To execute the tests a methodology used in EU (specifically Sweden) has been used and adapted to the Armenian context.⁹

⁷ RA Statistical Committee, Environment and natural resources in RA for 2019: <https://www.armstat.am/am/?nid=81&id=2301>

⁸ AUA Acopian Center for the Environment (2020). WASTE GOVERNANCE IN ARMENIA. American University of Armenia and LIFE Foundation. Project website: <https://ace.aua.am/waste/governance/>

⁹ Republic of Armenia Waste Quantity and Composition Study, Yerevan. AUA Acopian Center for the Environment, AUA Manoogian-Simone Research Fund, «LL Bolagen», (2020). Project website: <https://ace.aua.am/waste/composition/>

As previously noted, the present guideline offers a number of tables and templates that make it easier to collect data and information required for planning, and to identify missing data and information. It is critical to identify the missing or unavailable data and include the improvement of collection mechanisms in the planning—for instance, by making it mandatory for contractors to report data on waste. The guideline also includes some methodological recommendations for the collection of data.

Structure of local SW management plan

Review of international best practices shows that SW management plans usually have similar structures that can differ at the level of separate sections. The structure of the local SW management plan offered in this guideline has been developed based on the methodological guidance note published by the European Commission.¹⁰ Just like planning on the national level, local planning includes two primary sections: current situation analysis and future planning. Thus, the proposed local SW management plan includes the relevant two chapters and their sections. The contents of the guideline, starting from Chapter 1, are compliant to the noted structure presented below. The complete detailed structure of the local SW management plan is presented in [Appendix A](#).

1. CURRENT SITUATION ANALYSIS
 - 1.1. Introduction (Plan Summary)
 - 1.2. Description of Planning Area
 - 1.3. Primary issues, priorities, vision
 - 1.4. Waste quantity and composition
 - 1.5. Waste handling
 - 1.6. Current level of awareness
 - 1.7. Funding and budget
 - 1.8. Monitoring and assessment of previously set objectives
2. PLANNING
 - 2.1. Forecasts
 - 2.2. Assumptions
 - 2.3. Setting objectives and targets
 - 2.4. Action plan
 - 2.5. Long-term development
 - 2.6. Budget and funding required for the implementation of planned action
 - 2.7. Waste management budgeting

Reporting and monitoring of the local SW management plan

Any strategic planning and the implementation of the action plan stemming from the plan should be assessed based on the outcomes. This can be done through assessing whether targets and goals set in the plan were met in accordance with established indicators. Following this, an analysis of obstacles and issues is done which can result in a need for certain changes in the plan aiming to secure a more effective implementation of targets.

The implementation of the local SW management plan developed by LSG authorities includes monitoring done by the competent authority that should be conducted through reports. The present guideline presents a template for that report along with instructions on filling and submitting the report ([APPENDIX D – Reporting template for implementation of local SW management plan](#)).

The following two chapters provide step-by-step guidance for the process of development of the local solid waste management plan.

¹⁰ Preparing a Waste Management Plan: A methodological guidance note, 2012. <https://ec.europa.eu/environment/waste/plans/index.htm>

The two chapters below (CURRENT SITUATION ANALYSIS and PLANNING) present step-by-step guidance for the process of development of the local solid waste management plan.

To make the planning process easier, and also to make the future plan more legible and accessible, the guideline recommends presenting part of the contents in form of tables.

There are notes on whether or not each table in different subsections of the guideline is optional or required to be completed.

Obviously, some of the data required for planning may be temporarily missing or unavailable, especially in relation to waste handling methods. In that case, the following should be taken into account:

- Even in cases of tables that are *required* to be completed, there will be fields where required data is temporarily missing or unavailable. These fields should just be left blank.
- The missing or unavailable data and information should be identified and include improvement of their collection mechanisms in the planning.

It is important to bear in mind that all number or indicators reflected in the tables are brought as examples to illustrate how to complete them.


1 CURRENT SITUATION ANALYSIS



1 CURRENT SITUATION ANALYSIS

CHAPTER CONTENTS

- 1.1 Introduction (Plan Summary)
- 1.2 Description of Planning Area
- 1.3 Primary issues, priorities, vision
- 1.4 Waste quantity and composition
- 1.5 Waste handling
- 1.6 Current level of awareness
- 1.7 Funding and budget
- 1.8 Monitoring and assessment of previously set objectives

 The table with the following general data is presented prior to the introduction of the proposed plan. [The table **must be** completed]

	<i>i.e.,</i>
Plan title	<i>SOLID MUNICIPAL WASTE MANAGEMENT PLAN FOR VARDASHEN COMMUNITY 2022-2027</i>
Community(ies) included in the planning	Vardashen
Planning time period	2022-2027
Dates of expected revisions for the proposed plan	September 2024 September 2026
Name, surname, position of plan developers	
E-mails of plan developers	
URL for downloading the digital version of the plan	

1.1 Introduction (Plan Summary)

The introduction section of the Local SW Management Plan is recommended to be written when all sections of the plan have already been finalized. The introduction of the Local SW Management Plan should present certain information on the developed plan while answering the following questions:

- How does the plan contribute to the implementation of national objectives and targets?
- Are there any links with other strategic documents?
- How does the plan align with the Waste Hierarchy (see subsection on Waste Hierarchy)?
- Which communities are included in the Planning Area?
- Is inter-municipal cooperation planned?
- Are there planned waste reduction programs?
- Are there planned awareness programs?

1.2 Primary issues, priorities, vision

As mentioned in the Introduction, the actual development of the Local SW Management Plan should be preceded by a number of discussions with multi-stakeholder groups in the format of community forums. The goal of the discussions is to identify main issues in relation to SW local management, define priorities, conduct a SWOT analysis, develop and formulate the SW management vision and objectives within the Planning Area. Outcomes of the community forums with multi-stakeholder groups should be summarized in the present section. Relevant manuals should be used in order to have more effective community forums with the multi-stakeholder groups. The links to these materials are available in the Useful resources section under [APPENDIX C](#).


This section describes the outcomes of analyses and works completed with the engagement of multi-stakeholder groups:

- Identification of primary issues
- Definition of priorities
- SWOT analysis
- Development of vision and objectives

1.3 Description of Planning Area

Considering the fact that local SW management plans can be developed by one community, as well as a group of communities, in the context of the present Guideline, the term *Planning Area* means a common administrative territory of one or more communities. The approach for group planning is particularly expedient in the case of several non-consolidated communities. Thus, the Planning Area may include one or more communities.

1.3.1 Description of Planning Area per area types

 Details must be completed in the following table. **[Required]**

	Total	Urban	Rural	Industrial	Green, forest
Area (ha)	420	280	140	34.1	65.2
Percentage of total area (%)	100%	66%	34%	15%	13.5%

Table 1 – Description of Planning Area per area types (current situation)

1.3.2 Geographic boundaries

Mark geographic boundaries of the Planning Area on the map and insert the image in this subsection. A hardcopy of a map with boundaries manually marked on it can be used, or a marked digital map can be uploaded. In either case the image must clearly indicate the geographic boundaries of the Planning Area. (The map is **required**)

1.3.3 Demographic information

➔ Relevant data **must** be completed in the following table:

Registered population (person)	Actual population (person)	Number of households	Individual residential houses	Number of apartment buildings	Number of apartments

Table 2 – Demographic information (current situation)

1.3.4 Types and number of main waste generation sources

➔ Relevant data **must** be completed in the following table:

Type of waste generation source ¹¹	Quantity	Observations
Residential buildings		
Apartment buildings		
Individual residential houses		
Non-residential buildings		
Buildings housing commercial (including markets), catering, and population services		
Hotels and guesthouse services as well as other public buildings		
Production, industrial, and office buildings		
Educational, cultural, health, sports, scientific & research and other such buildings		
Buildings housing more than one economic activity		

Table 3 – Type and quantity of main waste generation sources (current situation)

1.4 Waste quantity and composition

The most important indicators for SW management planning are the quantity and composition of waste generated in the Planning Area. This is critical especially for the development of programs and interventions aimed at the reduction of generated waste when there is a need to determine the target sources or streams where waste reduction measures will be most effective. The same refers to the treatment and recovery.

Some indicators of generated waste quantity are as follows:

- Total volume of waste generated in one year (tons per year, t/year)
- Weight of annually generated waste per capita (per capita, kg/year)
- Weight of daily generated waste per capita (per capita, kg/day)

The composition of generated waste is commonly calculated according to the share (percentage) of each fraction within the total volume. The inclusion of any fraction (i.e., Styrofoam or green glass) depends on the assessment methodology. For instance, it is possible to assess the total share of plastic waste or the share (percentage) of each type of plastic waste – soft plastic packaging, Styrofoam, dense plastic, other plastic.

An appropriate assessment of waste composition requires a clear methodology and a frequency of studies. The composition of waste changes depending on the seasons. Therefore, to have an accurate general picture of the waste composition, during the preliminary assessments it is vital to conduct tests in different seasons of the year. Considering the amount of resources they require, these tests can later be repeated once every few years. It is preferable to repeat the assessment when there are significant economic or demographic changes, i.e., a change in the number of bakeries, restaurants, supermarkets, a massive emigration or immigration, etc.

¹¹ The list has been developed in accordance with the Republic of Armenia Law on Disposal and Sanitary Cleaning (ՀՕ-110-Ն)

When conducting a waste composition assessment, it is necessary to use the *Guideline for Quantification of MSW*, which includes a detailed methodology and the required conditions and steps for carrying out the studies. In case local analysis is impossible or infeasible, the planner may need to resort to data from other similar areas, adjusted to some local conditions.¹²

1.4.1 Waste quantity per streams and their handling methods

A waste stream is a conventional concept which describes the flow of wastes grouped together based on a certain feature starting from generation all the way up to reuse, treatment, recovery, disposal or destruction/burial. At the core of this grouping is the primary constituent material of waste, waste product or other properties, such as hazard level or generation source.

To make planning more efficient and easier, it is necessary to identify primary and secondary streams (see Table 5), which usually comprise the mixed unsorted solid municipal wastes (see Table 6).

Primary waste streams are as follows:

- **Municipal solid waste** (household waste, including recyclable waste disposed in garbage bins)
- **Bulky waste** (waste the size of 2 m² or more which does not fit in garbage bins)
- **Packaging waste** (generated in commercial zones)
- **Waste Electric and Electronic Equipment (WEEE)** (any device that uses electricity or batteries)
- **Hazardous waste (excluded WEEE)** (i.e., paints, chemicals, lubricants, combustibles, medicine, medical waste, etc.¹³)
- **Tires** (tires of trucks and cars, bicycles)
- **Construction and demolition waste (C/D)** (generated from both major and minor construction activities)
- **End-of-life vehicles** (passenger cars and trucks)
- **Municipal garden waste** (trimmings, leaves, and similar wastes).

The secondary waste streams are noted in [Table 6](#) and described in detail in the *Guidelines for Waste Inventory*. These correspond to the methodology that has been used multiple times in Sweden and is in line with EU standards.

Waste handling methods include the following:


Code	Waste handling method	Description
I	Sorted collection	Collection of individual types of waste organized by the operator according to a certain scheme at the source of generation or transportation of waste by the generator to the sorting center
II	Collection (mixed and sorted)	Sorted or mixed collection of waste by the operator or transportation of waste by the generator to the sorting center
III	Reuse	Multiple use of the product for the original purpose (i.e., washing and reuse of glass bottles)
IV	Repurpose	Use of waste for other purposes, i.e., use of C/D waste as a landfill cover
V	Recovery (recycling)	Production of secondary raw materials through recycling of metal, glass, paper and plastic waste
VI	Nutrient recovery (composting)	Production of fertilizer or treatment of waste through aerobic digestion (composting)
VII	Energy recovery in form of fuel	Extraction of biogas, briquettes, pellets, biodiesel and other fuels from waste through recycling

¹² The Guidelines for Waste Inventory are included in the Republic of Armenia Waste Quantity and Composition Study: <https://ace.aua.am/files/2020/08/WQCS-Report-Eng.pdf>

¹³ See APPENDIX B : For a complete list, see the "List of hazardous wastes according to the level of hazard:" <https://www.arlis.am/DocumentView.aspx?DocID=35639>

VIII	Energy recovery (incineration)	Production of thermal energy or electricity through high-temperature burning of waste
IX	Treatment (treatment, liquidation of hazardous wastes)	Treatment, liquidation or elimination of hazardous waste through high-temperature incineration
X	Disposal in uncontrolled dumps	Disposal of waste in dumps or uncontrolled landfills non-compliant to sanitary norms
XI	Disposal in landfills (including in sanitary ones)	Disposal of waste in all types of landfills

Table 4 – Handling methods and description of wastes used in planning

 Table 5 is **required**.

Filling out Table 6 is **not** mandatory as it requires data collection mechanisms or separate studies.

Commentary on examples presented in Table 5

Assuming that the actual population of the Planning Area is 7200 people:

- The quantity of annually-generated solid municipal waste (MSW) is 1,411 thousand tons. MSW collection services are provided only to 82% of the population.
- A portion of the packaging waste generated in a commercial zone (i.e., shops, supermarkets, bakeries, guesthouses), 141 tons per year, which is 15% of the overall MSW, is collected separately and sent for recycling.
- Unsorted MSW is stored in uncontrolled dumps after collection because no sanitary landfills exist in the Planning Area.
- 187 tons of bulky waste is generated annually within the Planning Area. 5% of this waste is repurposed.
- 9,510 tons of C/D waste is generated within the Planning Area. This waste is repurposed for covering the solid wastes disposed in the landfill.
- It is assumed that data on other streams and methods of their handling is not available.

Primary waste stream	Generation per capita (kg/year per capita)	Generation per total annual quantity (thousand t/year)	Waste handling by quantity											Observations	
			I	II	III	IV	V	VI	VII	VII	IX	X	XI		
			Sorted collection (% of the total generated quantity)	Collection (mixed and sorted) (% of the total population)	Reuse (% of the total generated quantity)	Repurpose (% of the total generated quantity)	Recovery (recycling) (% of the total generated quantity)	Nutrient recovery (composting) (% of the total generated quantity)	Energy recovery in form of fuel (biogas, briquette, biodiesel, RDF) (% of the total generated quantity)	Energy recovery (incineration) (% of the total generated quantity)	Treatment (treatment, liquidation of hazardous waste) (% of the total generated quantity)	Disposal in uncontrolled dumps (% of the total generated quantity)	Disposal in landfills (including in sanitary ones) (% of the total generated quantity)		
Municipal solid waste	175	1.26	15%	82%									100%	100%	
Bulky waste	26	0.187	100%			5%							95%	95%	
Packaging waste	19,6	0.141	90%	10%			90%						10%	10%	
WEEE (Waste Electric and Electronic Equipment)															
Hazardous waste (excluded WEEE)				100%									100%	100%	
Tires															
C/D waste	1,320	9.51				100%							100%	100%	
End-of-life vehicles															

Table 5 – Waste quantity according to primary streams and their handling (current situation)

Indicators noted in the Table are merely examples.

Category	Secondary waste stream	Generation per capita (kg/year per capita)	Generation per total annual quantity (thousand t/year)	Waste handling by quantity														
				I	II	III	IV	V	VI	VII	VIII	IX	X	XI				
				Sorted collection (% of the total generated quantity)	Collection (mixed and sorted) (% of the total population)	Reuse (% of the total generated quantity)	Repurpose (% of the total generated quantity)	Recovery (recycling) (% of the total generated quantity)	Nutrient recovery (composting) (% of the total generated quantity)	Energy recovery in form of fuel (biogas, briquette, biodiesel, RDF) (% of the total)	Energy recovery (incineration) (% of the total generated quantity)	Treatment (treatment, liquidation of hazardous waste) (% of the total generated quantity)	Disposal in uncontrolled dumps (% of the total generated quantity)	Disposal in landfills (including in sanitary ones) (% of the total generated quantity)				
A. Organic (food and vegetation residue)	A1. Kitchen waste																	
	A2. Garden waste																	
	A3. Other biodegradable waste																	
B. Paper and cardboard	B1. Newspapers,																	
	B2. Corrugated cardboard																	
	B3. Paper packaging																	
	B4. Other																	
C. Plastics	C1. Soft plastic packaging																	
	C2. Styrofoam																	
	C3. Dense plastic																	
	C4. Other																	
D. Glass	D1. Glass packaging																	
	D2. Other glass																	
E. Metals	E1. Metal packaging																	
	E2. Other																	
F. Other	F1. Other inorganic																	
G. Hazardous	G1. Hazardous waste																	
H. Mixed	H1. Mixed WEEE																	
I. Other	I1. Wood																	
	I2. Textiles																	
	I3. Diapers, sanitary napkins, etc.																	
	I4. Other																	

Table 6 – Waste quantity according to secondary streams and stages of their handling (current situation)

1.4.2 Waste composition by fractions

The table below must be completed as follows:

- according to option C and B, if a waste composition study has been carried out in the Planning Area using the *methodology of the Guideline for Waste Inventory*
- according to option C and B, if a waste composition study has been carried out in the Planning Area using a different methodology or if the assessment has been done through the approximation method (i.e., approximation to the results of an assessment carried out in a similar community/area).

Completing the table is preferable but **not required**.

Option A (very general)	%	Option B (according to primary fractions)	%	Option C (according to secondary fractions)	%		
Organic		A. Organic		A1. Kitchen waste			
				A2. Garden waste			
				A3. Other biodegradable waste			
Paper and cardboard		B. Paper and cardboard		B1. Newspapers, etc.			
				B2. Corrugated cardboard			
				B3. Paper packaging			
				B4. Other paper			
Plastic		C. Plastic		C1. Soft plastic packaging			
				C2. Styrofoam			
				C3. Dense (hard) plastic packaging			
				C4. Other plastics			
Glass		D. Glass		D1. Glass packaging			
				D2. Other glass			
Metals		E. Metals		E1. Metal packaging			
				E2. Other metals			
Other		F. Other inorganic		F1. Other inorganic			
		G. Hazardous waste (excluded WEEE)		G1. Hazardous waste			
		H. Mixed WEEE		H1. Mixed WEEE			
		I. Other				I1. Wood	
						I2. Textiles	
						I3. Diapers, sanitary napkins, etc.	
						I4. Other	

Table 7 – Waste composition according to fractions (current situation)


1.5 Waste handling

For SW management purposes, it is important to describe and assess in detail the separate stages of waste handling, capacities, infrastructure, and resources required for this, as well as the roles, legal framework and level of liability of actors involved in said stages.

1.5.1 SW collection

Collection of solid wastes in communities is usually done through the following methods: bins placed in yards, waste chutes (in high-rise buildings) and households or companies, following a certain schedule, or through garbage trucks

that arrive randomly or by order. Another option is transportation by the entity generating the waste. This is when the generator transports the waste to a sorting, treatment, recovery facility or a landfill. It is important to estimate which percentage of the population within the Planning Area uses waste collection services and, if so, then through which method? (There might be communities where only 95% of the population uses waste collection services, of which 15% is sorted collection and 80% is mixed.)


 Only data on municipal solid waste **must** be completed in the table below:

Collection method	Total coverage per population (%)	Sorted collection (%)	Unsorted collection (%)	Observations
Curbside bins				
Waste chutes				
Collected from houses or companies based on a timetable				
Collected from houses or companies after a phone call (mobile trucks)				
Collected from houses or companies by order				
Self-transportation by producer ¹⁴				

Table 8 – Collection of solid waste in communities by method and population coverage (current situation)

¹⁴ According to the RA Law on Disposal and Sanitary Cleaning, entities generating construction and bulky waste are exempt from waste management fees in cases when they transport and dispose of the waste at their own expense and based on the permission foreseen by section 4 of article 8 of said legislation or in accordance with the contract concluded with entities foreseen by section 3 of the same article.

1.5.2 Current waste management operators


 Data **must** be completed in the table below:

#	Name of operator	Waste type(s) required to be collected by the operator	Planning Area coverage (%)	Communities covered by the operator	Population of service area	Type and capacity (cubic meters) of garbage trucks of operator (open, closed, compactor, other)	Number of garbage trucks of operator	Whether capacity is sufficient for current needs (sufficient, insufficient)	General assessment of operator performance (1-very poor, 2-poor, 3-fair, 4-good, 5-excellent)	Observations
1										
2										
...										
6										

Table 9 – Current waste management operators

1.5.3 Transportation schemes

This subsection complements the previous one. The transportation of wastes within the Planning Area should be discussed here: i.e., location of treatment facilities and dumpsites (landfills), whether there is transportation organized by waste generators themselves, and if so, how and where the waste is transported to. Descriptions should be provided about the above-mentioned *primary* streams of waste.

 In addition to the description in text, the following table **must** be completed as well.


Primary waste stream	Distance to landfill (km)	Distance to transfer facility (km)	Distance to sorting center (km)	Distance to facility for other handling (km)	Observations on self-transportation by producer
Municipal solid waste					
Bulky waste					
Packaging waste					
WEEE (Electric and electronic devices)					
Hazardous waste (excluded WEEE)					
Tires					
C/D waste					
End-of-life vehicles					

Table 10 – Transportation of waste according to waste streams and handling (current situation)

1.5.4 Reuse and preparation for reuse

To ensure sustainable waste management, it is essential to have an accurate assessment of capacities for reuse of products and wastes in the Planning Area. This includes, for instance, producers of juices or dairy products which return glass containers to the plant for further reuse. Another important aspect in the reuse value chain is the presence of

workshops that prepare products for reuse, i.e., repair shops for apparel, shoes, furniture, domestic electric appliances and electronic devices, construction components, auto spare parts, and other products.

 Data **must** be completed in the following two tables:

#	Production type	Returned and reused component type (glass container, plastic container, and other packaging)	Name of producer	Return or collection mechanism (received only at the factory, received at shops, there are special points of collection)	Level of convenience for consumer to return product (1 - inconvenient 2 - convenient 3 - easy)	Observations
1						
2						

Table 11 – Producers applying reuse (current situation)

#	Product type	Number of repair shops	Observations
1	Refrigerator		
2	Washing machine		
3	Other domestic appliance		
4	Clothing and shoes		
5	Furniture		
6	Car parts		
7	Construction components (i.e., door, window)		

Table 12 – Repair capacities (current situation)

1.5.5 Informal sector (sorting at the source or landfills)

This subsection describes sorting and recovery activities done by the informal sector in both landfills and communities (rural and urban) at curbside bins, surroundings of shops, yards and other sources.

 Data **must** be completed in the following table:

#	Type of sorted waste	Received at special collection points (yes/no)	Collected from bins (yes/no)	Collected from surroundings of shops (yes/no)	Collected at landfills (yes/no)	Collected from other places (specify)
1	Glass waste					
2	Metal waste					
3	Plastic waste					
4	Paper waste					
5	Car batteries					
6	Other waste (specify type)					

Table 13 – Sorting and recovery of waste done by the informal sector (current situation)

1.5.6 Waste treatment plants

 Data **must** be completed in the following table:

Primary waste stream	Availability (available in Planning Area, available in another community, not available)	Capacity (thousand t/year)	Distance from Planning Area (km)	Observations
Sorting center				
Glass recycling facility				
Paper recycling plant				
Plastic recycling plant				
Metal recycling plant				
Textile recycling plant				
Other recycling plant				
Civic amenity site				
Organic waste composting plant				
Biogas production plant using organic waste				
Other recovery facility (specify)				
Incineration plant				
Other treatment/liquidation plant				
Transfer facility				
Landfill(s)				
<i>Add rows as needed</i>				

Table 14 – Waste handling plants (current situation)

1.5.7 Landfills and dumpsites

The present subsection describes all active and inactive landfills within the Planning Area, including landfills that are outside the Planning Area but are operated by communities within the Planning Area.

 Data **must** be completed in the following table:


#	Landfill identification code* (to be provided from the MTAI mapping database)	Community(ies) operating the landfill(s)	Approximate area of landfill (ha)	Landfill status Date launched	Planned end year for operations	Types of disposed waste	Sorting and recovery done by informal sector	Right of ownership	Register number issued to object (RA Ministry of the Environment) EIA available	Legal basis for establishment, number and date of legal basis	Name of operator, type of organization	EIA	Waste disposal fee (AMD/ton)	Annual environmental fee (AMD)
1	ARAR_015	Abovyan /Arar./	0.27	Burnt, regularly covered with soil		Municipal	Available	Municipality		Decision of local council	Municipality	Not done		
2	ARAR_019													

Table 15 – Landfills and dumpsites (current situation)

The identification code of the given landfill will be issued by the Ministry of Territorial Administration and Infrastructure and data exchange on the landfill will then be conducted using this code. All other data must be filled by entities developing the SW management plan.

1.5.8 Landfill access roads

The road leading to the entrance of the landfill is important infrastructure that impacts the maintenance expenses of garbage trucks greatly. The poor conditions of these access roads make it economically useless to acquire new trucks due to the risks of them breaking down quickly. Poor access roads often become a risk for the waste collection staff as well, especially in cases where the road passes by the edge of a gorge or other dangerous areas.

 Access roads of all operated landfills **must** be described in this subsection based on the characteristics presented in the table below:

#	Landfill code (from MTAI mapping database)	Length of access road (km)	Condition of access road (1- very poor 2 - poor 3 - fair 4 - good 5 – excellent)	Date of last repair of access road	Owner of access road
1	ARAR_015				

Table 16 – Landfill access roads (current situation)

1.5.9 Distribution of roles and responsibilities among various stakeholders

To ensure effective planning, it is important to assess the engagement and role of different stakeholders and actors in different stages of local SW management. In terms of organization, main actors of local SW management are the private and public sectors (ministry of territorial administration and infrastructure, local self-government authorities). The distribution of roles and responsibilities obviously largely depends on the waste type or stream.

According to the “polluter pays” principle, the private sector should be responsible for the collection and further treatment of waste generated in the sector. However, entities responsible for the collection of waste generated by citizens can be different. For instance, local self-government authorities are usually responsible for the collection of mixed unsorted municipal waste. They can also delegate this task to private companies or implement it through a public-private partnership (PPP). In the case of bulky waste and other types of waste, individuals can organize the transportation of waste (*self-transportation by producer*) to sorting centers. Another example is when extended producer responsibility (EPR) schemes are used for batteries, WEEE waste, tires, different types of packaging waste (i.e., glass and plastic containers) and other products. These schemes ease the burden of municipalities for waste management since both the collection and future use of the waste is organized by the producer or importer of the product that caused the waste.

The local SW management plan should include a distribution of roles and responsibilities for all waste streams in question.

Assessment should first of all be carried out based on the degree of engagement.

For instance, if the collection of sorted solid municipal waste is done in the Planning Area equally by the municipality and the private sector, then in the relevant column, it should be marked 50% for both stakeholders. If awareness-raising programs are implemented only by NGOs, then in the row for *Civil society organizations* it should be marked 100%. If no awareness-raising, waste treatment, recycling, and recovery activities are carried out in the Planning Area, then relevant columns should be left blank.


Data **must** be completed in the table below *only* for MSW management. Other types of solid wastes should also be evaluated in such columns as needed, i.e., C/D waste, tires, batteries, and other hazardous waste.

Commentary on examples presented in Table 17

- Awareness-raising programs and sorting is done in the Planning Area only by civil society organizations.
- Mixed and unsorted collection and transportation is done by the municipality.
- There is no factory sorting, recycling, energy recovery, or treatment conducted.
- Disposal at the landfill is done by the private entity operating the landfill.

#	Current stakeholder	Awareness-raising (%)	Sorted collection (%)	Mixed, unsorted collection (%)	Transportation (%)	Factory sorting (%)	Reuse (%)	Repurpose (%)	Recycling (%)	Energy recovery (%)	Treatment (%)	Disposal in landfill (%)
1	Local self-government (LSG)			100%	100%							
2	Private sector (PS)											100%
3	EPR											
4	Population											
5	Civil society organization (CSO)	100%	100%									

Table 17 – Degree of engagement of stakeholders in SW local management (current situation)

 The table below **must** be completed with data of current stakeholders involved in the corresponding management phase for the given waste stream. Current stakeholders comprise the above-mentioned 4 groups: LSG, PS, population, CSO. If there is an active extended producer responsibility (EPR) scheme in the Planning Area, then mark EPR in the relevant box. For instance, if there is an active EPR scheme in the Planning Area for certain types of packaging waste, while the rest of packaging waste is collected by LSG, then mark both LSG and EPR in the relevant box.

Commentary on examples presented in Table 18

- Civil society organizations carry out awareness-raising programs within the Planning Area touching on topics such as MSW, hazardous waste, batteries and tires, and harmful impacts of poor use of WEEE.
- Sorted collection, transportation and disposal of bulky waste in landfills is done by the private sector.
- The municipality carries out unsorted, mixed collection and transportation of MSW.
- There is no factory sorting, recycling, or energy recovery conducted.
- Disposal of waste in landfills is done by the private entity operating the landfill.
- There are extended producer responsibility schemes in place within the Planning Area specifically for packaging waste (i.e., glass bottles).

#	Waste stream or type (describe in detail, add rows as needed)	Awareness-raising	Sorted collection	Mixed, unsorted collection	Transportation	Factory sorting	Reuse	Repurpose	Recycling	Energy recovery	Treatment	Disposal in landfills
1	Municipal solid waste	CSO		LSG	LSG							PS
2	Bulky waste		PS		PS							PS
3	Packaging waste		EPR		EPR				EPR			
4	WEEE (electric and electronic devices)	CSO										
5	Hazardous waste (WEEE excluded)	CSO										
6	Tires	CSO										
7	Batteries	CSO										
8	C/D waste		PS		PS							PS
9	End-of-life vehicles											
10	Other waste streams (specify)											

Table 18 – Engagement of stakeholders in local management of SW according to waste streams (current situation)

1.5.10 Assessment of staff capacity

To ensure effective planning, it is essential to assess the capacity of relevant staff of territorial administration and local self-government authorities against the level of required skills. This analysis should become the basis for the development of measures and objectives aimed to improve capabilities of staff described under subsection 2.3.3

Data should be completed in the following table: **[not required]**

#	Skill or sector	Number of employees possessing the relevant skill	Current level of skill (1-very low, 2-low, 3-average, 4-high, 5-excellent)	Observations
1	Data collection			
2	Computer-based mapping			
3	Procurement management			
4	Contract management			
5	Operational skills			
6	Waste management knowledge			
7	Armenian legislation knowledge			
8	Financial analysis capacity			

Table 19 – Assessment of staff capabilities (current situation)

1.5.11 Waste handling map

To find effective logistic solutions, SW management planning requires specific information on the location of waste handling facilities, including their visual representation on a map. This subsection should include a map that will

visualize the waste sorting, treatment and recovery plants, transfer facilities, landfills mentioned in previous subsections, as well as other commonly used uncontrolled dumpsites, their access roads, and other important facilities related to waste handling within the Planning Area (if available).

If the capacity for computer mapping exists, it is preferable that the map is created using computer software (i.e., ArcGIS, QGIS or other) and is inserted in the subsection as an image.

If no computer mapping capacity is available, relevant markings should be made on the hardcopy map of the Planning Area, and its copy should be inserted in this subsection.

1.6 Current level of awareness

As discussed previously, sustainable waste management largely depends on the level of public awareness as well as the awareness of territorial administration and local self-government staff. While the awareness of administration authorities is particularly important in terms of defining priorities on the local level, adopting decisions and planning, public awareness impacts the implementation of those decisions and planning. Therefore, the assessment of the level of awareness plays an essential role during planning, especially in relation to the development of measures aimed at the improvement of awareness.

1.6.1 Awareness assessment method

The awareness assessment can be done using different methodologies. However, to ensure consistency of data, it is important to always use the same methodology and indicators during the regularly-conducted awareness assessment within the Planning Area.

A questionnaire-based simple method of awareness assessment is proposed. Two questionnaires are presented below for assessing the level of public awareness as well as the level of awareness of territorial administration and local self-government staff involved in SW local management.


Results of the survey must be completed in the table below:

#	Skill or sector	Current level of awareness (1-very low, 2- low, 3-average, 4-high, 5-excellent)	Observations
1	Environmental impacts of poor waste management		
2	Social impacts of poor waste management		
3	Economic impacts of poor waste management		
4	Impacts of moving waste to landfills		
5	Knowledge of waste hierarchy		
6	Benefits of waste reduction		
7	Benefits of sorted waste collection		
8	Benefits of waste reduction and reuse		
9	Benefits of waste reuse		
10	Benefits of waste recovery		
11	Knowledge of any sorting at source program		

Table 20 – Current level of public awareness

1.6.2 Method for assessing residents' satisfaction with waste management services

The assessment of residents' satisfaction with waste management services is done through a survey. The results of the survey should be completed in the table below. The survey topics must correspond to the Category column of the table.

 Assessment of residents' satisfaction and completing this table is **required**.

#	Category	Current level of satisfaction (1-very unsatisfied, 2- unsatisfied, 3-average, 4-satisfied, 5-very satisfied)	Observations
1	Availability of bins in community (distance from house or building)		
2	Condition of bins in community (clean, damaged)		
3	Sorted collection of waste (if available, how convenient is it?)		
4	Frequency of sorted waste collection (if available, how well are relevant norms maintained?)		
5	Frequency of unsorted waste collection (if available, how well are relevant norms maintained?)		
6	Collection of bulky waste (if a convenient mechanism exists)		
7	Clean streets		
8	Waste management fee (if the service provided is worth it)		
9	Overall level of provided services		

Table 21 – Level of residents’ satisfaction with the waste management services

1.7 Funding and budget

This section must include the financial and economic description of solid waste management implemented within the Planning Area.

1.7.1 Overview of income and expenditures

Year	Population			Organizations and business entities (OBE)		
	Actual population	Contracts	Actually collected (%)	Number of OBEs	Contracts	Actually collected (%)
2022						
2023						

Table 22 – Contracts with residents and OBEs within the Planning Area

	Income from sold recyclables (thousand AMD)	Other Incomes (thousand AMD)	Expenses (thousand AMD)	Balance (thousand AMD)	Observations
2020 Quarter I					
2020 Quarter II					
2020 Quarter III					
2020 Quarter IV					


Table 23 – Waste management income and expenditures within the Planning Area during the last year (in quarters)

Quarter	Population			OBEs		
	Planned	Actual	%	Planned	Actual	%
2020 Quarter I						
2020 Quarter II						
2020 Quarter III						
2020 Quarter IV						

Table 24 – Fees charged to the population and OBEs and collection rates during the last year (in quarters)

1.7.2 Details of current waste management fee per primary streams


In addition to the waste management for municipal solid waste, in some communities, local self-government authorities organize waste management services for other waste streams, i.e., bulky waste, packaging waste, etc. Therefore, it is important to differentiate their management expenses as well.

 Available data **must** be completed in the table below:

	I	II	III	IV	V	VI
Primary waste stream	Waste management fee defined by community council (AMD/person AMD/ton)	Total costs for waste management fee collection	Total annual fees collected	Subsidies	Total costs for waste collection	
Municipal solid waste						
Bulky waste						
Packaging waste						
WEEE (waste electric and electronic equipment)						
Batteries						
Hazardous waste (WEEE and batteries excluded)						
Tires						
C/D waste						
End-of-life vehicles						

Table 25 – Details of current waste management fee per primary streams

1.7.3 Cost of available waste handling options

 Available data **must** be completed in the table below:

#	Waste stream or type (describe in detail, add new rows as needed)	Sorted collection (AMD/ton)	Mixed, unsorted collection (AMD/ton)	Transportation (AMD/ton)	Factory sorting (AMD/)	Sale as raw materials for recovery (AMD/ton)	Composting (AMD/ton)	Incineration (AMD/ton)	Other treatment (treatment, liquidation of hazardous waste) (AMD/ton)	Disposal in landfill (AMD/ton)
1	Municipal solid waste									
2	Bulky waste									
3	Packaging waste									
4	WEEE (electric and electronic devices)									
5	Hazardous waste (WEEE excluded)									
6	Tires									
7	Batteries									
8	C/D waste									
9	End-of-life vehicles									
10	Other waste streams (specify)									

Table 26 – Cost of accessible waste handling options per streams (current situation)

1.7.4 Existing cost price for SW management per primary streams

The calculation of the current cost price for SW management is a **required** component of planning. This cost is calculated for each SW stream, for which organized handling is available. An MS Excel tool has been developed for the calculation of the proposed SW management cost price.¹⁵

It should be noted that if an environmental tax is charged for the placement of a given solid waste stream in the landfill, then this also needs to be included in the calculation for the price cost of SW management. The amount of environmental taxes established in Armenia for the disposal of waste of different hazard levels in the landfill is presented below.

Industrial and/or consumption waste per hazard class	Rate per ton (AMD)
Wastes of first class of hazard	62,400
Wastes of second class of hazard	31,200
Wastes of third class of hazard	6,240
Wastes of fourth class of hazard (except for operators performing activities of garbage disposal and sanitary cleaning of unsorted consumption wastes generated by natural persons)	1,950
Non-hazardous wastes	780

Image 5 - Rates of environmental (landfill) tax for placing and storing mining, industrial and/or consumption wastes in specially designated areas after 2021.

Source: RA Tax code

¹⁵ The tool for the calculation of the proposed price cost of SW management is available for download here: https://ace.aua.am/hy/waste/planning_guidelines/deliverables

Item	Municipal solid waste	Bulky waste	Packaging waste	WEEE	Hazardous waste (WEEE excluded)	Tires	Batteries	C/D waste	End-of-life vehicles	Other waste streams (specify)
Labor (AMD/year)										
Protective clothing and tools (AMD/year)										
Operation and maintenance of equipment (AMD/year)										
Fuel (AMD/year)										
Operation and maintenance of bins (AMD/year)										
Administrative costs (AMD/year)										
Environmental tax (AMD/year)										
Other costs (AMD/year)										
Sub-total										
VAT (20%)										
Total cost (AMD/year)										
Population (person)										
Annual waste generation (thousand tons)										
Unit price cost (AMD/ton)										
Price cost per capita (AMD/person)										
Waste generation per capita (kg/year)										

Table 27 – Price cost for solid waste management per primary streams (data as of current year)




1.8 Monitoring and assessment of previously set objectives

If the SW local management plan is being developed the first time, then this subsection should be skipped.

This section is supposed to provide an assessment for the implementation of objectives set during the previous planning. If the planning is being done for the first time, then assessment can be done according to the objectives defined by the National Strategy on SW.

1.8.1 Ability of the current SW management system to achieve previously set objectives

Previously set objectives per streams must be completed in the table below while coloring each box in a relevant color, according to the following scheme:

	The current SW management system has already achieved the previously set objective
	The current SW management system is capable of achieving the previously set objective
	The current SW management system is not capable of achieving the previously set objective

The implementation of the MSW collection coverage (II) objective within the Planning Area has been presented as an example. For instance, if the plan is developed in 2023 and the MSW collection coverage was previously planned to be raised to 100% by 2025, then this has already been achieved. Therefore, the relevant box needs to be colored green. Following the same example, if the placement of MSW in the landfill was planned to be raised to 60% by 2025, while in 2023 (during the new planning) it became clear that this objective will not be achieved through the current MSW management system, then the color of the relevant box (60%) should be orange. If with previous planning the sorted collection of packaging waste was planned to be raised to 70% by 2025, and as of 2023 (during new planning) it became clear that this would not be achieved with the current MSW management system, then the color of the relevant box (70%) should be blue. We should keep in mind that the indicator for placement in the landfill is available in two options: disposal in all types of landfills, including sanitary ones, and disposal in uncontrolled dumps. If communities within the Planning Area do not use sanitary landfills, then these indicators will be the same. The quantity of waste disposed and placed in landfills is the most important indicator for sustainable SW management. The reduction of this quantity should become a priority objective, not just on the local but also the national level.

- The current SW management system has already achieved the previously set objective
- The current SW management system is capable of achieving the previously set objective
- The current SW management system is **not capable** of achieving the previously set objective

	Waste stream or type (specify, add rows as needed)	Generation per capita (kg/year per capita)	Generation per total annual quantity (thousand t/year)	I	II	III	IV	V	VI	VII	VII	IX	X	XI
				Sorted collection (% of total generated quantity)	Collection (mixed and sorted) (% of total population)	Reuse (% of total generated quantity)	Repurpose (% of total generated quantity)	Recovery (recycling) (% of total generated quantity)	Nutrient recovery (composting) (% of total generated quantity)	Energy recovery in form of fuel (biogas, briquette, biodiesel, RDF) (% of total generated quantity)	Energy recovery (incineration) (% of total generated quantity)	Treatment, neutralization of hazardous waste (% of total generated quantity)	Disposal in uncontrolled dump (% of total generated quantity)	Disposal in landfills (including sanitary landfills) (% of total generated quantity)
1	Municipal solid waste				100								60	
2	Bulky waste													
3	Packaging waste			70										
4	WEEE (electric and electronic devices)													
5	Hazardous waste (WEEE excluded)													
6	Tires													
7	Batteries													
8	C/D waste													
9	End-of-life vehicles													
10	Other waste streams (specify)													
11	Total SW													

Table 28 – Capacity of current SW management system to achieve previously set objectives per handling method

1.8.2 Ability of current SW management system to address environmental, health and occupation safety issues

Data to be completed in the table below: **[not required]**

#	Issue	Ability (Yes/no)	Observations
1	Soil contamination		
2	Underground water pollution		
3	Surface water pollution		
4	Air pollution		
5	Greenhouse gas emissions		
6	Health issues		
7	Occupational safety issues		

Table 29 – Capacity of current SW management system to address environmental, health and occupational safety issues

1.8.3 Administrative and organizational efficiency of current SW management system

Using the analyses in previous subsections (1.5.9, 1.5.10), this subsection should analyze and assess the efficiency of the current SW management system. How effective are the administrative and organizational structures, and what are the factors negatively impacting their efficiency?

Data to be completed in the table below: **[not required]**

#	Actor	Efficiency level (1-very low, 2- low, 3-average, 4-high, 5- very high)	Main causes for inefficiency	Measures and changes required for increasing efficiency	Observations
1	LSG and territorial administration authorities (TAA)				
2	Private sector				
3	EPR				
4	Population				
5	Civil society organizations				

Table 30 – Administrative and organizational efficiency of current SW management system

1.8.4 Statistics and analysis of violations

This subsection describes violations related to waste management within the Planning Area. Data would include the type of liability (disciplinary, administrative or criminal), how the issues were resolved, whether or not the case was satisfied, how many cases went to court, if there are precedent decisions, how many individuals were subjected to liability and how much material damage caused to the community has been restored. If such an analysis has been previously conducted, then the results of it should be included in this subsection.

 Data **must** be completed in the following table:

#	Violation	Date of recorded violation	Violation subject (physical entity, organization)	Type of liability (disciplinary, administrative, criminal)	Cause of violation	Observations (i.e., how issue was resolved, case satisfied or not, etc.)
1						
2						
3						
..						

Table 31 – Statistics and analysis of violations

1.8.5 Analysis of data gaps

Availability of reliable data is of primary importance for the purposes of sustainable SW management. The proposed local SW management plan on one hand records the gaps of required data within the [Current Situation Analysis](#) chapter, and on the other hand, in the chapter on [Planning](#) it foresees relevant measures aimed at the closing of identified data gaps.

Taking into account the tables completed in previous subsections, required missing data should be separated and completed in the following table, based on which relevant measures will be developed. It is also important to analyze and record the causes for the lack of data, i.e., whether data is collected or not, if yes, then whether or not they're available, and if they are available, whether they are reliable or not. This analysis will become the basis for planning interventions aimed at the improvement of procedures and capacities for collection of missing data.

The table **must** be completed.

#	Data type	Collected or not (yes/no)	Available or not (yes/no)	Reliable or not (yes/no)	Observations
1					
2					
...					


Table 32 – Analysis of data gaps

1.8.6 Preliminary list of necessary changes

If the local SW management plan is being developed for the first time, then this subsection should be skipped.

This subsection should give a *preliminary* description of the changes that are required in the *current* SW local management system in order to do the following:

- i. To implement previously set objectives while taking into account the analyses in subsection 1.7.1, particularly with regard to the following in the Planning Area:
 - planned* reduction of generate waste quantity;
 - planned* increase of reused or recovered waste quantity;
 - planned* reduction of waste disposed in environmentally non-compliant (unsanitary) fashion.
- ii. To improve environmental, health and occupation safety characteristics of the current system (considering the analyses in 1.8.2).
- iii. To improve the administrative and organizational efficiency of the current system (considering the analyses in 1.8.3).

 Data **must** be completed in the following three tables:

<i>Preliminary changes within the local SW management system for the implementation of previously set objectives</i>			
#	Objective	Changes required within the current local SW management system	Observations
1	Planned reduction of generated waste		
2	Planned increase of recycled or recovered waste quantity		
3	Planned reduction of waste disposed in environmentally non-compliant (unsanitary) fashion		

Table 33 – Preliminary changes within the existing local SW management system in order to achieve previously set objectives

<i>Preliminary changes required for the improvement of the environmental, health and occupational safety characteristics of the existing local SW management system</i>			
#	Characteristic	Required changes within the current local SW management system	Observations
1	Reduction of soil contamination		
2	Reduction of underground water pollution		
3	Reduction of surface water pollution		
4	Reduction of air pollution		
5	Cutting greenhouse gas emissions		
6	Reduction of health impacts		
7	Improvement of occupational safety		

Table 34 – Preliminary changes required for the improvement of the environmental, health and occupational safety characteristics of the existing local SW management system

<i>Preliminary changes required for the improvement of the administrative and organizational efficiency of the current local SW management system</i>			
#	Main cause of inefficiency (use Table 30)	Changes required in the existing local SW management system (use Table 30)	Observations
1			
2			

Table 35 – Preliminary changes required to improve the administrative and organizational efficiency of the existing local SW management system

2 PLANNING




2 PLANNING

CHAPTER CONTENTS

- 2.1 Forecasts
- 2.2 Assumptions
- 2.3 Setting objectives and targets
- 2.4 Action plan
- 2.5 Long-term development
- 2.6 Budget and funding required for the implementation of planned action
- 2.7 Waste management budgeting

2.1 Forecasts

This section should describe changes predicted or planned within the Planning Area during the planning period.

 Data **must** be completed in the Table below by filling out relevant years of the planning period first. Rows with corresponding numbering may be added as needed.


#	Planned year (i.e.,2021)	2022	2023	2024	2025	2026	Observations
1	Expected number of actual population (person)						
2	Expected changes for new residential areas						
3	Expected changes of economic situation						
4	Expected changes in demand and contents of consumer goods						
5	Expected changes in production types						
6	Expected impact of policy changes (in terms of prevention and reduction, sorting and reuse) i.e., ban on plastic bags or introduction of EPR schemes from 2024, change in environmental tax for landfills, legislative changes, etc.						
7	Expected changes of waste generation sources						
8	Expected new waste treatment and recovery facilities						
9	Expected new facilities for waste disposal and liquidation (including landfills and transfer facilities)						

Table 36 – Changes forecasted during the planning period

2.2 Assumptions

Assumptions are established based on the analysis of the current situation described in the previous chapter, main issues discussed in section 1.2, priorities and vision as well as forecasts made and listed in section 2.1. These analyses might show that in some communities or sectors of the Planning Area, a certain change is expected to happen, which will lead to qualitative and quantitative changes for a given waste type. This will serve as basis for changes in the capacities (collection, sorting, recycling, etc.) required to manage the quantities of forecasted waste.

This section should present the rationale for the assessment of expected waste generation indicators during the planning period. That would include the rationale for the case where no changes in generation indicators are expected, as well as for the case when a certain reduction or growth is expected, for instance, due to population or economic situation changes.

 Data for the planning period **must** be completed in the table below. The level of priority of primary waste streams and types should be assessed and filled out first, along with the expected generation quantity. While calculating the per capita generation of waste expected in the planning period, the forecasted population number in subsection 2.1 should be used.

#	Primary or secondary waste stream	Priority level during planning period (very important, of average importance, not as important)	Expected waste generation per capita during the planning period (kg/year per capita)	Expected waste generation during the planning period per total annual quantity (thousand t/year)	Observations
1	Municipal solid waste				
	A. Organic				
	B. Paper and cardboard				
	C. Plastic				
	D. Glass				
	E. Metals				
	I. Other (specify)				
2	Bulky waste				
3	Packaging waste				
4	WEEE (electric and electronic devices)				
5	Hazardous waste (WEEE excluded)				
6	Tires				
7	C/D waste				
8	End-of-life vehicles				

Table 37 – Expected waste generation during the planning period and availability of waste handling capacities

2.3 Setting objectives and targets (mid-term and long-term)

Based on the results of the work conducted with the involvement of multi-stakeholder groups described in section [1.2 on “Primary issues, priorities, vision,”](#) this section should identify the goals and targets for SW management for the planning period. The goals and targets refer to SW quantities according to their handling, distribution of roles and responsibilities among stakeholders, capacities (including staff) required for sustainable SW management, data collection, awareness and level of staff capacities.

2.3.1 SW quantity targets in planning period


As mentioned in previous sections, the ultimate goal of any strategic planning for sustainable SW management is the reduction of waste quantity disposed in landfills (including sanitary landfills) based on both total disposed quantity (thousand t/year) and percentage of total generated quantity. This must be the main goal of planning. This goal can be achieved through the reduction, reuse, repurpose, treatment, recovery of waste, for which an important prerequisite is sorting (sorted collection or factory sorting).

Primary and secondary waste streams that have been assessed as very important or of average importance should be filled in the table below while using the info in Table 37. Then, targets for individual SW handling methods should be established.

The following handling methods **must** be established:

- (I) sorted collection
- (II) mixed and sorted collection *
- (V) nutrient recovery increase (recycling of glass, plastic, paper and metal waste)
- (IX) increase in treatment of hazardous waste (treatment, neutralization)
- (XI) reduction of waste quantity disposed in landfills (including sanitary landfills)

* If waste collection coverage is currently not 100% within the Planning Area and a certain portion of the population (i.e., 28%) does not yet receive waste collection services, then establishing this target is a must. For instance, in 2 years the percentage of the population receiving waste collection services has gone from 72% to 90%, and in 5 years, this figure has reached 100%.

 And finally, the ability to achieve set targets in case of expected generation quantities **must** be assessed based on the given color scheme.

The capacities of the current SW management system **are sufficient** to achieve the set target

The capacities of the current SW management system are insufficient to achieve the set target

#	Primary or secondary waste stream	Level of priority in planning period (very important, of average importance, not as important)	Expected waste generation per capita during the planning period (kg/year per capita)	Expected waste generation per total annual quantity during the planning period (thousand t/year)	Short-term targets for solid waste handling and availability of capacity to achieve this during the 2022-2024 planning period											Observations	
					I	II	III	IV	V	VI	VII	VII	IX	X	XI		
					Sorted collection (% of total generated quantity)	Collection (mixed and sorted) (% of total population)	Reuse (% of total generated quantity)	Repurpose (% of total generated quantity)	Recovery (recycling) (% of total generated quantity)	Nutrient recovery (composting) (% of total generated quantity)	Energy recovery in form of fuel (biogas, biodiesel, RDF) (% of total generated quantity)	Energy recovery (incineration) (% of total generated quantity)	Treatment, neutralization of hazardous waste (% of total generated quantity)	Disposal in uncontrolled dump (% of total generated quantity)	Disposal in landfills (including sanitary landfills) (% of total generated quantity)		
1	Municipal solid waste																
	A. Organic																
	B. Paper and cardboard																
	C. Plastic																
	D. Glass																
2	Bulky waste																
3	Packaging																
4	WEEE (electric and electronic devices)																
5	Hazardous waste (WEEE excluded)																
6	Tires																
7	C/D waste																

Table 38 – Short-term SW handling targets and availability of capacity for achieving them during the planning period


The capacities of the current SW management system **are sufficient** to achieve the set target

The capacities of the current SW management system are insufficient to achieve the set target

#	Primary or secondary waste stream	Level of priority in planning period (very important, of average importance, not as important)	Expected waste generation per capita during the planning period (kg/year per capita)	Expected waste generation per total annual quantity during the planning period (thousand t/year)	Mid-term targets for solid waste handling and availability of capacity to achieve this during the 2024-2026 planning period											Observations	
					I	II	III	IV	V	VI	VII	VII	IX	X	XI		
					Sorted collection (% of total generated quantity)	Collection (mixed and sorted) (% of total population)	Reuse (% of total generated quantity)	Repurpose (% of total generated quantity)	Recovery (recycling) (% of total generated quantity)	Nutrient recovery (composting) (% of total generated quantity)	Energy recovery in form of fuel (biogas, briquette, biodiesel, RDF) (% of total generated quantity)	Energy recovery (incineration) (% of total generated quantity)	Treatment (treatment, neutralization of hazardous waste) (% of total generated quantity)	Disposal in uncontrolled dump (% of total generated quantity)	Disposal in landfills (including sanitary landfills) (% of total generated quantity)		
1	Municipal solid waste																
	A. Organic																
	B. Paper and cardboard																
	C. Plastic																
	D. Glass																
2	Bulky waste																
3	Packaging																
4	WEEE (electric and electronic devices)																
5	Hazardous waste (WEEE excluded)																
6	Tires																
7	C/D waste																

Table 39 – Long-term targets for SW handling and availability of capacity to reach them in the planning period

2.3.2 Distribution of roles and responsibilities among different actors during the planning period (revision and allocation of roles)

 In this section the two tables presented in section 1.5.9 (Table 17 and Table 18) **must** be revised and amended in accordance with the new planning.

#	Current stakeholder	Awareness-raising (%)	Sorted collection (%)	Mixed, unsorted collection (%)	Transportation (%)	Factory sorting (%)	Reuse (%)	Repurpose (%)	Recycling (%)	Energy recovery (%)	Treatment (%)	Disposal in landfill (%)
1	Local self-government (LSG)											
2	Private sector (PS)											
3	EPR											
4	Population											
5	Civil society organization (CSO)											


Table 40 – Level of engagement of stakeholders in local SW management (during the planning period)

#	Waste stream or type (specify, add rows as needed)	Awareness-raising	Sorted collection	Mixed, unsorted collection	Transportation	Factory sorting	Reuse	Repurpose	Recycling	Energy recovery	Treatment (%)	Disposal in landfill
1	Municipal solid waste											
2	Bulky waste											
3	Packaging											
4	WEEE (electric and electronic devices)											
5	Hazardous waste (WEEE excluded)											
6	Tires											
7	Batteries											
8	C/D waste											
9	End-of-life vehicles											
10	Other waste streams (specify)											

Table 41 – Level of engagement of stakeholders in local SW management according to waste streams (during the reporting period)

2.3.3 Capacity building for staff in the planning period


The table presented in 1.5.10 (Table 18) should be amended according to the new planning and inserted in this section.

 Data **must** be completed in the table below. First three columns of the table must be completed from Table 18, and a target should be established for skills.

#	Skill or sector	Number of employees with this skill	Current level of this skill (1-very low, 2- low, 3-average, 4-high, 5-excellent)	Targeted level for this skill (1-very low, 2- low, 3-average, 4-high, 5-excellent)	Observations
1	Data collection				
2	Computer-based mapping				
3	Procurements management				
4	Contract management				
5	Operational skills				
6	Waste management knowledge				
7	Armenian legislation knowledge				


Table 42 – Targets for staff skills improvement

2.3.4 Public awareness during planning period

 The table in section 1.6.1 (Table 20 – current level of public awareness) **must** be amended according to the new planning and inserted in this section.

#	Sector or field	Current level of awareness (1-very low, 2- low, 3-average, 4-high, 5-excellent)	Targeted level of awareness (1-very low, 2- low, 3-average, 4-high, 5-excellent)	Observations
1	Environmental impacts of poor waste management			
2	Social impacts of poor waste management			
3	Economic impacts of poor waste management			
4	Impacts of moving waste to landfills			
5	Knowledge of waste hierarchy			
6	Benefits of waste reduction			
7	Benefits of sorted waste collection			
8	Benefits of waste reduction and reuse			
9	Benefits of waste reuse			
10	Benefits of waste recovery			

2.3.5 Waste handling map according to new planning

 The map that has been developed and presented in section 1.5.11 **must** be revised and amended according to the new planning. In addition to the new map, this section can include necessary description in text.

2.4 Action plan (short-term and mid-term)

This section should develop and present measures for achieving the goals and targets identified in section 2.3. These could include organizational and infrastructure changes. A couple of examples of such changes are presented below.

Sorted collection capacities

To attract recycling companies and investors, it is vital to have sorted waste collection in the community with high extraction numbers – maximum low composition of other wastes within the mass of sorted wastes. Sorting schemes should be gradually introduced in communities where there is only mixed waste collection. These schemes should correspond to the composition, quantity and other features of wastes generated in the community while working in parallel to improve public awareness.

For instance, a shift can be made from mixed collection with mobile trucks to sorted collection with mobile trucks following a certain schedule. On certain days of the week, only recyclable waste (plastic, glass, paper) can be collected, while mixed collection of the rest of the waste can be done daily or according to a certain schedule while adhering to requirements set by Armenian legislation.

It will be essential to also gradually introduce separate sorted collection of biodegradable waste, which will make the handling of recyclable waste more effective. Organization of sorted collection and special handling of hazardous waste contained in municipal solid waste is of particular importance. The list of some hazardous wastes contained in unsorted municipal solid wastes is presented in Appendix B.

Operator capacities

Increasing sorted collection in order to reach the target level within the Planning Area might require changing the current operator, adding a new one or revising the existing contract terms. In addition to that, there might be a need for staff training, increasing public awareness, as well as changes and revisions of schedules and logistics.

Analyses presented in section 1.5.2 and targets set in 2.3 should be considered when developing measures aimed to boost operator capacities.

Separate collection systems

To ensure more effective and sustainable management of bulky waste and meeting the targets for their disposal in landfills, separate collection centers should be established, which will also contribute to the sustainable development of other waste streams and meeting targets. Similar systems should also be designed for other streams like packaging, green waste, garden waste and other specific waste types.

Composting and biogas capacity

To reduce disposal of biodegradable waste in landfills, increase recycling and thus meet targets, mechanisms for sorted collection and treatment (composting and biogas production) should be planned along with awareness projects. There are different solutions for the handling of biodegradable waste which do not require large investment. These include community composting and composting on the farm or biogas production, fodder or fuel production. For best available practice on biodegradable waste handling, see APPENDIX C -Useful resources.

Transfer facilities

In order to bring the coverage of sorted and mixed collection of waste to the target level or to increase current efficiency, there might be a need to establish transfer facilities, which should also be considered in a wider context of landfill management.

Analyses presented in section 1.5 and targets defined in section 2.3 should be taken as a basis when developing measures related to the transfer facilities.

Temporary storage of waste and other supporting capacities

To increase treatment of generated waste to the target levels, different recycling facilities will be needed that will be

located outside the Planning Area. In this case, cost-efficiency measures should be developed for the transportation of recyclable waste. For instance, transportation of plastic bottles or polyethylene bags is less costly if these are first shredded and compressed using special equipment. The acquisition of such equipment in the community as well as creating temporary storage areas will be a local SW management planning measure aiming to reach treatment targets for waste.

Analyses done in section 1.5 and targets defined in section 2.3 should be taken into account when developing measures related to temporary storage of waste and improvement of other supporting capacities. Measures looking to waste chutes (if available) might be required to improve sanitary conditions of waste collection in apartment buildings as well as for shifting to sorted waste collection.

Staff capacities

In order to reach waste sorting, recycling and recovery targets within the Planning Area, basic knowledge and practical skills are required on sustainable waste management. One of the key components of local SW management planning is the improvement of staff capacities through workshops, trainings, certifications, etc. The analysis presented in 1.5.10 and targets set in section 2.3 should be considered while developing measures looking to improve staff capacities.

Data collection

As was already mentioned, availability of reliable data is essential for sustainable management of SW. The proposed local SW management plan records gaps of required data in the chapter on the current situation analysis (Table 32 of section 1.8.5). On the other hand, some data might be missing in terms of the new targets. Therefore, measures aimed at the improvement of collection procedures and capacities should be foreseen during the planning period. The analysis presented in section 1.8.5 and targets set in 2.3 should be considered when developing measures related to data collection.

Landfills and dumpsites

Improvement of local SW management includes improvement of existing landfills and related infrastructure. For instance, in order to have clear data on the quantity of waste disposed in landfills, scales should be installed in landfills. The expediency of these scales should be determined case by case. Another example would be installation of procedures and infrastructure (checkpoints, etc.) for accepting and refusing waste in order to control the disposal of biodegradable and other type of wastes. Improving access roads to landfills should be foreseen during the planning period in order to reduce maintenance costs for trucks and safety risks for the staff.

The analysis presented in section 1.5.7 and targets set in 2.3 should be considered as basis when developing measures related to landfill and dumpsite management.

Informal sector

During the planning period some work might be required with the informal sector in order to engage them in sustainable SW management practices, i.e., in the context of improving waste sorting procedures and infrastructure. The same will apply not only to municipal waste but also to the packaging waste contained in the commercial/industrial stream, which is a major stream covered by the informal sector.

The analysis presented in section 1.5.5 and targets set in section 2.3 should be considered as basis when developing measures related to data collection.

Completing the table of measures



The list of measures aimed at the achievement of above-mentioned and other goals **must** be completed based on the forecasts made in section 2.1, the assumptions set in section 2.2. as well as the targets set in section 2.3 and analyses made in the chapter on the Current Situation Analysis.

#	Goal	Short-term target	Short-term measure	Mid-term target	Mid-term measure	Observations
	SW quantity per handling methods					
I required	Sorted collection					
II required*	Collection (mixed and sorted)					
III	Reuse					
IV	Repurpose					
V required	Recovery (recycling)					
VI	Nutrient recovery (composting)					
VII	Energy recovery in form of fuel					
VIII	Energy recovery (incineration)					
IX required	Treatment (treatment, neutralization of hazardous waste)					
X	Disposal in uncontrolled dumps					
XI required	Disposal in landfills (including sanitary landfills)					

Table 43 – Action plan for achieving short-term and mid-term targets

* If the waste collection coverage within the Planning Area is not currently at 100%, i.e., there is a certain portion of the population (i.e., 28%) that does not yet receive waste collection services, then this target must be established. For instance, this target might be to increase the percentage of the population receiving waste collection services from 72% to 90% within 2 years, and to make it 100% within 5 years.

2.5 Long-term development

In addition to short-term and mid-term planning, any SW local management plan should consider longer-term perspectives. This is done as there may be difficulties with setting up new facilities for waste recovery or treatment, closing old landfills or improving them, developing new sanitary landfills and ensuring their accessibility. In such cases, getting relevant permissions and licenses are components that take a lot of time and effort. This includes environmental and social impact assessments, public hearings, and other activities. The introductions of waste recovery or other waste handling facilities is time-consuming also in terms of payback. Thus, considering the local SW management plan for the long term is important also in the sense of financial and economic assessment. While considering future investments in new facilities, it is critical during the planning to foresee the implementation of required studies especially on the regional level.

 Data **must** be completed in the following table:

#	Planned facility for waste handling	Waste type	Facility capacity (thousand t/year)	Year of planned launch	Studies required	Observations
1						
2						
3						

Table 44 – Future investments and required studies for new waste handling facilities (for the long-term)

2.6 Budget and funding required for planned activities

This section describes the budgets and funding required for the implementation of planned activities presented in Table 43. This includes operational costs, capital investments, and financing means. The budget and funding of short-term and long-term measures are presented.

2.6.1 Budget and funding of short-term measures

#	Goal/set target for measure	Measure	Measure cost (thousand AMD)	Project implementation per first two planned years		Project funding sources					Observations
				I year (thousand AMND)	II year (thousand AMND)	Self-coverage (thousand AMD)	Community budget (thousand AMD)	State budget (thousand AMD)	Donor organization (thousand AMD)	Community non-commercial organization budget (thousand AMD)	
1											
2											
3											
4											
..											
	Total										

Table 45 – Budget and funding for short-term measures

2.6.2 Budget and funding of mid-term measures

#	Goal/set target for measure	Measure	Measure cost (thousand AMD)	Project implementation per third, fourth and fifth planned years			Project funding sources					Notes
				III year (thousand AMND)	IV year (thousand AMND)	V year (thousand AMND)	Self-coverage (thousand AMD)	Community budget (thousand AMD)	State budget (thousand AMD)	Donor organization (thousand AMD)	Community non-commercial organization budget (thousand AMD)	
1												
2												
3												
4												
..												
	Total											

Table 46 – Budget and funding of mid-term measures

2.6.3 Detailed workplan and budget of individual measures

A. Measure number and title

#	Measure	Capital investments (thousand AMD)	Operational costs (thousand AMD)	Other costs (specify in observations) (thousand AMD)		Observations
1						
2						
3						

Table 47 – Measure (A) – Detailed workplan and budget

B. Measure number and title

#	Measure	Capital investments (thousand AMD)	Operational costs (thousand AMD)	Other costs (specify in observations) (thousand AMD)		Observations
1						
2						
3						

Table 48 - Measure (B) – Detailed workplan and budget

2.7 Waste management budgeting

2.7.1 General description of income and expenditures during the planning period

	Income (thousand AMD)	Expenses (thousand AMD)	Balance (thousand AMD)	Observations
I year				
II year				
III year				
IV year				
V year				

Table 49 – Forecasted income and expenditures for waste management within the Planning Area during the planned years

	Population (thousand AMD)	OCFs (thousand AMD)	Other sources (specify) (thousand AMD)	Observations
I year				
II year				
III year				
IV year				
V year				

Table 50 – Forecasted income from the population, OCFs and other sources during the planned years

2.7.2 Planned cost price for waste management per primary streams

Item name	Municipal solid waste	Bulky waste	Packaging	WEEE	Hazardous waste (WEEE excluded)	Tires	Batteries	C/D waste	End-of-life vehicles	Other waste streams (specify)
Labor (AMD/year)										
Protective clothing and tools (AMD/year)										
Equipment maintenance and operation (AMD/year)										
Operation and maintenance of bins (AMD/year)										
Administrative costs (AMD/year)										
Environmental tax (AMD/year)										
Other costs (AMD/year)										
Sub-total										
VAT (20%)										
Total cost (AMD/year)										
Population										
Annual waste generation (thousand tons)										
Unit cost price (AMD/ton)										
Actual cost price per person (AMD/per capita)										
Quantity of waste generated per capita (kg/year)										

Table 51 – Forecasted price cost for solid waste management per primary streams (during the planning period)

APPENDIX A – Structure of local SW management plan

1 CURRENT SITUATION ANALYSIS

- 1.1 INTRODUCTION (Plan Summary)
- 1.2 PRIMARY ISSUES, PRIORITIES, VISION
- 1.3 DESCRIPTION OF PLANNING AREA
 - 1.3.1 Description of Planning Area per area types
 - 1.3.2 Geographic boundaries
 - 1.3.3 Demographic information
 - 1.3.4 Type and quantity of main waste generation sources
- 1.4 WASTE QUANTITY AND COMPOSITION
 - 1.4.1 Waste quantity per streams and types of their handling
 - 1.4.2 Waste composition by fractions
- 1.5 WASTE HANDLING
 - 1.5.1 SW collection
 - 1.5.2 Current waste management operators
 - 1.5.3 Transportation schemes
 - 1.5.4 Reuse and preparation for reuse
 - 1.5.5 Informal section (sorting at the source or at landfills)
 - 1.5.6 Waste treatment plants
 - 1.5.7 Landfills and dumpsites
 - 1.5.8 Landfill access roads
 - 1.5.9 Distribution of roles and responsibilities among various stakeholders
 - 1.5.10 Assessment of staff capacities
 - 1.5.11 Waste handling map
- 1.6 CURRENT LEVEL OF AWARENESS
 - 1.6.1 Awareness assessment method
- 1.7 FUNDING AND BUDGET
 - 1.7.1 Overview of income and expenditures
 - 1.7.2 Details of current waste management fees per primary streams
 - 1.7.3 Cost of available waste handling
 - 1.7.4 Existing cost price for SW management per primary streams
- 1.8 MONITORING AND ASSESSMENT OF PREVIOUSLY SET OBJECTIVES
 - 1.8.1 Ability of the current SW management system to achieve previously set objectives
 - 1.8.2 Ability of current SW management system to address environmental, health and occupation safety issues
 - 1.8.3 Administrative and organizational efficiency of current SW management system
 - 1.8.4 Statistics and analysis of violations
 - 1.8.5 Analysis of lack of data (gaps)
 - 1.8.6 Preliminary list of current objectives

2 PLANNING

- 2.1 FORECASTS
- 2.2 ASSUMPTIONS
- 2.3 IDENTIFICATION OF GOALS AND TARGETS (MID-TERM AND LONG-TERM)
 - 2.3.1 SW quantity targets in planning period
 - 2.3.2 Distribution of roles and responsibilities among different stakeholders (revision and allocation of roles)
 - 2.3.3 Improvement of staff skills during the planning period
 - 2.3.4 Public awareness during planning period
 - 2.3.5 Waste handling map according to new planning
- 2.4 ACTION PLAN (SHORT-TERM AND MID-TERM)

- 2.5 LONG-TERM DEVELOPMENT
- 2.6 BUDGET AND FUNDING REQUIRED FOR PLANNED ACTIVITIES
 - 2.6.1 Budget and funding of short-term measures
 - 2.6.2 Budget and funding of mid-term measures
 - 2.6.3 Detailed workplan and budget of individual measures
- 2.7 WASTE MANAGEMENT BUDGETING
 - 2.7.1 General description of income and expenditures during the planning period
 - 2.7.2 Planned cost price for waste management per primary streams

APPENDIX B - Incomplete list of hazardous wastes commonly contained in mixed, unsorted municipal solid waste

Unsorted waste from permanent and temporary places of residence (bulky waste excluded)
Unsorted waste generated in domestic spaces of organizations (bulky waste excluded)
Contaminated glass waste
Other contaminated textile waste
Asbestos paper and asbestos waste
Basalt fiber waste
Cotton slag waste
Processed perlite (filter, powder)
Damaged or used medical needles
Used disposable syringes
Light bulbs
Electric and electronic devices
Paper tape waste
Different types of paper and cardboard (i.e., waste containing photo paper)
Expired hygiene products
Expired food in glass and metal containers
Expired food cans in glass and metal containers
Expired food
Paint waste
Varnished paper waste
Solvents or old varnishes or paints containing heavy metals, as well as dry residues in barrels
Lighting devices
Resin, paste, adhesives, and glue waste
Cosmetics
Asbestos waste in form of fabric
Containers with residues of cleaning fluids
Ash
Oily hemp (oil content less than 15%)
Foods high in sodium salts
Construction waste from the demolition of buildings
Construction timber waste, including from demolition and dismantling of buildings
Canned and frozen food scraps (meat, fish)
Canned and frozen products (fruits, vegetables)
Concrete wall items, poles, damaged and contaminated concrete slabs
Hardened old varnishes, paints, as well as solid residues in barrels and containers
X-ray-photo film waste
Rubber-asbestos waste (including manufactured items and faulty products)
Cleaning materials contaminated with glue
Harmful (dangerous) food additives or foods containing dyes

Fragments of heating and combustion equipment
Tar paper waste
Oily wood waste (poles, masts)
Damaged or used medical containers
Rotten, contaminated or unlabeled food
Chemicals and gases in high pressure cylinders and technical aerosol containers (spoiled, damaged, or having lost their protective properties due to other reasons)
Used gas burners
Used batteries
Photo paper waste

APPENDIX C – Useful resources

Templates and other planning instruments discussed above (i.e., cost price calculation tool) will be available here: https://ace.aua.am/hy/waste/planning_guidelines/deliverables

Links to discussed and other important materials can be found below.

Strategies and reports

- i. RA Government program 2019
<https://www.gov.am/files/docs/3562.pdf>
- ii. Armenia Solid Waste Management System Development Strategy for 2017-2036 (ARM)
<http://www.mtad.am/files/docs/1552.pdf>
- iii. Strategy for the introduction of extended producer (importer) responsibility system for products (ARM)
<http://www.irtek.am/views/act.aspx?aid=94848/>
- iv. Cleaner production concept (ARM)
<http://www.irtek.am/views/act.aspx?aid=64672/>
- v. 2010-2020 Strategy of Sustainable Development of Armenia's agriculture (ARM)
http://old.minagro.am/public/uploads/2014/02/aqstrategy_arm3.pdf
- vi. EU-Armenia Comprehensive and Enhance Partnership Agreement (CEPA) Roadmap
https://www.moj.am/storage/uploads/CEPA-Roadmap_ENG-Draft_June-2018.pdf
- vii. RA Statistical Committee, Waste Management in Armenia 2019
https://www.armstat.am/file/article/eco_book_2019_10.pdf
- viii. RA Statistical Committee, Environmental taxes and payments for nature use 2019
https://www.armstat.am/file/article/eco_book_2019_13.pdf
- ix. RA Statistical Committee, Environment and Natural Resources in the Republic of Armenia for 2019
<https://www.armstat.am/am/?nid=82&id=2301>
- x. Bolagen, Waste Quantity and Composition Study, MTAI, AUA Acopian Center for the Environment, 2019
<https://ace.aua.am/files/2020/08/WQCS-Report-Eng.pdf>
- xi. AUA Acopian Center for the Environment. (2020). WASTE GOVERNANCE IN ARMENIA. American University of Armenia and Life Foundation
<https://ace.aua.am/files/2020/08/WGA-Report-Eng.pdf>

Manuals and guidelines

- xii. RA MTAI, 2020, PARTICIPATORY BUDGETING (HANDBOOK)
<http://www.mtad.am/files/docs/2817.pdf>
- xiii. Sisian Adult Education Center, Documents required for implementing participatory budgeting (methodology, workplan, guideline, etc.) (ARM)
https://pbudgeting.am/?page_id=702
- xiv. USAID/The Urban Foundation, PURE Water: Participatory Utilization and Resource Efficiency of Water, Participatory Project Development Guide
<https://urbanfoundation.am/march-2017-march-2020-pure-water-participatory-utilization-and-resource-efficiency-of-water-partners-country-water-partnership-ngo-environmental-law-and-research-center-ysu-2/>

APPENDIX D –Reporting template for implementation of local SW management plan

This report is submitted to the relevant authority in the 2nd and 4th year of the planning period.

Report summary

The following general information is to be presented prior to the report summary:

	<i>Example</i>
Report title	<i>REPORT ON THE SHORT-TERM (or mid-term) IMPLEMENTATION OF MUNICIPAL SOLID WASTE MANAGEMENT IN VARDASHEN COMMUNITY 2021-2025</i>
Community(ies) included in planning	Vardashen
Type of report	Short-term
Report type and period	Short-term, 2021-2022
Name, last name, position of individual developing the report	
E-mail addresses of individuals developing the report	
URL for downloading the digital version of the Plan	

The summary should include all strategic documents on the Planning Area (development plan, etc.) that are in any way associated with the local SW management plan. It should also include whether the proposed plan includes a waste reduction program or if this is planned separately.

Achieving defined goals and targets

This section describes the extent (%) to which goals and targets defined in the Plan (which is an item of the report) have been achieved. This must be assessed following the above-mentioned color scheme. Since the report can be for different timeframes, then the relevant table of the Plan and the schedule of the report (noted below) should be used.

The short-term target defined in the Plan has been achieved

The short-term target defined in the Plan has not been achieved

#	Primary or secondary waste stream	Level of priority in planning period (very important, of average importance, not as important)	Expected waste generation per capita during the planning period (kg/year per capita)	Expected waste generation per total annual quantity during the planning period (thousand t/year)	Short-term targets for solid waste handling and availability of capacity to achieve this during the 2021-2022 planning period											Observations	
					I	II	III	IV	V	VI	VII	VIII	IX	X	XI		
					Sorted collection (% of total generated quantity)	Collection (mixed and sorted) (% of total population)	Reuse (% of total generated quantity)	Repurpose (% of total generated quantity)	Recovery (recycling) (% of total generated quantity)	Nutrient recovery (composting) (% of total generated quantity)	Energy recovery in form of fuel (biogas, briquette, biodiesel, RDF) (% of total generated quantity)	Energy recovery (incineration) (% of total generated quantity)	Treatment, neutralization of hazardous waste (% of total generated quantity)	Disposal in uncontrolled dump (% of total generated quantity)	Disposal in landfills (including sanitary landfills) (% of total generated quantity)		
1	Municipal solid waste																
	A. Organic																
	B. Paper and cardboard																
	C. Plastic																
	D. Glass																
2	Bulky waste																
3	Packaging																
4	WEEE (electric and electronic devices)																
5	Hazardous waste (WEEE excluded)																
6	Tires																
7	C/D waste																

Table 52 – Achieving set goals and targets in the reporting period.

Analysis of partially achieved goals

This section should analyze the goals and targets whose implementation has not been possible during the reporting period. The analysis mainly touches upon the causes and follow-up activities. Capacity needs for achieving the targets and goals set in the current plan should also be revised.

#	Goal not achieved	Planned target	Extent of actual implementation	Cause(s) for partial implementation	Follow-up activities (measures aimed at the elimination of causes or rationale for revision of target)	Observations
1	(i.e., mixed and sorted collection of municipal solid waste (% of the total population))	100%	90%	Cause 1 Cause 2 ...		
2	(i.e., B. sorted collection of paper and cardboard waste)	20%	5%	Cause 1 Cause 2 ...		
3						
4						
5						

Table 53 – Analysis of partially implemented goals during the reporting period

Analysis of the need for changes in current SW management plan

This section should include provisions in the current plan that are subject to change, along with their justifications.

APPENDIX E – Some baseline data required for planning of local SW management

Waste generation

The table below presents data published by the RA Statistical Committee. *Environment and Natural Resources in RA 2019*: https://www.armstat.am/file/article/eco_book_2019_10.pdf

Year	2015	2016	2017	2018	2019
Waste quantity, thousand tons	47 831.3	55 661.1	60 116.4	67 616.1	67 890.8
Waste quantity per capita, t.	15.9	18.6	20.2	22.8	22.9
Waste quantity per square km, t.	1 680.3	1 955.3	2 111.9	2 375.0	2 385.2
Community waste quantity per capita, kg	164.0	167.0	165.8	158.3	159.6
Community waste generate per urban resident, kg	249.3	259.2	257.1	237.1	245.5

Table 54 – Main indicators for annually generated waste, 2015-2019, RA Statistical Committee

The table below presents MSW generation per capita according to a study conducted in 2019 by the Swedish Bolagen consulting firm.

Urban/Marz (province)	Waste quantity (kg/m, t.)	Waste management coverage (%)	Adjusted waste quantity (kg/m, t.)
Yerevan	287	100	287
Marzes (provinces)	85	70	121
Total			196

Waste composition

The data below presents the results of the Waste Composition Analysis (WCA) of solid municipal waste conducted in Armenia in 2019 by the Swedish Bolagen consulting firm. The results include data for different streams, fractions, and geographic locations.

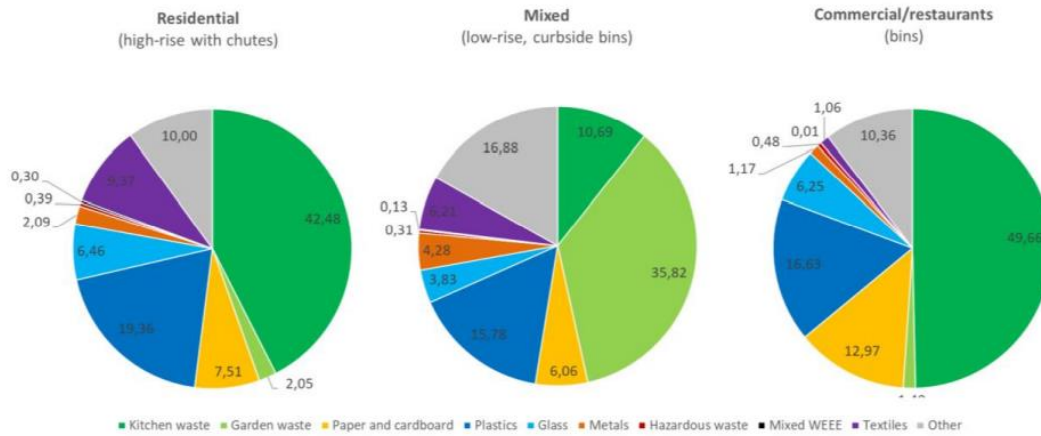


Figure 6 - Waste composition by weight in Yerevan per fraction

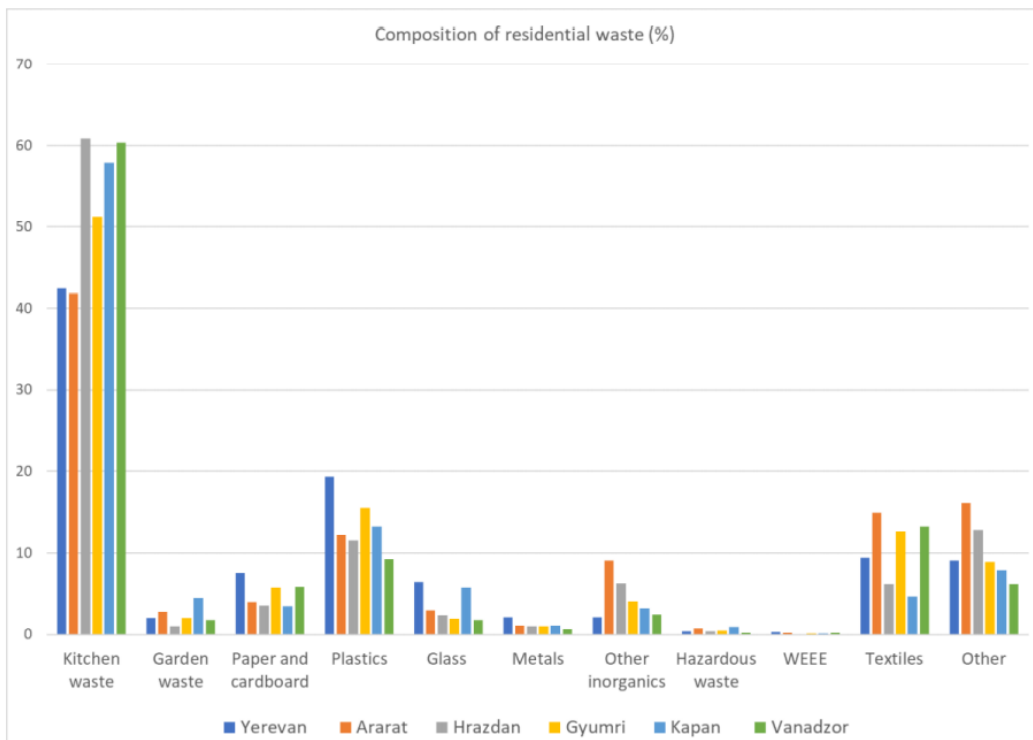


Figure 7 - Comparison of WCA results per main fractions from household waste¹⁶ in the six test cities.

¹⁶ Waste collected from chutes or bins in residential areas with high density and multi-story buildings.

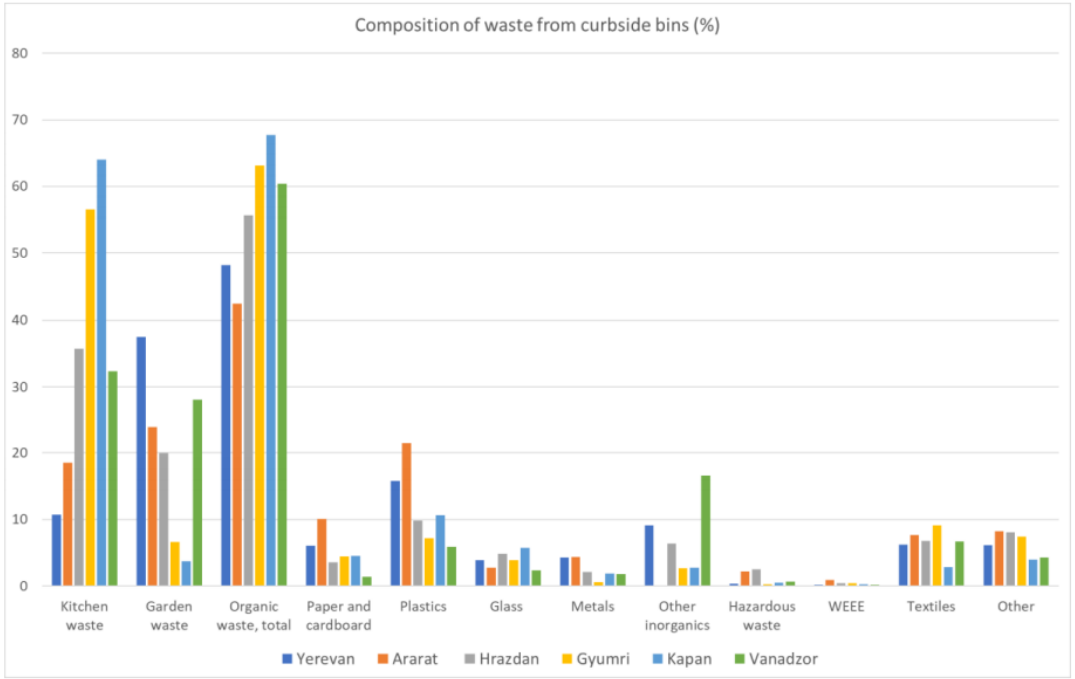


Figure 8 - Comparison of WCA results per main fractions from waste in curbside bins in the six test cities

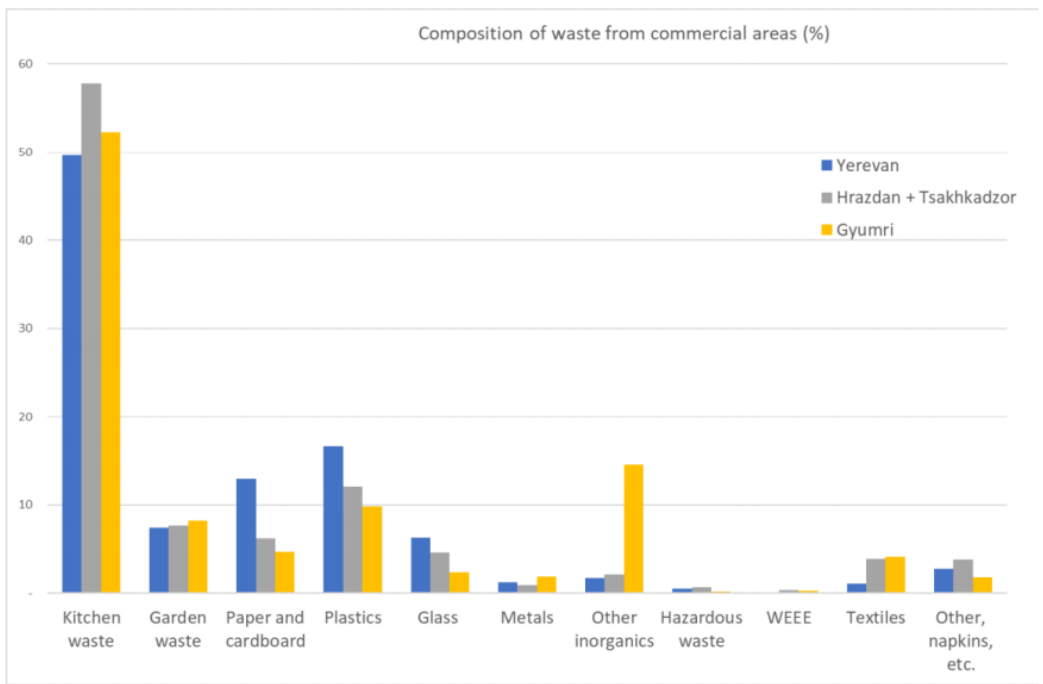


Figure 9 - Comparison of WCA results per main fractions in commercial areas in three cities

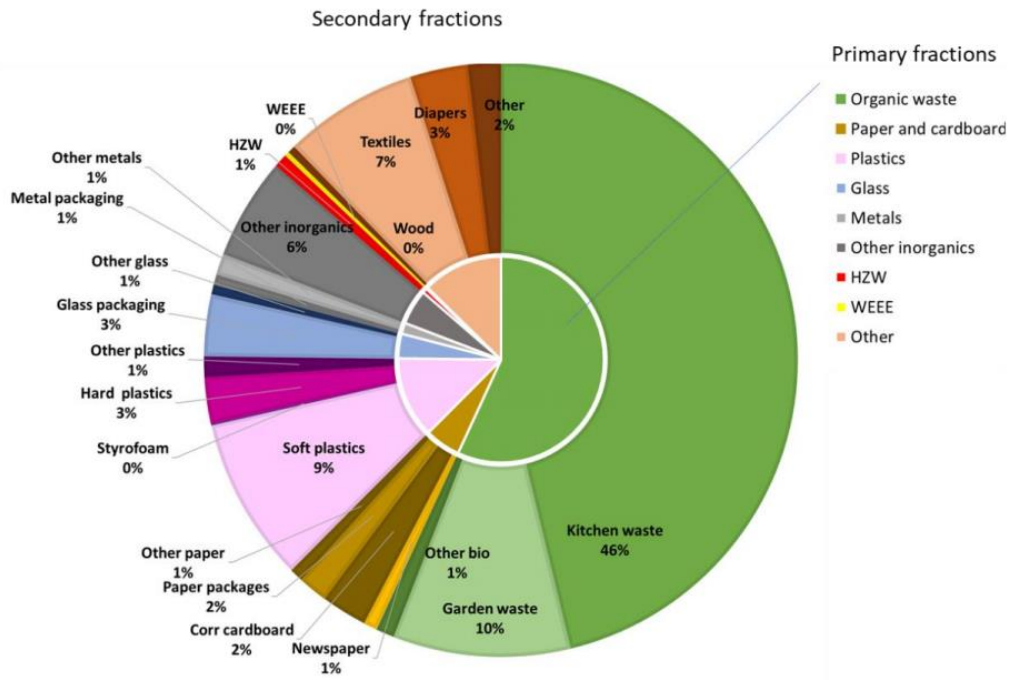


Figure 10 - Average shares of each primary (inner circle) and secondary fraction (outer circle) in all six test cities