Benchmarks Indicators for Urban Waste Service Provision

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Contents

List of Tables

Introduction

This document presents some initial first efforts to enable the design of several indicators measuring the performance of waste management services at the local level and the performance in terms of the implementation of waste management policies at the central level.

Dldp Program (Decentralization and Local Development Program) with an activity of more than 8 years, mainly in the northern areas of the country and not only, has already become an important partner in the waste sector in Albania. This program through the financial and technical assistance among others has aimed at improving the quality of service delivery by the LGU. So in terms of urban waste management the program has assisted the LGUs in planning and implementing the waste management plans in order to achieve the national objectives.

However in the urban sector of the waste management there are no indicators of service delivery performance, which should be clearly defined, measured and reported in the past. Consequently, planning and implementation of local plans of waste management is not sufficient to improve the performance of local authorities in waste management. The design and assignment of several measurable and comparable indicators would be a favorable orientation in terms of improving the quality of waste management and monitoring of this service.

Why do we need standards?

Solid waste management (SWM) is one of the most important services that the Local Government Units (LGUs) provide to the citizens and from the quality of which public health depends directly. Moreover, a failure in SWM will be associated with negative impacts on tourism, economy, environment and politics.

How can we judge the LGUs performance in terms of SWM service delivery?

SWM is offered by the municipal enterprises or by private companies contracted by the LGU. In some special cases this service is offered as collaboration between two or more LGUs. Both, in the case when the service is provided by the municipality and when it is contracted out, its budget (contract) in most cases is based on the amount of disposed waste (reported in each month). Consequently, in almost all contracts, in the absence of the quality standards of the provided service, it is reflected on the lack of measurable performance criteria of the service provided.

What shall we mean by “good practices” in SWM?

Waste collection and transportation service is offered in almost all urban areas in country, but we cannot say the same for rural areas (besides, even when provided it does not cover the whole territory). Additionally, waste management is realized today in Tirana and Shkodra

only. In most cases the waste is stored in open fields, which operate in complete absence of any hygiene and sanitation standard.

Do the LGUS have the opportunity to provide an efficient service and above all affordable?

The level of tariffs, for every service customer category, is not directly related to the level of benefit (the amount of waste they produce), and therefore they do not fully reflect the principle of "polluter - pays".

It's not yet clear if the amount of the fee fully covers or not the operations of collection and transportation of waste. Further, the tariffs not only fail to reflect any process of waste treatment or processing, but they also do not reflect any supervision or follow up or after care for them (such standards are still not clearly defined). Moreover the level of tariffs should reflect the quality of the offered service, but with the lack of service delivery standards, this reflection turns into an impossible mission.

Tariffs collection rates are very low and there are no policies oriented toward the service recovery costs in any of the LGUs.

What will be the focus (priority) for the LGUs in improving the quality of service, with the current limited funds?

The traditional way of calculating the service cost has no correlation with its quality. Direct investments in improving infrastructure are primarily in the donors agenda since with the available budgets it is nearly impossible for the LGUs to make such investments. The indicators measuring the service performance are absent, turning the periodic reports of monitoring the quality of service into unreliable documents.

LGUs with limited capacity (human and financial) are currently in a transition period where they should shift from simply providing the service (collection – dumping - storage) towards an integrated and sustainable management of waste, which includes the recovery of resources as well (meeting national targets for recycling and composting). In the conditions in which LGUs operate today, under the lack of service delivery standards and the absence of its performance measurement indicators, policies devised at central level run the risk to not find the proper "ground" to be implemented at the local level.

Definitions

The standards are used to measure and compare the performance of service delivery through service performance monitoring over time using quantitative and qualitative data.

Service quality standards (Service Level Benchmarks) indicate the quality or the targets of a service that the local government aims to achieve and maintain, measured in terms of relevant indicators. The purpose of the SLBs is to establish a systematic basis to monitor and evaluate service delivery levels. In other words, SLBs are an important management tool to inform decision-making by the LGUs.

SLBs are measured by determining the performance indicators (effectiveness). Indicators are measurers of the degree of the fulfillment of the objectives, in other words, they are a quantitative expression of the criteria. They also serve as measurers of the standards set in advance or desired. They also can provide a good basis of comparison for the level of service provision among LGUs. This comparison can be used later to rank LGUs based on their performance.

The criteria are the developed rules for the assessment, or the basis of comparison between forms, or alternative mechanisms of a system's operation.

Methodology

Like in any sector, even in the waste management it is necessary to develop some indicators that enable the measurement of the performance of the service provided. These indicators should be defined, understood and accepted by all stakeholders, and be measured and reported periodically.

Measurement of the quality of waste management service delivery by the LGUs and private companies means not only measuring the results of this service, but indirectly it also reflects on the institutional capacities, financial performance and the management of their technical and human resources.

The parameters of the level of service delivery can be measured from the perspective of a manager or a planner, as well as from the perspective of a citizen or a client. However, to facilitate the comparison between the LGUs or different regions, or to identify changes in the performance of service delivery in time, it is necessary to monitor performance levels against some clearly determined (defined) and widely accepted indicators, compared, and what is even more important to be institutionalized over time.

In this context, the dldp program has taken the initiative to create a system of benchmarks to measure the performance of services in the urban waste sector relying on the long experience, of several years, of its activity in some regions of the country.

The process of drafting the benchmark system is based on an approach with the participation of stakeholders (representatives from line ministries, LGUs, "service providers", representatives from civil society and national and international experts). It is based entirely

on the current state of the service level offered today in the LGU and it is led by the principles and policies designed at national level.

The methodology followed to design a benchmark system is divided into four main stages as shown in the following figure:

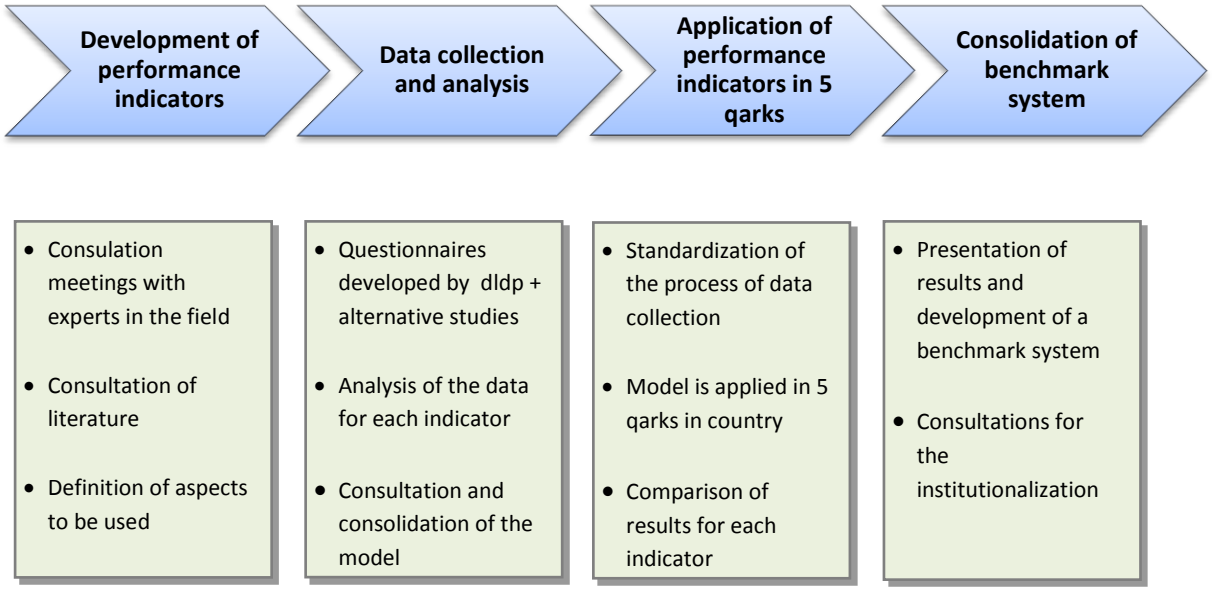


Figure 1. Methodology of designing a benchmark system for the SWM

Originally it was defined the purpose and the objectives to be met by the implementation of the benchmark system in the SWM sector. Some of the major reasons for designing a benchmarks system are summarized as below:

- to make it possible for each LGU to judge its performance in SWM service delivery;
- to provide the necessary information for decision-making authorities on priorities for improving the SWM service in the current conditions with limited funds available;
- to enable the identification of strengths (local circumstances) on the basis of which it can be built further and identify the weaknesses that need to be handled with care;
- to monitor changes in the quality of SWM service over time

Another important point at this stage is to determine the various aspects of SWM service, which later will be subject to evaluation through indicators. Definition of the aspects to be evaluated is realized through consultations with the Water Regulatory Authority, which has a five-year experience in monitoring and reporting the performance of water supply and sewerage companies. Furthermore a very important role in their definition has played the long experience of the dldp work mainly in five qarks in country and the current state of service delivery level in these qarks. Eventually the aspects of SWM service offered in each LGU to be evaluated are summarized as follows:

- Existing infrastructure
- Quality of service
- Financial sustainability
- Environmental sustainability
- Institutional aspects

This stage ends with the development of performance indicators, which will be used to monitor the abovementioned aspects of SWM service. Their design is based on: (i) extensive consultation with literature; (Ii) national experience of similar sectors, and (iii) in consultation with national and international experts.

The indicators' developing process, to assess the SWM service aspects, resulted in a synthesis between the observation goal we want to achieve and data that are available. So, the long list of desirable indicators, which was originally drafted, was reduced to a more concise list of indicators, which in practice it is probably more possible to measure and to use. The diagram below summarizes the concept of developing the indicators:

Figure 2.Design of performance indicators

The development of indicators to measure the service performance was followed by a series of consultative meetings with the stakeholders in the field of SWM. The aim of these meetings was to ensure that the indicators are well defined, understood and accepted by all stakeholders, are easily measurable (relying on the existing data) and are reportable.

The data needed to calculate the indicators are summarized in the form of a questionnaire and are distributed in some LGUs, in five qarks of the country. In total, 15 questionnaires were collected, which have been subject of a detailed analysis to ensure that the data is complete. To complete the created database other sources of information were also used, such as regional plans of waste management or local management plans.

It was observed, from the analysis of preliminary data, that the reliability of the data or their quality affects the measurement of the indicators and later the determination of the wanted level of service quality. Therefore this methodology proposes a classification of data as follows:

- data with a low level of trust,
- data with a moderate level of trust,
- data with a high level of trust (desired).

For each indicator, depending on the level of trust, are also given the methods of measurement and data collection. The process of data maintenance and their reporting is a culture absent in the LGU and as such it represents a series of difficulties, which can impact the monitoring process in the future. However, the methodology aims at the end, along with quality of service standards, to develop a standard form with relevant explanations to ease the process of data collection.

However the preliminary results and performance indicators will be presented before the group of local experts (representatives from five qarks where the standards will be tested) to ensure consistency in the methodology used to collect data from all units and to ensure that the process is understood and accepted by all.

At this stage, the methodology provides for a workshop with all "service providers", which will be another moment of consultation to explain in detail the methodology used. The purpose of this workshop is to consolidate the model and explain it to all the "service providers", who are expected to implement it in cooperation with the experts of LGUs in the areas where they operate (5 qarks in the study).

Eventually, after these indicators are tested and after we have a set of adopted standards or widely accepted ones, it is necessary to spread the created experience in these five qarks (fourth phase consolidation). LGUs throughout the country should be given enough time to test and validate these standards, to achieve later an acceptable level of them. The main objective remains that the LGUs may have the opportunity to meet these standards and not to have unrealistic standards.

Definition of service quality standards of the SWM

The following table gives a summary of the proposed standards to evaluate the performance of the physical components of the SWM system and its governance aspects. Meanwhile in Annex 1, it is presented a summary of the definition for each indicator, the method of its calculation, the description of the methods of data collection and classification of their reliability.

This methodology proposes the use of 10 qualitative and quantitative indicators, which measure the performance of service quality, environmental and economic sustainability, and its institutional and governance aspects.

Quantitative indicators are used to complement the quality indicators and to give them a sense more than just a numerical percentage. For example, if the rate of coverage of waste collection and transportation service in an LGU is 95%, this does not mean that this service necessarily has the best quality of service provided in the area where the LGU is located. So where it has been possible any quantitative indicator is complemented by a qualitative indicator consisting of several evaluation criteria (see Annex 1).

After being evaluated each quantitative indicator is categorized further into a system divided in five degrees, coded by color. This division allows for an easier visual comparison between

the LGUs, and orients the moving direction of the quality of service for each LGU. It is important to note that the importance of each quantitative indicator is different and it varies depending on the values that are considered as the best practices in the literature, in the ground, and depending on the real local conditions and on the national policies adopted. So for example, if the degree of coverage for the service of collection and transportation of waste is 60%, and this value is considered moderately low, we cannot say the same for a degree of 30% of differentiated waste collection, which is considered the highest degree of achieving this objective.

Evaluation of quantitative indicators is done as shown in Annex 1 with a scoring system from 0 to 20. Each evaluation criterion, which is part of a quality indicator, can be estimated with 0, 5, 10, 15 or 20 points. In the end, all the scores for each criterion are totaled and the qualitative indicator is converted into a percentage being classified same as the quantitative indicators. For the qualitative indicators the specific weight of each evaluation criterion is the same.

Table 1.Coded classifications in colors for the performance measurement indicators

		Classification coded in colors				
		Low	Moderately low	Medium	Moderately high	High
Indicators of the quality of service	**C1** Efficiency of waste collection	0 – 49 %	50 – 69 %	70 – 89%	90 – 98%	99 – 100%
	C2 Effectiveness of waste collection and streets cleaning	0 – 20 %	21 – 40 %	41 – 60%	61 –80%	81 – 100%
	C3 Efficiency in addressing the complaints of the clients	0 – 40 %	41 – 50 %	51 – 70%	71 – 90%	91 – 100%
Indicators of environmental sustainability	**D1** Degree of differentiated collection of waste	0 – 5%	6 – 10%	11 – 20%	21 – 30%	> 30%
	D2 Degree of waste treatment in compliance with the legislation	0 – 49%	50 – 74%	75 – 84%	85 – 94%	95 – 100%
	D3 Degree of environmental protection in treating and depositing the waste	0 – 20 %	21 – 40 %	41 – 60%	61 –80%	81 – 100%
Indicators of economic and financial sustainability	**E1** Degree of cost recovery	0 – 30%	31 – 50%	51 – 65%	66 – 85%	86 – 100%
	E2 Efficiency in tariffs collection	0 – 30%	31 – 50%	51 – 65%	66 – 85%	86 – 100%
Indicators of institutional aspects	**F1** Assessment of suitability of national policies of SWM including implementation	0 – 20 %	21 – 40 %	41 – 60%	61 –80%	81 – 100%
	F2 Degree of the coherence of local institutions	0 – 20 %	21 – 40 %	41 – 60%	61 –80%	81 – 100%

Annex 1. Definition of performance indicators

To make possible a division and a classified comparison of the service offered today by the LGUs it is necessary to classify all data according to the criteria outlined in the following table:

A. General information:

Table 2: General data for the LGUs

No	Name	Comments	Source of information
A1	LGU	Initially the LGUs should be classified according to the form of offering the service in the LGU that: ○ offer the service themselves ○ contract the service ○ offer the service jointly	Questionnaire
A2	Population	Another criterion of the LGU classification is the number of population, which also reflects the economic level of each LGU.	Data of the number of population according to the census in 2011
A3	Average quantity of waste	The average quantity of waste produced in a year is another indicator, which may classify the LGUs. More specifically the LGUs may be classified based on the average quantity of waste produced in a year from one inhabitant.	○ Questionnaire ○ Strategy and National Plan
A4	Composition of waste	Again another basic indicator is the type of waste. Here it is important to identify: ○ Composition of waste according to three main streams (% of bio-organics, % of cartoon/paper, % of plastic); ○ calorific value of waste; ○ moisture content; ○ density of waste.	○ Questionnaire ○ Strategy and National Plan

According to data collected by the LGU, all indicators above are measurable with the exception of some elements of indicator A4 (calorific value, moisture content and density, which need specific studies).

B. Assessment of existing infrastructure

Table3: Indicators of existing infrastructure

No	Name	Method of calculation	Comments
B1	Distribution of containers	$B1 = \frac{\text{No of containers}}{\text{km}^2}$	Data of the questionnaires of the

			Census for 2011
B2	No of residents that are served one container for the mixed collection of waste	$B2 = \frac{\text{No of residents}}{\text{No of mix containers}}$	Data of the questionnaires
B3	No of residents that are served one container for the differentiated collection of waste	$B3.1 = \frac{\text{No of residents}}{\text{No of containers RTH}^1}$ $B3.2 = \frac{\text{No of inhabitants}}{\text{No of containers BO}^2}$	Data of the questionnaires
B4	No of residents that are served from one vehicle of waste collection and transport	$B4 = \frac{\text{No of residents}}{\text{No of vehicles}}$	Data of the questionnaires
B5	Capacity of temporary collection of waste.	$B5 = \frac{\text{No of containers} \times \text{Vell.}}{\text{No of residents}}$	Data of the questionnaires

C. Indicators of the quality of service

Table4: Indicators of the quality of service

No	Name	Method of calculation	Comments
C1	Efficiency in waste collection	$C1 = \frac{\text{Quantity of collected waste } (\frac{\text{ton}}{\text{year}})}{\text{Quantity of produced waste } (\frac{\text{ton}}{\text{year}})} \times 100$	Data based on table 5.
C2	Effectiveness of waste collection and streets wiping	C2.1 Presence of waste accumulated around the container / PGM C2.2 Presence of waste in the main streets of the town and in the most populated areas C2.3 Presence of accumulated waste / illegal dumping/burning of the garbage in the suburbs C2.4 Fair application of control and supervision C2.5 Use of personal protective equipment and application of protocols	Data based on table 6
C3	Efficiency in addressing the complaints of the clients	$C3 = \frac{No\ of\ addressed\ complaints\ (24\ \text{h})}{No\ of\ complaints\ (24h)} \times 100$	Data based on table 7

C1 indicator expresses the amount of waste collected in the LGU, by the authorities authorized to carry out this service, versus the total amount of waste produced in the LGU.

This indicator is easy to measure and it is widely suggested by the literature to be used in measuring the efficiency of waste collection. However the reliance on this indicator varies significantly depending on the methods used to generate the data:

[1] RTH – stream of dry recyclable waste
[2] BO – stream of bio-organic waste

Table 5. Level of the reliability of the data and description of the measurement methods for indicator C1.

Degree of reliability	Description of the measurement methods
Low level (C)	• Waste generation is estimated on the basis of empirical data suggested, depending on the size of the city, in PKMM. • The amount of waste collected is estimated the number of trips made and the tonnage of collection vehicles toward the dumpsite.
Moderate level (B)	• Waste generation is estimated on the basis of empirical data suggested, depending on the size of the city, in PKMM. • The amount of waste collected is assessed on their measurement on the scales located at the entrance of the deposit.
High and preferred level (A)	• Waste generation is assessed on waste sampling (samples are statistically representative) in every season of the year for each category that receives the service (at least 1 time in 3 years) • The amount of collected waste is assessed on their measurement on the scales located in each treatment plants (composting, recycling and dumpsite / landfill)

Indicator C2, the effectiveness of waste collection and wiping of the streets, is a compound qualitative indicator, which is detailed by 5 components / evaluation criteria. The description of each criterion and its method of calculation are given in Table 6.

Table 6. Description and criteria used to measure qualitative indicator C2

No	Criteria	Description	Comments
C2.1	Effectiveness of waste collection	Presence of accumulated waste around the containers /PGM	This criterion focuses only on those locations of the LGU where it is provided the waste collection service. The presence of accumulated waste is estimated with scores as follows: ○ Very high presence of waste 0 scores ○ High presence of waste 5 ○ Moderate presence of waste 10 ○ Low presence of waste 15 ○ Very low presence of waste 20
C2.2	Effectiveness of streets cleaning	Presence of waste in the road.	This criterion focuses only on the main roads of the town and in the most populated areas. Scoring is the same as C2.1
C2.3	Effectiveness of collection in areas with low incomes	Presence of waste accumulated / illegal dumpsites / burning of the waste	This criterion focuses on the presence of illegal accumulation of waste and their burning in the open, which occur through the suburbs / rural areas (usually as a result of irregular waste collection). Scoring is the same as C2.1
C2.4	Effectivene	Fair application of	This criterion identifies if: (i) there exist appropriate

	ss of supervision and control	control and supervision	contracts (when the service is not contracted, the existence of service planning), (ii) there are detailed specifications for the service, (iii) there are monitoring procedures and (iv) if there are regular evidences on the supervision. This criterion is evaluated by the following points: ○ There is no compliance 0 points ○ Low compliance 5 ○ Moderate compliance 10 ○ Moderately high compliance 15 ○ High compliance 20
C2.5	Work safety conditions	Use of PPE and implementation of protocols	The application requirements of this criterion are: the use of boots, gloves, masks, vests and phosphorescent clothing, vaccination and periodic medical checks. These criteria are required both: when the service is contracted or when provided by the LGU. Scoring is the same as C2.4

Indicator C3, efficiency in addressing the customers' complaints, expresses the number of complaints addressed regarding SWM in relation to those obtained in the same period (usually one month).

Table7. Level of reliability of the data and description of the measurement methods for indicator C3.

Degree of reliability	Description of measurement methods
Low level (C)	• There isn't any database for registering the complaints. These data are provided on the basis of individual memory of the persons charged with this task.
Moderate level (B)	• There are various methods to collect complaints, e.g. by phone, e-mail, etc. However there isn't a system in place to make their categorization and grouping according to the results. The data collected for several months are used as a trend to generate annual data.
High and preferred level (A)	• There is a database which is maintained and regularly filled every day, where all complaints are recorded and classified according to their nature and addressing.

D. Indicators of environmental sustainability

Table 8. Indicators of environmental sustainability

No	Name	Method of calculation	Comments
D1	Degree of differentiated collection of waste	$D1 = \frac{Qty\ of\ waste\ collected\ separately}{Qty\ of\ waste\ collected} \times 100$	Data according to table 9.
D2	Degree of waste treatment in compliance to	$D2 = \frac{Qty\ of\ waste\ treated\ based\ on\ legislation}{Qty\ of\ collected\ waste} \times 100$	Data according to table 10

	the legislation			
D3	Degree of environmental protection in treating and depositing the waste	D3.1	Efficiency of control during the acceptance of waste	Data according to table 11
		D3.2	Efficiency of control on the treatment of waste	
		D3.3	Degree of monitoring and of environmental control verification	
		D3.4	An assessment of the level and of the adaptation of the management control in planning, implementation and monitoring	
		D3.5	Use of personal protective equipment and implementation of protocols	

Indicator D1, Degree of segregated waste collection - expresses the amount of waste collected segregated by the LGU authorities authorized to carry out this service. The separation/segregation of waste at source must be at least at the level of "dry recyclable waste", "bio-degradable waste" and "other streams".

It is important to calculate this indicator based on the amount of waste collected separately which arrive separately at the treatment centers (plants) and not on the amount of waste collected separately in collection points. If it is possible, and if there is information on the amount of waste collected by the informal sector in different points of the system, then it is needed to add to the amount of waste which arrive segregated in the treatment plants the amount of segregated waste collected by the informal sector. Table 9 gives the degree of reliability of this indicator depending on the methods used to generate the data.

Table 9 Level of reliability of the data and description of the measurement methods for indicator D1.

Level of reliability	Description of measurement methods
Low level (C)	• Segregated waste collection is estimated by the service provider without any accompanying documentation and ungrounded in any measurement methodology. • % of service recipients who are equipped with the relevant infrastructure (system with two or three bins) is used as a basis to estimate the amount of segregated waste collection.
Moderate level (B)	• Assessment of the collected amount is based on the data collected by the authorities involved in the segregated collection (collection points of different streams) accompanied by appropriate documentation.
High and preferred level (A)	• The amount of waste per day reaching the treatment plants which is measured with scales based on the weight of each car for every trip. • To this amount should be added the quantity of waste drawn by collection system of the informal sector.

To enable a comparison between different LGUs, this indicator can also be expressed as a ratio of segregated waste collection against the number of the population that receives the service.

$$D1_{Alternativ} = \frac{\text{Quantity of segregated waste collection } (\frac{\text{ton}}{\text{months}})}{\text{Total number of residents(residents)}}$$

To enable the identification of the importance of the role of the infrastructure in the success of segregated waste collection this indicator can be calculated as below:

$$D1_{Alternativ} = \frac{\text{Total number of PG in a segregated manner}}{\text{Total number of residents (residents)}}$$

Indicator D2, Degree of waste treatment in accordance with the legislation – expresses the amount of waste treated in the landfill, incinerator, composting or recycling plant, which are designed, constructed and operated and maintained in accordance with the standards approved by central level institutions.

The degree of reliability of this indicator, depending on the methods used to generate the data is given in the table below.

Table10. The level of reliability of the data and the description of measurement methods for indicator D2.

Degree of reliability	Description of measurement methods
Low level (C)	• In the waste treatment facility there are no records and documents on maintenance and operations. • The data are given either based on the number of vehicles or trips to the plant, or based on mass balance (total waste collected - loss of moisture - the recycled or composted amount).
Moderate level (B)	• In waste treatment sites there are records of the treated quantities. However, the data and the procedures on the operation and maintenance operations are missing.
High and preferred level (A)	• In the waste treatment sites are found the data of the treated quantities, which are collected regularly. The operating practices and routine procedures in case of accidents are in place and maintained. In such cases, the data are recorded.

Indicator D3 is a qualitative indicator, which expresses the degree of environmental protection in waste treatment and disposal. It is detailed in 5 components/evaluation criteria. The description of each criterion and its method of calculation are given in Table 11.

Table11. Description and criteria used to measure the quality indicator D3

No	Criteria	Description	Comments
D3.1	Efficiency of control during the acceptance of waste at the plant	Control degree in accepting waste in any treatment plant	Factors that influence the assessment of this criterion are as follows: a) Control access on transport vehicles. b) The level of control and security at the plant (no unauthorized entry, the doors are kept closed). c) The existence of the reception office, the presence of staff during working hours, and the vehicles are checked, registered and weighed. d) Discharge of waste under strict control (waste are discharged into an area designed for this purpose

			under the supervision of staff). e) High level of control over the spread of waste by the wind, spread of flies and parasites or mud from the car's movement. f) Control of the fires (there are no routine burning of waste, the procedures for fire prevention and extinguishing in case of emergency or accident are in place and applied. This criterion is scored as below: ○ There is no control 0 points ○ Low control 5 ○ Moderate control 10 ○ Moderately high control 15 ○ High control 20
D3.2	Efficiency of control over the treatment of waste	This criterion covers the presence of the necessary infrastructure and procedures of its proper use	Assessment of this criterion is as follows: ○ Uncontrolled landfill **0 points** ○ Semi-controlled landfill (existence of the staff, the waste is dumped in a designated area, existence of some equipment) **5 points** ○ A landfill with an average control (the waste is compacted using technological equipment and are covered (at lease not regularly) **10 points** ○ Engineering landfill (the waste are covered daily, an acceptable level of the treatment of leachate and control on the landfill gas) **15 points** ○ Engineering landfill completely operational (designed and position properly, complete collection and treatment of leachate and gas, final closure and monitoring plan after closure is in place) **20 points**
D3.3	Degree of monitoring and verification of environmental control	This indicator includes: the presence of environmental permits, licensing procedures, record keeping, monitoring and verification performed at the plant by its staff and independent authorities.	The plant should be in accordance with the national environmental legislation and subject to the EIA procedures. - environmental permit The plant should have records of waste volume, weight and category (at least occasional monitoring of the composition of the waste and their other properties), control of odors, pests, fires, potential GHG emissions as follows: – There should be control over the surface waters and groundwater for the landfills – For sanitary landfills, leachate and gas management – For thermal treatment control on the humidity and waste calorific power, control over temperature, reception time and air emissions (NOx, SOx, HCl, dioxin, heavy metals, etc.), the existence of management methods for the soaring ash and the one remaining after treatment. – For the biological treatment, control on the waste to handle the processes and the product quality, control of the temperature, mixture and reception time, GHG emissions, mainly methane and oxides.

			This criterion is scored as below: ○ There is no compliance 0 points ○ Low compliance 5 ○ Moderate compliance 10 ○ Moderately high compliance 15 ○ High compliance 20
D3.4	Degree of technical knowledge in planning, management and operation	Assessment of the level of technical knowledge in three points of the system	The assessment is performed for: (i) authorities responsible for service delivery (ii) and management and plant operation staff and (iii) operating staff Factors that affect the assessment of this criterion are as follows: Training and level of the technical knowledge of the managers and persons or groups responsible for treatment operations, should comply with national objectives and approved by national authorities In addition: – When treatment and storage are performed by the private sector the contracts, detailed specifications of service operations, monitoring procedures, etc. should be identified. – When treatment and storage is provided by the public sector, the evidences of service planning, operation and public reaction should be identified. This criterion is scored as D3.3
D.3.5	Work safety conditions	Use of personal protective equipment and implementation of protocols	This criterion applies both to the public sector as well as to the private sector. Requirements include: safe and mandatory operating procedures, regular medical checkups and vaccinations, boots, gloves, protective caps, respiratory protective devices and high visibility clothing. This criterion is scored as D3.3

E. Indicators of economic and financial sustainability

Table 12. Indicators of economic and financial sustainability

No	Name	Calculation method	Comments
E1	Degree of cost recovery	$\text{E2} = \frac{\text{Annual income from WM } (\frac{\text{lek}}{\text{year}})}{\text{Annual operating cost } (\frac{\text{lek}}{\text{year}})} \times 100$	What is the degree of coverage of the WM operating cost from LGUs, from the income associated exclusively with WM. This indicator is defined as a percentage of the operating incomes in the WM system in relation to the operational cost of the system.
E2	Efficiency in tariff collection	$\text{E3} = \frac{\text{Annual income from WM } (\frac{\text{lek}}{\text{year}})}{\text{Total of planned incomes } (\frac{\text{lek}}{\text{year}})} \times 100$	In what degree the fee collection plan was achieved? This indicator

	is defined as a percentage of the ratio of collected revenues in the current year with the total of the revenues planned for this year.

Indicator E1, cost recovery rate - expresses the magnitude of WM operational costs coverage from the LGU, from the revenue associated exclusively with SWM. This indicator is defined as a percentage of the operational income in the SWM system in relation to the operational cost of the system.

The annual operating costs should include all operating expenses of the LGU to provide WM service. This should include costs associated with the costs of operation and maintenance, all administrative costs (salaries, insurances, contracts, different rents, etc.). Operating expenses also include payments to the contractors in cases where different services are contracted to a third party. Annual operating income include all taxes and fees from the WM system plus incomes from processing or recycling collected on the account of the LGU.

The degree of reliability of this indicator, depending on the methods used to generate the data given in the table below.

Table 13. Level of reliability of the data and description of measurement methods for indicator E1.

Level of reliability	Description of measurement methods
Low level (C)	There isn't a breakdown of the budget items related to waste management activities from other functions, e.g. roads wiping with the drainage systems maintenance. The budget is organized in such a way that it is very difficult to assess administrative and maintenance costs of the activities related to waste management. The announcement of the budget and reporting are never on time
Moderate level (B)	The main items of the budget in relation to waste management are separated. The main costs associated with WM activities are identifiable; however, a complete separation is not yet evident. Revenues and main expenses are identified on the basis of basic principles. The announcement of the budget is always on time. Accounts are finalized and closed even though auditing may still be pending.
High and preferred level (A)	Main budget items related to waste management are clearly separated and costs allocating standards for the main costs are in place. Accounting standards are comparable with commercial accounting standards, with clear instructions on the recognition of incomes and expenditures. Manuals of accounting and budgeting exist and are applied. The financial statements are fully transparent, closed and audited on time.

Indicator E2, efficiency in the collection of tariffs, expresses degree of realization of the tariffs collection plan. This indicator is defined as a percentage of the ratio of revenues collected in the current year with total revenues planned for this year.

It is not sufficient for an LGU to have a suitable structure of tariffs, which enable cost recovery, it is equally important at this point the efficiency in revenues collection. Also, it is important for the revenues to be collected in the same financial year avoiding thus the creation and accumulation of debts. Annual incomes from waste management include only the revenues collected for the bills submitted during the year in question. Debt collection from the previous years should be excluded from this income.

The degree of reliability of this indicator, depending on the methods used to generate the data is given in the table below.

Table 14. Level of reliability of the data and description of the measurement methods for indicator E2.

Level of reliability	Description of measurement methods
Low level (C)	• There isn't a division of the arrears (debts) with the incomes collected through the current year. The structure of accounting codes does not enable a clear division of the revenues.
Moderate level (B)	• There is a clear division of the incomes collected during the current year with the debts accumulated during the years. However the collected incomes do not reconcile with the invoices issued during that year. The general principles of accumulation in accounting have been considered and therefore the deposits and advances have not been included in the respective incomes and expenditures.
High and preferred level (A)	• Records of the collection of the fees are kept for each cycle of issuing the invoices. The collections of fees are identified against the specific invoices issued. • The structure of accounting codes allows for the monitoring of the issuing of the invoices and their collection for each area of the LGU.

Another simple indicator to be measured, and also very important, especially when we plan the SWM tariffs for all categories and more specifically for the family category is a specific cost of the SWM (ALL/ton, ALL/family)

$$Specific\ cost\ = \frac{total\ cost}{ton}\left[\frac{ALL}{ton}\right] ose = \frac{total\ cost}{family}\ [\frac{ALL}{family}]$$

F. Indicators of institutional – governing aspects

Table 15. Indicators of institutional aspects

No	Name	Calculation method	Comment
F1	Assessment of the suitability of the national	This criteria covers the basic legislation and the implementation of the regulations as follows::	This is a compound qualitative indicator and the focus is in the national

	policies of SWM including implementation	F1.1 Legislation and regulations F1.2 National Strategy of Waste / Policies F1.3 Guides and implementation procedures F1.4 Responsible institution for the implementation and coordination of SWM policies F1.5 Regulatory control and implementation F1.6 Extended responsibility of the producer	framework in which the LGUs need to develop their national plans. The data according to table 16
F2	Degree of the coherence of local institutions	F2.1 Organizational structure F2.2 Institutional capacities F2.3 Local SWM plan F2.4 Availability and quality of data for SWM F2.5 Control, management and service supervision F2.6 Intercommunal interaction	This is a compound qualitative indicator that measures the institutional power and the coherence of the local institutions in SWM with the central ones. Data according to table 17

Table 16. Description and criteria used to measure the qualitative indicator F1

No	Criteria	Description	Comments
F1.1	Legislation and regulations	Existence of the national legal framework for the SWM (bylaws)	Factors that influence in the assessment of this criteria are as follows: • Presence of the specific legislation in the SWM area • Presence of bylaws which are approved and implemented. (If a specific law is approved but it has never been implemented then the option receives minimum scores) This criteria is scored as follows: ○ There is no compliance 0 points ○ Low compliance 5 ○ Moderate compliance 10 ○ Moderately high compliance 15 ○ High compliance 20
F1.2	National strategy of waste / policies	Existence of an adopted strategy which is currently enforced	The national strategy of waste should have defined the real actions that should be undertaken in a certain time period to support the SWM legislation. The strategy should also define the targets to be achieved and the economic instruments that help to reach the objectives. The existence of a recently updated strategy takes more points. The criteria is assessed the same as F1.1.
F1.3	Guidelines and implementation procedures	Are there clear guidelines and regulations for the LGUs on how to implement the law and the strategy	– Guidelines need to define how in practical terms, the national legislation on the SWM and the strategy need to be implemented at national level. – Guidelines, among others, should define the requirements on the implementation and enforcement of a regional/local plan, which needs to include the basic mechanisms to

			increase the recycling rate and the planning of the required infrastructure. – This finally should be followed by the development of feasibility studies which make sure that the new plants are build in the most appropriate places by using the EIA analysis and the consultation with the public. This criteria is scored as F1.1
F1.4	Responsible institution to enforce and coordinate the SWM policies	Is there an institution at national level which is in charge of coordinating and implementing the SWM policies	The situations when the responsibilities are clearly defined in an entity which is equipped with the required resources and the qualified staff as well as in the situations when the functions between the compilation of policies and the regulation are separate receive high scores. This criteria is scored as below: – Institutional responsibilities for the implementation of the strategy are unclear or unspecified (0 points) – Some departments have a shared responsibility, but a staff with limited competencies (10 points) – Institutional mechanisms for the implementation of the strategy exist along with the participation of the relevant ministries / or the waste department is equipped with a qualified staff but within the environment regulatory sector (10 points) – It exists a single national entity equipped with a professional staff, but it operates within the national environmental regulatory system / or an entity that operates independently, but it doesn't have a qualified staff (15 points) – A single national entity, professional and with the staff needed which operates independently from the environmental regulatory system (20 points)
F1.5	Control and implementation	Existence of an organized regulatory agency and with the required resources to implement the legislation	Control and implementation of the legislation are functions that should be taken by an Environmental Regulatory Agency. The responsibilities related with the SWM should include the equipment with an environmental permit and the inspection of the landfills or treatment plants. In this assessment point it is not important how the Regulatory Agency is organized (at national level, regional or municipal), but the focus is if it operates in practice or not? This criteria is scored as F1.1
F1.6	Extended responsibility of the producer (ERP)	Are there agreements between the national companies or international companies which produce	ERP is necessary to be applied as a means to shift the financial 'burden' and the management of the recycling system to those businesses that manufacture products, which at the end of their life cycle result as the major part of the stream and of the general amount of the urban waste. Often these schemes are described in the national legislation, but also the voluntary schemes or local

	packaging, electronic devices, electrical devices that end up in SWM.		partnerships between large companies and informal organizations of the recycling sector are also possible. This criteria is scored the same as F1.1

Table 17. Description and the criteria used to measure the qualitative indicator F2

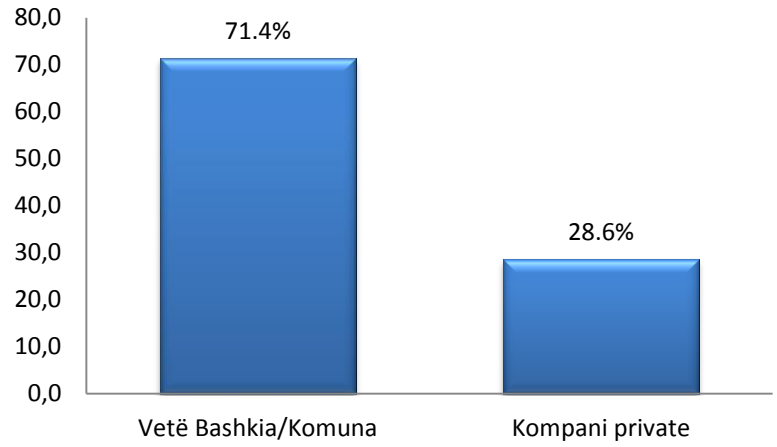
No	Criteria	Description	Comments
F2.1	Organizational structure	Degree of concentration of responsibilities for the SWM in a single department that may hold the responsibility for the performance	• Is there a department or a sector under the municipality/commune, which is responsible to plan the SWM, provide the service and finance it? • Is the entire waste management budget as a line item of the budget of this department? This criteria is scored as below: ○ There is no compliance 0 points ○ Low compliance 5 ○ Moderate compliance 10 ○ Moderately high compliance 15 ○ High compliance 20
F2.2	Institutional capacities	Assessment of strong points and of the capacities of the department in charge of SWM	Although the existence of a single department may receive high scores in the F2.1 criteria, the assessment of this criterion should be applied in all departments which may have at least some responsibility for the SWM. – Is there a detailed organogram for the SWM department, or for each responsible department? – Are all the key positions staffed and is the staff adequately qualified? – Is there a promotion or a career structure within the department? – Is the staff adequately trained both in theory and in practice? The criterion is scored the same as F2.1.
F2.3	Local SWM plan	Is there a SWM plan and is it under implementation ?	– The plan should comply with the national strategy implemented at local level – Is the compiled plan still valid? – Are there resources and funds to implement it? This criteria is scored as F2.1
F2.4	Availability and quality of the data for the SWM	Is there a system of information management	– The components of such as system should include regular measurements of the waste generation, waste composition, and collected amounts, recycled, treated and deposited. – Measurements based on the volume are unreliable and should receive lower scores as to when the waste are measured physically with the scales. – An important element here when we do the scoring is the latest update of the database. The more up to date it is, the more points it should

			receive. This criterion is scored as F2.1
F2.5	Control, management and supervision of the service	Measurement of control force in town	The service can be offered by the public, or by the private sector, or as a combination of both. In those areas of the town where the private sector provides the service it should be evaluated: • Are the collection, transport and treatment and disposal operations supervised by the municipality? • Is the supervision staff familiar with the technical specifications of the contracts and how should they be measured and implemented? • Has the monitoring staff access in suitable means of transport (motorbikes or cars) In those town areas where the public sector is offering the service it should be evaluated: • Is there a clear division between the roles of service offering and the implementation monitoring? • Are there documented evidences of the service monitoring procedures? • Does the monitoring staff have access in suitable means of transport (such as motorbikes or cars) This criterion is scored the same as F2.1
F2.6	Cross-municipal cooperation	Waste collection is often offered at local level whereas treatment or storage require a wider interaction at regional level	• Evidence of the good interaction relations and the clear definition of the roles and responsibilities between the different levels of responsible bodies for the SWM aspects including towns/regions or also at national level. • In particular important for the SWM policies, planning and service provision. • Cooperation at national or regional level of different departments may include budgeting, control and implementation, and the public communication as well. This criterion is scored the same as F2.1

Annex 2. Results of the questionnaires

A. General information:

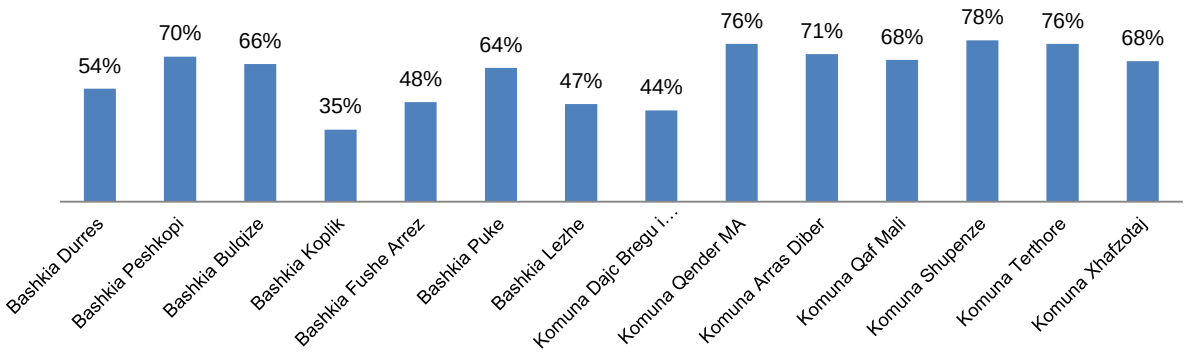
Form of offering the service



Population

	Population INSTAT	Population Civil registry	Difference	Qark
Durres Municipality	113,249	208,026	94,777	Durres
Peshkopi Municipality	13,251	18,950	5,699	Diber
Bulqiza Municipality	8,177	12,323	4,146	Diber
Koplik Municipality	3,734	10,746	7,012	Shkoder
Fushe Arrez Municipality	2,513	5,240	2,727	Shkoder
Puka Municipality	3,607	5,600	1,993	Shkoder
Lezha Municipality	15,510	33,000	17,490	Lezhe
Dajc Commune	3,885	8,854	4,969	Shkoder
Commune Center MA	4,740	6,229	1,489	Shkoder
Commune Arras Diber	3,055	4,300	1,245	Diber
Commune Qaf Mali	1,548	2,263	715	Shkoder
Commune Shupenze	5,503	7,084	1,581	Diber
Commune Terthore	2,959	3,890	931	Kukes
Commune Xhafzotaj	12,381	18,278	5,897	Durres

In the chart are given the data according to INSTAT 2011 and what the LGUs report in the questionnaires, whereas the difference in the percentage is presented in the chart below;



Average quantity of waste production

	Population INSTAT	Kg/resident /day SKM	Ton/Year
Municipality Durres	113,249	1,1	45,469
Municipality Peshkopi	13,251	0.7	3,386
Municipality Bulqize	8,177	0.7	2,089
Municipality Koplik	3,734	0.7	954
Municipality Fushe Arrez	2,513	0.7	642
Municipality Puke	3,607	0.7	922
Municipality Lezhe	15,510	0.7	3,963
Commune Dajc	3,885	0.4	567
Commune Qender MA	4,740	0.4	692
Commune Arras Diber	3,055	0.4	446
Commune Qaf Mali	1,548	0.4	226
Commune Shupenze	5,503	0.4	803
Commune Terthore	2,959	0.4	432
Commune Xhafzotaj	12,381	0.4	1,808

All the LGUs accept in a survey the fact that waste generation is estimated approximately. An exemption are only Dajc commune, which weighs the waste, and Lezha municipality which claims that during 2013 a survey was conducted and some measurements of the generation rate were done. Whereas some other LGUs such as Koplik municipality or Arras Diber commune use the coefficient on the generation rate, but that are different from those suggested by the SKM.

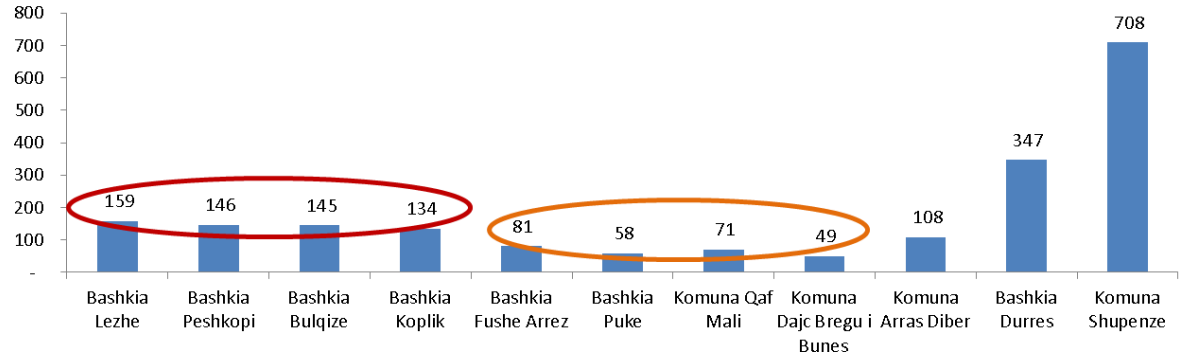
B. Infrastructure assessment

B2. No of residents that is served by one container for the mixed collection of waste

	Population	No of containers	No of residents that are served by one container
Municipality Durres	113,249	600	189
Municipality Peshkopi	13,251	130	102
Municipality Bulqize	8,177	85	96
Municipality Koplik	3,734	80	47
Municipality Fushe Arrez	2,513	65	39
Municipality Puke	3,607	96	38
Municipality Lezhe	15,510	208	75
Commune Dajc	3,885	180	22
Commune Qender MA	4,740	-	-
Commune Arras Diber	3,055	40	76
Commune Qaf Mali	1,548	32	48
Commune Shupenze	5,503	10	550

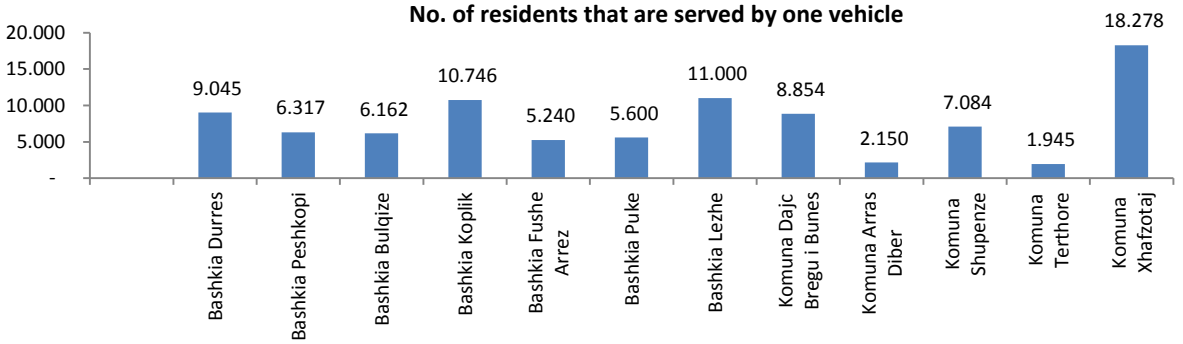
Commune Terthore	2,959	-	-
Commune Xhafzotaj	12,381	-	-

No of residents that are served by one container



B4. No of residents that are served by one waste collection and transportation vehicle

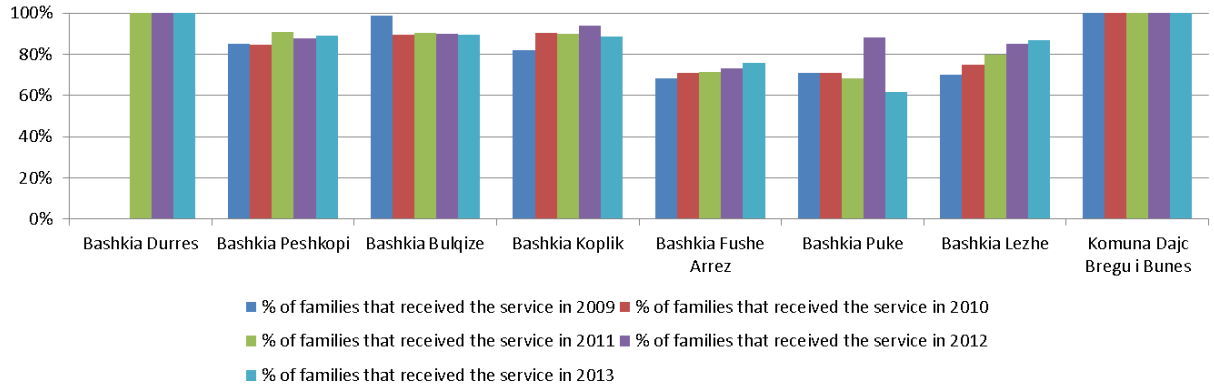
	Population	No of vehicles	No. of residents that are served by one vehicle
Municipality Durres	113,249	23	4,924
Municipality Peshkopi	13,251	3	4,417
Municipality Bulqize	8,177	2	4,089
Municipality Koplik	3,734	1	3,734
Municipality Fushe Arrez	2,513	1	2,513
Municipality Puke	3,607	1	3,607
Municipality Lezhe	15,510	3	5,170
Commune Dajc	3,885	1	3,885
Commune Qender MA	4,740	-	-
Commune Arras Diber	3,055	2	1,528
Commune Qaf Mali	1,548	-	-
Commune Shupenze	5,503	1	5,503
Commune Terthore	2,959	2	1,480
Commune Xhafzotaj	12,381	1	12,381



C. Indicators of the quality of service

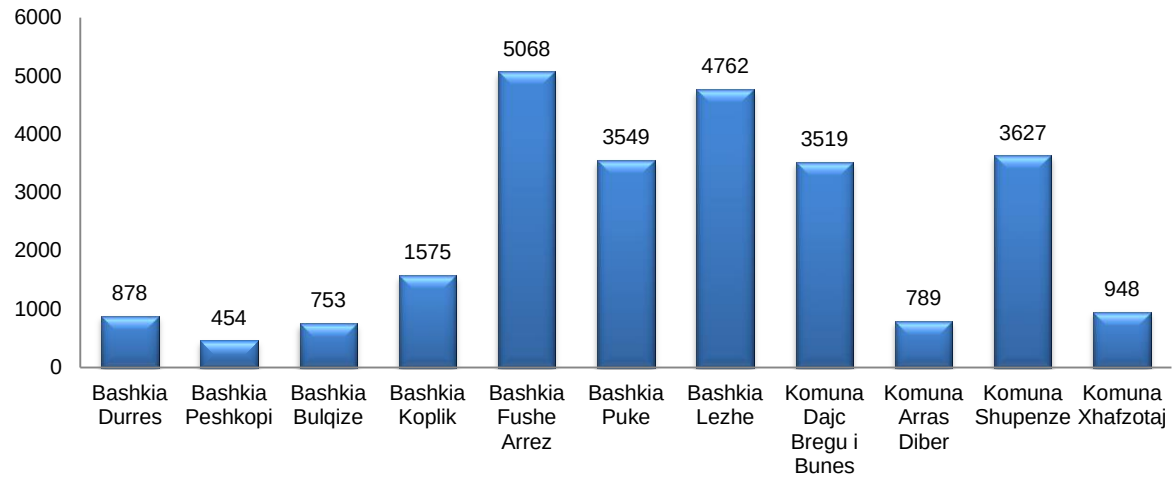
Effectivnes of waste collections

$$C1 = \frac{\%\ of\ families\ that\ received\ the\ service}{Total\ number\ of\ families}$$

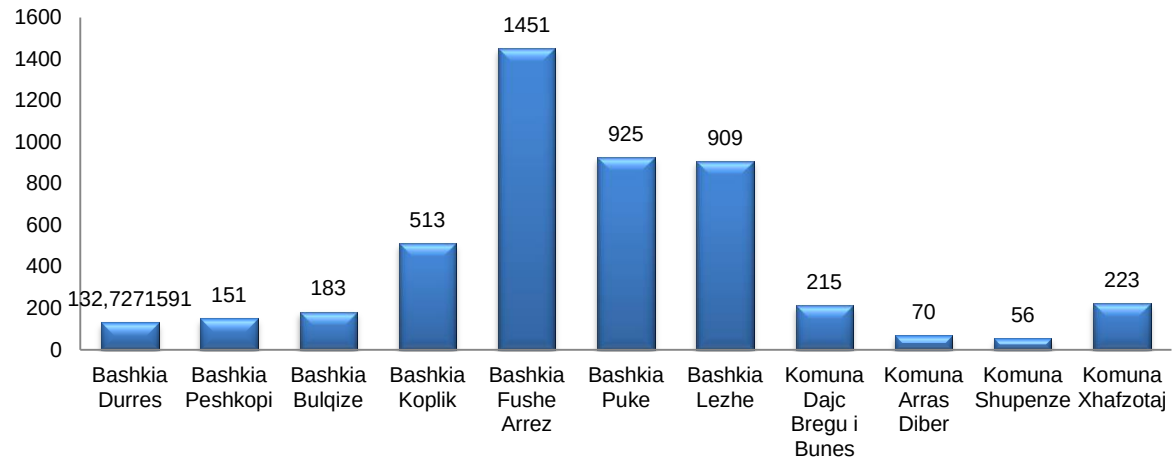


D. Indicators of economic and financial sustainability

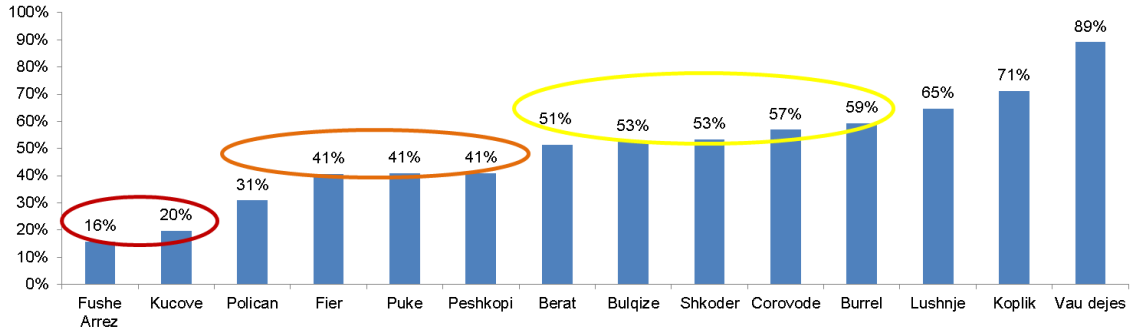
Total cost for 1 tons of waste



Total cost for residents (data according to the questionnaires)



Cost recovery (data according to regional plans of Shkoder, Diber, Fier and Berat)



Efficiency in tariff collection (data according to questionnaires)