**Best case study- Module 1**

**Commune of Dajç /Co-PLAN/** **Helvetas Swiss Intercooperation Albania**

**“Reducing the cost of waste collection service in Municipality Dajç"**

1. **Introduction**

This case study has been developed by the experts of the Municipality Dajç with the technical support of Co-PLAN, Institute for Habitat Development and HELVETAS-Swiss Inter-cooperation Albania, in the framework of waste management components of dldp program for 2013.

The case study is the result of work done by the local experts of Commune of Dajç in the frame of the implementation of the activities and support provided under Module 1, focusing on improving the performance of urban waste collection service, in terms of quality, effectiveness and efficiency of waste collection services.

Since 2009, the Commune of Dajç has adopted its local urban waste management plan and has introduced[[1]](#footnote-1) and continually has improved its waste collection scheme in the entire territory of the local unit. However, the commune is committed to further improve the current performance of the waste collection service, to provide a more qualitative, effective and efficient service.

In this context, through the development of this case study, the commune aims to identify the problems and barriers that hamper current waste services, to find out potential ways for reducing the cost of service, possibly pursuing with the execution of corrective measures and remedial actions, and finally the evaluation of improved results. More specifically, the intention is to reduce the cost of service and/or improve the quality of waste collection service; to reduce the time of collection and transportation of waste from the labor brigades; to improve container distribution network, routes for collecting waste, frequency of service; to enable better utilization of waste trucks and containers, avoidance and minimization of the obstacles that delay the operations and increase service costs; by improving maintenance and repair procedures for equipment and trucks etc.

1. **The process, description of the main steps**

Following the models and materials provided under the Module 1, Commune of Dajç developed this case study in accordance with local conditions, the current service provision, considering local needs, priorities and requirements of local waste management plan. The case study development process went through the following steps:

1. The assessment of current performance of waste collection service, through the development of a questionnaire, interviews, testing and evaluation of services based on performance indicators.
2. The identification of problems and barriers that directly or indirectly affect the performance of the service, determination of measures or actions, necessary corrections to improve service, establish and improve standards of procedures/practices, etc.
3. The official approval and implementation of the measures and improvement of the procedures.
4. Testing, comparison and evaluation of outcomes and improved results in service performance.
5. **Assessment of the current situation**

Assessment of the existing situation comprised the evaluation of the current performance of urban waste collection service in terms of the quality, effectiveness and efficiency, identification of problems and obstacles that lead to the reduction in quality, delays in operation, as well as increase of the cost of service. The following issues are of major importance for the organization of waste collection services and for its performance:

**3.1 Availability and accuracy of the local data**   
Having accurate data on the quantities of waste generated within local territory constitute a crucial element for planning of proper waste collection service including its components, such as the number and capacity of containers needed, collection frequency, the number of collection routes, the use of technological truck, etc. In fact, the Commune of Dajç has previously solved this problem by taking accurate information on waste generated and collected within its territory, according to the adequate measurements and frequent reporting by the authorities that manage the landfill of Bushat. According to these data, it results that the amount of urban waste generated within the Commune of Dajc appears about 37%[[2]](#footnote-2) lower than the amount of waste foreseen in the frame of the local waste management plan. It is believed that this difference is mainly related to incorrect data about the level of residency of inhabitants in the commune, as well as due to the a lower per capita waste generation rate in comparison with the recommended national standards[[3]](#footnote-3). In fact, thanks to the *door-to-door* survey performed ​​ in 2012, now the local authorities possesses accurate and detailed information regarding permanent and temporary residents for each village.

**3.2 Measurement and assessment of the waste collection time**

The assessment of the effectiveness of waste collection system was made possible through direct measurement of the time of collection of waste from the starting point (first waste collection point (WCP) to the end point (last WCP), pursuing with measurement of the time of transport to the landfill and return to the auto-park or to the next collection route. The measurement survey was performed for four waste collection routes[[4]](#footnote-4) for two consecutive weeks, respectively for two sessions, (before and after the correction measures being implemented). In addition, the survey considered the level of filling of containers before waste is collected and the weight of the truck for a complete collection route.

In fact, the comparison of the average time for operating in a WCP[[5]](#footnote-5) (6min/WCP) with the time empirically calculated (4min/WCP), based on the characteristics of the existing WCP network[[6]](#footnote-6), presents the potential to improve the waste collection system, in term of reducing the time of service. After the changes and corrections made ​​in the organization of waste collection routes, the overall waste collection system[[7]](#footnote-7) efficiency is increased by 20% (the waste collection time is reduced from 14 hours/week at 9.45 hours/week). Consequently, it is expected that the communes will spend 20% less fuel and lubricant, only by reducing waste collection time by 20%.

**3.3 Infrastructure for collection and transport of waste**  
Waste collection and transportation infrastructure, technical condition and their effective use are important elements that directly affect the effectiveness, quality and efficiency of waste collection service and its cost. Testing and evaluation of the performance of the service, revealed a number of problems and issues that require more attention and intervention by the authorities.

1. **Distribution of the containers**

The current distribution of WCPs and containers is based on pre-planned scheme determined in the local waste management plan, upon which the local authorities have made adequate changes according to the local needs of the community and businesses. Moreover, in response to the several requests from the consumers, in some cases the containers are located in inappropriate places, affecting the frequent damage of the containers and effectiveness of the entire waste collection service.

Normally, there is a wide distributed network of WCPs, directly linked to the urban expansion of the villages and urban settlements. The average distance between the consecutive WCP-s appears to be effective, at a level of 620 linear meters, and a distribution of the containers at a rate of 1.14 containers /WCP. But at the same time, certain WCPs are very close to each other, especially within route 2 (Dajc-Samrisht) and route 3 (Pentar-Belaj Rrushkull), where distances between WCPs varies between 40-60 linear meters. This means that there are a lot of *Stop &Go* cycles that affect directly increase the service time and therefore its cost.

1. **Effective and efficient use of the waste containers and WCPs**

The use of the waste trucks and containers are key elements for the effectiveness and efficiency of the waste collection services and consequently for the cost of the services. Based on the results of testing and evaluation of the waste collection system in the Commune of Dajç, it is revealed that the use of containers (in view of the volume) is satisfactory at the level of 74% of its capacity, which in a way means that the commune has planned and use adequate number of containers. However, 32% of the containers are overflowing before emptying them and 27% of them are filled below a certain rate (e.g. < 50% of their capacity). This means that 32% of containers are overfilled or there are wastes on the pavement, which takes more time to collect waste and delay the service and reduce the level of its efficiency, as soon as it takes more time[[8]](#footnote-8), hence reducing the waste collection efficiency. In addition, in 27% of the cases, there are more containers in the WCPs, which mean additional time and costs for collection the waste.

Although the level of effectiveness of the waste collection system is affected by certain factors or circumstances, for e.g. the nonlinear distribution of the households/dwellings or the need for individual waste collection for some consumers, still the local authority should evaluate the possibility to redistribute the existing containers according to the real needs. If this measure is not effective, the local authorities should add more containers in all problematic WCPs. These measures will enable the reduction of waste collection time and raise the quality of the service.

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The technical condition of the containers is another element that directly affects the quality of service provision and the efficiency of the use of containers. The use of damaged containers delays the operation time and increases the operation costs.

The high number of damaged containers in the Commune of Dajç (about 20% of the containers are damaged while 7% are out of service), is primarily caused due to the lack of maintenance and repair services, as well as because of the inappropriate terrain where some of the containers are placed. The lack of maintenance and repair service for containers has come as the local authorities have failed to allocate sufficient funds for this purpose and as they lack experience and knowledge about the issue. This problem leads to additional capital investment requirements for premature replacement of the containers.[[9]](#footnote-9)

1. **Effective and appropriate use of the waste truck**

For the collection and transportation of urban waste the commune owns and uses a technological truck, with a loading capacity of 5ton. The waste truck collects urban waste throughout the entire WCPs network through four collection routes/a week. The level of use of the truck is low, about 28% of its maximum availability (two shifts a day for 7 days a week), which means that the truck can be used for additional 72% of the available time. Inter-municipal cooperation with other neighboring local government units is deemed necessary to increase the accessibility of technological truck and reducing service costs.

Meanwhile, the truck is used below their optimal capacity, the waste collection routes are fragmented and the truck is not completely loaded at the end of the collection routes, (approximately 66% of its capacity). This means that there is an unused loading capacity for each collection route and tangible potential for improvement of the effectiveness of the services.

In this context, to better utilize the capacity of the truck, the commune intervened in the re-organization of collection routes, shifting from a scheme with 4 collection routes to a new scheme with only 3 collection routes a week. This adoption of the new collection route system brought a reduction of the waste collection time from 14 hours/week to 9.45 hours/week and a reduction of the transport time from 8 hours to 6 hours/week. This re-organization of the waste collection routes led directly to the reduction of the cost of service, mainly the costs of the consumables (fuel, lubricant, and the need for maintenance and repair) and an overall improvement in the effectiveness of the use of the truck by 6%.

The technical condition of the truck is another element that affects the quality of service, readiness and safety components, as well as the time and costs of the use of the truck. As is known, technological truck has more technical problems or more defects due to frequent stops during the waste collection process or due to the corrosive feature of urban waste. Similar to other local government units in Albania, the proper maintenance of the truck is lacking, consequently has caused more defects and additional costs (approximately 310’000 ALL/year) for its repayment during the last years.

1. **Effective work of the personnel**

Another important factor affecting the cost of the service is the number of operating crew and their working hours. The use of the human resources relates to the number of workers employed directly in the waste collection and how fast they operate.

In the Commune of Dajc, the waste collection services are currently performed by a small team, comprising a driver and two workers, under the commune responsibility. Using a small brigade seems an economic and affordable solution for the commune relating to its size and financial resources. The working team is engaged on a full time basis (being paid a full salary for 40hours/week), while their direct involvement in the waste services foresees only 10-14 hours a week. Although, the team may be engaged in other public work activities, the effectiveness of their work does not seem the same as the collection of waste. This leads to increased cost of service, namely operating costs.

Also, the commune does not use any protocol or operating procedures[[10]](#footnote-10), safety manual or work performance standards for the organization of the service. Eventually the problems that may arise during the day-to-day operation are addressed on ad-hoc basis, without any adequate procedure to be followed. The local inspector or driver must take decision and find solutions for certain circumstances during the service operation without referring to any written procedures.  
However, taking into account the results of the second testing of the waste collection service (after some problems are being addressed), the working team operated faster and effectively[[11]](#footnote-11).

1. **Final conclusions and local benefits**

The commune of Dajç has been committed to proceed with the implementation of adequate measures and improvements regarding service organization within the frame time of project implementation and to continue next year with the remaining measures.

In fact, the acquisition of accurate data about waste generation and about the number of consumers including information about the level of residency, helped the local authorities to correct and provide accurate infrastructure and operations for waste collection and transportation, and consequently reduce the cost of waste service compared to the determinations made in the local waste management plan and the cost of waste treatment with 63%. According to the local data, today in the Commune of Dajç, the average waste generation per capita turns out to be about 0.35-0.4 kg /day.

To evaluate the improvements and the results achieved from the adoption of the organization of the waste collection service, the commune of Dajç re-tested the waste collection and transport routes. So, as a result of reducing the number of waste collection routes from four to three routes a week, the commune is able to reduce the transport costs (fuel) by 36% and waste collection costs by 40%, and to have available more hours to serve for other public services according to the needs of the community.

However, the local authorities through this case study has identified that there is a potential to enhance the quality, effectiveness and efficiency of the waste collection service, which can lead to further reductions in the cost of service. Among the most important measures are:

1. Effective use of the technological truck can be achieved mainly by the provision of joint waste collection services with other neighboring local government units in the region, e.g. through organizing inter-communal schemes. Moreover, the involvement of the Commune of Dajc into the upcoming sub-regional schemes for transiting and long distance transport (use of transfer stations), would reduce the time and costs for the transport of waste in the landfill Bushat.
2. Reorganization of the WCP network and better distribution of the containers according to the real needs, restructuring of the waste collection routes and better utilization of the truck capacity, will reduce working time for the collection of waste and consequently will enable the reduction of operating costs and improve the quality of the services. The determination of the service standards (e.g., the use of the containers and trucks, time of the operation, distances between WCP-s, etc.) that fit to local conditions and their enforcement may help local authorities to optimize the services.
3. Improvement of the technical condition of the containers and technological truck through providing adequate maintenance and repair service in an appropriate time, would ensure the best quality and readiness, and at the same time would reduce the time and cost of service.
4. The efficiency of the working crew is not related only to the ability of the workers to operate faster, but also relates to the adequacy of the entire waste collection system organization including the procedures and conditions of the trucks and containers. The establishment of an operational procedure for waste collection crew can be a model of case study, which can help them to operate faster and safer, in normal conditions or in unusual cases. To raise the effectiveness of the crews work, local authorities, that provide public services, are asked to review the working schedules and job descriptions and at the same time they are pushed to evaluate the financial consequences of their management. Improvement of the effectiveness of labor brigade can also be achieved through organizing joint schemes with other local government units, through organizing effective use of the waste equipment, design adequate collection routes, standardization and working protocol. Also their involvement in other public works should be defined and regulated.

1. For the first time [↑](#footnote-ref-1)
2. About 550ton per annum [↑](#footnote-ref-2)
3. According to the National Waste Management Plan, 2011 [↑](#footnote-ref-3)
4. Total waste collection routes within a week [↑](#footnote-ref-4)
5. Include the time to collect waste in a WCP and to travel to the consecutive WCP [↑](#footnote-ref-5)
6. The location and distribution of WCP, incding the number of containers [↑](#footnote-ref-6)
7. Comprising operating in all WCP [↑](#footnote-ref-7)
8. Waste must be removed manually [↑](#footnote-ref-8)
9. For e.g. only for 2012 went around 1'200'000ALL [↑](#footnote-ref-9)
10. technical and managerial [↑](#footnote-ref-10)
11. Reduce the average unit collection time from 4.5min/WCP to 4min/WCP [↑](#footnote-ref-11)