SymbioCity

WILLINGNESS TO PAY

A tool to improve solid waste management

A study from Shashemene and Debre Berhan

Willingness to pay

– A tool to improve solid waste management

Globally, the amount of municipal solid waste is growing faster than the rate of urbanization. In sub-Saharan Africa, waste generation is approximately 62 million tons per year ranging from 0.09 to 3.0 kg per person per day, with an average of 0.65 kg/capita/day[1]. Robust and sustainable solid waste management systems are needed to manage the growing waste amounts in order to mitigate and reduce the environmental and human health impact from waste.

In Ethiopia, the per capita generated amount of household waste ranges from 0.28 to 0.83 kg/person/day. The financial resources and institutional capacity to plan and operate solid waste management systems are in many Ethiopian cities falling short. Unmanaged or poorly managed solid waste management creates serious negative impacts on human health, environment and the economy. Also, in general, the most vulnerable groups are often the most negatively affected from poor waste management.

In effort to find ways to improve cost coverage for providing solid waste management services in two Ethiopian cities, we carried out a study to determine citizens' willingness to contribute to paying for solid waste management services. This text provides a summary of the results and explains how willingness-to-pay studies (WTP) can be a used as a tool when determining collection fees and to understand how citizens feel about contributing to the system.

An approach to underfinanced and inefficient solid waste management:

A way to improve the solid waste management service level, both in quantity and quality, is to revise the fee structure based on capacity and willingness to pay of the households that are part of the collective using the service.

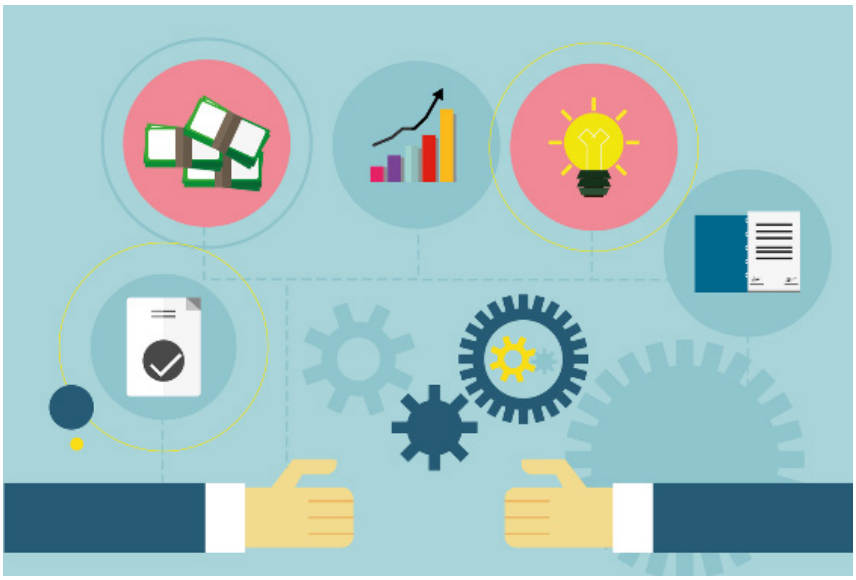
Economics of Municipal Solid Waste Management Systems in Ethiopian cities are generally categorized by:

- Informal fee collection.
- Poor cost coverage of services.
- Full cost accounting principles are not applied.
- Fees and budget allocation are not sufficient to cover capex and opex for expanding services.
- Erratic allocation from general budget to SWM makes long-term planning difficult.

[1] The World Bank, What a waste, 2012

Underperforming Solid Waste Management Systems are causing extensive environmental and human health hazards in many urban centers in Ethiopia.

Economics of Solid Waste Management



Solid waste management systems are complex, many components must work in order to obtain adequate results including awareness about proper SWM, robust and reliable service, stakeholder collaboration and efficient infrastructure. In mature solid waste management systems, the costs for operating the system are often carried by the fees collected by the users collective (i.e. the households, businesses and institutions using SWM services). In most systems these fees are mandatory, in some cases the costs are coved by local taxes. The fees should cover costs for planning, awareness, equipment, vehicles, salaries and costs associated with treating the waste. According to *full cost principle,* users of resources that causes environmental strain should pay their full cost.

In many developing countries local government struggle with technological infrastructure and capacity as well as opportunities to generate revenue. The lagging or insufficient spending on municipal services places strain on the urban environment and local economic activity, creating a vicious cycle of budgetary shortfalls and increasingly harmful urban conditions, and economic stagnation.

In many Ethiopian cities solid waste fee collection is informal and is handled between the door-to-door collector and the household. Costs associated with planning or operating other parts of the system other than the collection itself (like awareness, treatment, capital investment) is typically coved by allocation from the general budget. Solid waste management is often a large strain on the general budget and as cities also face the need to expand, improve and make systems more efficient, cost coverage is key. In the case of Ethiopian cities this means both keeping the cost of service low and improving the user collective's contributions to the system.

To be able to improve solid waste management, robust financing is crucial. When there is predictability and continuity of incoming financial resources a multi-year budget can be established and action plans implemented.

When it comes to building up a robust and sustainable solid waste management system there is no such thing as a one size fits all. Solutions need to be adapted to the conditions in that area. The best way to approach finding solutions is for the city administration to find ways to collaborate with stakeholders to find the best solutions that fits for respective city.

A way to increase the revenue to operate the solid waste management system is to increase the fees from the user collective. In a system that is undergoing formalization, expansion and improvement, it is not easy to justify increased fees since many subscribers get unreliable, unsatisfactory or absent service. This causes many systems to remain in a type hen-or-egg situation, where no new funds are coming into the system and the system continues to underperform warranting no fee increases. **A willingness-to-pay study can provide insight into how valuable the citizens think an improvement of the system is. It is also an important tool for making decisions on how to update fees. Willingness to pay is the maximum amount someone is willing to pay for a product or service.**

The study

Within the SymbioCity Project in Ethiopia a willingness to pay study was conducted in 2019 in both Shashemene and Debre Berhan to determine factors influencing the maximum amount households are willing to pay for improved waste collection service. The study included 594 randomly selected households, evenly distributed within the two cities. Shashemene had slightly more samples than Debre Berhan, being a larger city. The study was based on a questionnaire collecting anonymous data about the respondents and their current view on solid waste management service. Questions to the respondents included marital status, number of persons in household, average income, average expenditures, occupation and time spent in the respective city. The perception of current solid waste management service was determined with questions such as amount of solid waste generated by households, quantity, quality issues, service charge, reliability of service and general perception of the service.

The study used two types of questions in order to find out how much a household is willing to pay and the factors determining the maximum willingness to pay. Close-end questions (yes or no) using bids followed up by open-end question where the respondents state their maximum willingness to pay. The responses were collected and analysed to find the intervals of what the respondents perceive as an acceptable fee that they are willing to pay. After that a validity test of the regression analysis was done to capture any outlier data that would skew the result the final estimation of total willingness to pay was concluded.

The study showed that most of the respondents are aware of the correlation between a substandard solid waste management and the consequences it entails for human health and the environment. It is often assumed that people cannot afford increased fees and there is a presumed political risk to introduce new fees. However, this study and other willingness to pay studies can help determine sustainable fee levels that the community are willing to contribute if the services are improved. According to our study, if a clear improvement can be achieved, people are willing to pay about 50 percent higher fees compared to current collection fees. The study has found that households are willing to pay between 39.24 and 46.32 birr per month for improved solid waste management. The study also found that more than 90% of household respondents gave a response over zero when asked if they were willing to pay for solid waste management services, indicating that there is wide acceptance for fee charges for improved service.

WTP provides a basis for making relevant political decisions by:

- Providing baseline information about current payments and attitudes toward SWM.
- Identifying factors that affect customer satisfaction.
- Identifying suitable fee levels.
- Can provide science based evidence and background for taking decisions on fee increases.

The study shows that:

- Only 70% of the city is covered by collection service.
- 61% are dissatisfied with the existing solid waste collection service.
- Most households pay about 7 birr per collection but there is no standard price for the collection service, the price can be negotiated and sometimes door-to-door without license's collect waste under the price of the official collectors.
- The average of SWM collection price is 30.1 birr per month.
- The average monthly income of the responding households is 2500 birr, the current SWM cost of 30 birr is about 1.2% of the households monthly income.

The study also shows that certain households' characteristics such as income, occupation, house ownership and time spent in the town is positively correlated with willingness to pay. This means that the respondents who have lived in the city longer are more willing to pay for services than respondents who are new in town. The study also indicates that respondents with higher education are more willing to pay for services. There can be many factors that influence this outcome but it gives an indication that awareness and understanding about the adverse impacts of poor solid waste management are important for the willingness to pay. Another important driver for willingness to pay is that the respondents see a wider benefit for the society for example that the solid waste management industry creates jobs for the community.

In order to succeed in gaining an overall acceptance for increased fees in exchange for an improved solid waste management it is strongly recommended to make improvements first and then increase the fees, or at the very least introduce changes and new fee collection at the same time so that users can see that the improvements are delivered. By doing so, it will show that improved waste management will impact the local area positively and motivate the citizens to pay a higher collection fee. It also provides assurance that the increased fees are used for the intended purpose. Along with improvement measures for solid waste management collection with better reliability and frequency, other actions should also be taken in order to boost the success of changes. This can include awareness creation, improved safety routines for SWM collectors and better follow-up of the collection services by the city administration to ensure better service delivery.

Managing waste properly is essential for building sustainable and liveable cities. Effective waste management is associated with costs, often comprising a large part of municipal budgets. Operating this essential municipal service requires integrated systems that are efficient, sustainable and socially supported. The citizen's engagement is important, public participation is key to a functional waste system and by using a willingness to pay study it is possible to determine how much they are willing to contribute to the system. If the cities can meet the challenge and create sustainable solid waste management, the benefits are many; a better local environment, reduced health risks and an increase in the living standard for all. In Ethiopian cities vulnerable groups are often most affected by poor solid waste management, causing further strain on these groups' health.

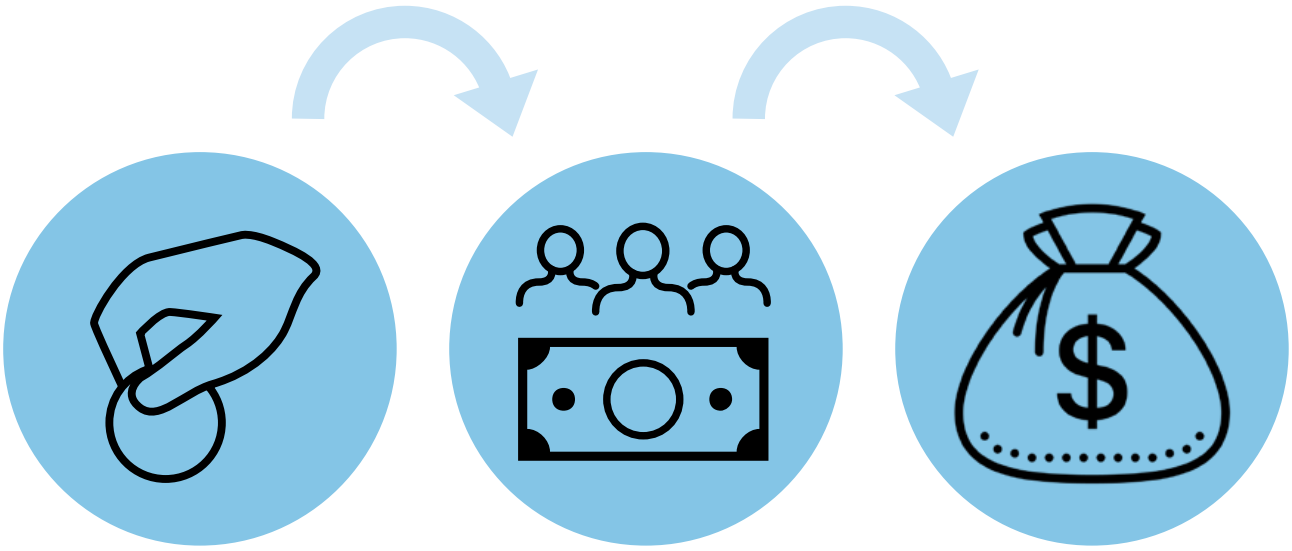
Households are willing to pay between **39.24 and 46.32 birr per month** (**for an average of 4–5 sacks**) for improved solid waste management.

The study results on why people are dissatisfied with the current solid waste collection services:

- Low frequency, average is 3.56 times a month.
- Poor collection quality.
- Unreliability of service.
- Large cost of the service.
- Improper dumping places.

Factors influencing and increasing willingness to pay:

- Understanding the benefits of proper solid waste management.
- Showing results and robust service will increase willingness to pay.
- Creating sustainable jobs in the sector and showing how proper SWM provides wider benefits to society will also increase support for the service.



By increasing fees from the users-collective to better cover costs of collecting and handling solid waste the solid waste system can continually be improved.

QUESTIONNAIRE

Name of the interviewer _____

Kebele Name _____

Date _____

Start time _____**End time**_____

Questionnaire ID _____

Hello, how are you.

I am here today to ask you for some information on the current SWM services in Shashemene city. This information will be used for research that is a part of an ongoing SymbioCity/Sustainable Urban Planning project in the city. One important issue for a sustainable city is an efficient municipal solid waste management (SMW) system. Municipal solid waste collection and management needs sustainable funds to recover the costs incurred for managing the waste. The current insufficient system largely lacks funds and the municipality is working to improve this. The research is based on the premises that polluters pay for a sustainable management of solid waste. The study aims to know how much households of the town are willing to pay for the improvement of SWM. The result of this study will be used as an input for the city's decision makers to improve the current situation of Solid waste management. Therefore, you are kindly requested to actively participate in this questionnaire and be free while you give your opinion. It will take us a few minutes and your active cooperation is essential to complete this task on time. Please feel free to ask regarding any unclear questions to get further clarifications. There are no wrong answers and questionnaires are anonomous, thus respond honestly and truthfully to the questions as much as you can.

Thank you in advance!

Section I:

Socio-economic information

The next few questions are required to collect some information on the socio-economic situations of respondents. This information assists the researcher to relate willingness to pay of households with their respective socio-economic status and nothing to do with the personal issues of respondents. The information is analyzed and interpreted in aggregation. Therefore, be relaxed and react truthfully to each question.

1. **Gender:** 1. Male 2. Female

2. **Marital status of the respondent:**
   1. Married 2. Single 3. Widowed 4. Divorced

3. **How old are you?** _____Years of age.

4. **Education level** _____.
   1. Primary school 2. Secondary school
   3. TVET (Vocational school) 4. University 5. None

5. **Occupation:**
   1. Government employee 2. Private business 3. House wife
   4. Student 5. Self employed 6. Unemployed
   7. Retired 8. Other, specify:_____.

6. **How much is your personal gross income per month (excluding your family's income)?**
   _____birr

7. **How many people are in your household including yourself?**
   _____ people.
   No of adults ≥15 years old_____
   No of children <15 years old_____

8. **Please tell me the monthly income of your household members**
   1. Person 1_____birr 3. Person 3_____birr
   2. Person 2_____birr 4. Person 4_____birr
   5. Person 5_____birr 6. Person 6_____birr

9. **On average how much does your household spend on the following items per month?**
   Food_____birr Electricity_____ birr
   Transport_____ birr Water_____ birr
   Clothes_____birr Other expenses_____ birr

10. **Do you own a house?**
    1. Yes 2. No

11. **Does your household have access to toilet?**
    1. Toilet with sceptic tank_____ 2. Pit latrine_____3. None_____

12. **For how many years have you lived in Shashemene town?** _____Years.

Section II:

Questions on the current state of solid waste management

1. **How much waste is generated from your house weekly?**
   _____sack/sacks (number).

2. **Are you paying for the solid waste collection service?**
   1. Yes 2. No

3. **If yes to QNO.2 above, how much do you pay for the waste generated per month from this household?**
   _____ birr per month.

4. **If NO, to QNO.2 above, are you willing to pay for a solid waste collection service?**
   1. Yes 2. No

5. **How would you rate the existing solid waste collection service in relation to its frequency, quality and reliability?**

   a) Frequency *(Are the collectors coming regularly)*
   1.Good 2. Average 3. Poor

   b) Quality (*Is the service up to standard*)
   1.Good 2. Average 3. Poor

   c) Reliability *(Are the collectors carrying out their tasks reliable)*
   1.Good 2. Average 3. Poor

6. **In your experience how often do you get solid waste collection service within one month?**
   _____ days.

7. **Are you satisfied with the existing Solid waste collection service?**
   1. Yes 2. No

8. **If "No" what are the main causes of your dissatisfaction?**
   (Multiple answers possible)
   1. Low collection frequency 2. Poor collection quality
   3. Unreliability 4. Large cost of service
   5. Frequent dumping of waste in improper places (sewage, open space, streets)
   6. Other reason, specify:_____

9. **Has there been any interruption of Solid waste collection service?**
   1. Yes 2. No

10. **If "Yes" on average how frequent was this interruption?**
    1. Daily 2. Weekly 3.Bi-weekly

    4. Monthly 5. If other time, specify:_____

Section III:

Households willingness to pay for improved waste collection services

Next, I would like to ask you how much value you are willing to pay for an improved solid waste collection service. This section presents you how much you value the improved waste collection service and you reflect in monetary terms.

1. **Are you willing to participate in any solid waste collection improvement program?**
   1. Yes 2. No

2. **If "Yes" suppose that the town's solid waste management office made the improved waste management service available, would you be willing to pay _____ birr per one sack of waste?**
   1. Yes 2. No

3. If the answer to Q.2 is 'Yes', ask the following question:
   If the price of improved solid waste collection service per sack is increased to (2x), _____birr per one sack, would you be willing to pay?
   1. Yes 2. No

4. If the answer to Q.2 is 'No', ask the following question:
   If the price of improved solid waste collection service per sack is decreased to (0.5x), _____birr per one sack, would you be willing to pay?
   1. Yes 2. No

5. **What is the maximum you could pay for one sack of waste from this improved waste collection scheme?**
   _____birr per one sack.

6. (To Interviewer)
   If the maximum amount that they would like to pay for the improved waste collection service is 'zero', ask them why they do not want to pay?
   1. Waste should be provided free of charge
   2. I am satisfied with the existing collection service
   3. I do not have enough money
   4. I know that the money will not be used properly
   5. Other reason specify

SymbioCity supports local governments in addressing several of the Sustainable Development Goals (SDGs) and in implementing the principles of the New Urban Agenda. The overall goal is to improve living conditions with a special emphasis on the urban poor.

IMPLEMENTING THE NEW URBAN AGENDA

11 SUSTAINABLE CITIES AND COMMUNITIES

1 NO POVERTY · 5 GENDER EQUALITY · 6 CLEAN WATER AND SANITATION · 7 AFFORDABLE AND CLEAN ENERGY · 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE · 10 REDUCED INEQUALITIES

12 RESPONSIBLE CONSUMPTION AND PRODUCTION · 13 CLIMATE ACTION · 14 LIFE BELOW WATER · 15 LIFE ON LAND · 16 PEACE, JUSTICE AND STRONG INSTITUTIONS · 17 PARTNERSHIPS FOR THE GOALS

SymbioCity

SKL International
AFFILIATED TO THE SWEDISH ASSOCIATION OF LOCAL AUTHORITIES AND REGIONS

Swedish Association of Local Authorities and Regions

SymbioCity is based on Swedish municipalities' approach to urban development and experiences from implementing this in transition- and developing countries. Since 2010, with funding from the Swedish International Development Cooperation Agency (Sida), the Swedish Association of Local Authorities and Regions (SALAR) and SKL International have used SymbioCity as an approach and a method to promote sustainable urban development and contribute to the alleviation of urban poverty around the globe.

To learn more about SymbioCity please see www.symbiocity.org, call phone +46 (0)8 452 70 00 or send us an e-mail on info@sklinternational.se