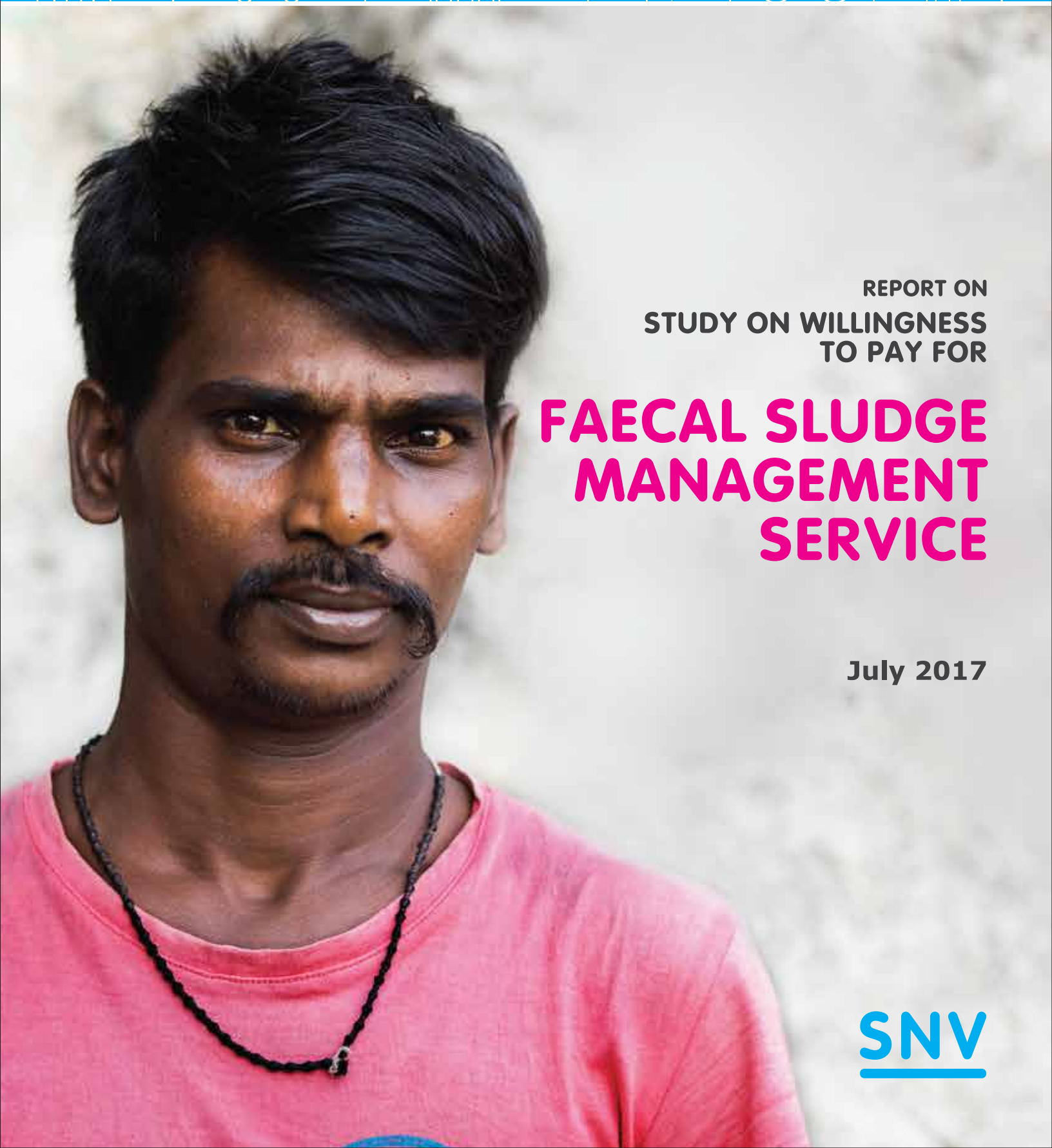


REPORT ON

STUDY ON WILLINGNESS TO PAY FOR

FAECAL SLUDGE MANAGEMENT SERVICE

July 2017

SNV

A STUDY ON WILLINGNESS TO PAY FOR

FAECAL SLUDGE MANAGEMENT SERVICE

July 2017

SNV

Research Advisor
Rajeev Munankami
Team Leader
FSM Programme
SNV Netherlands Development Organisation

Research Coordinator
SAM Husain
Behaviour Change Communication Advisor
FSM Programme
SNV Netherlands Development Organisation

Prepared by

Consiglieri Private Limited
House#360 (first Floor), Lane#5
Baridhara DOHS
Dhaka, Bangladesh
Website: www.consiglieri.com.bd
Email: info@consiglieri.com.bd
Phone: +88028418708

Design: Md. Mosarof Hossain (Azad)
Publication Dpt., Drik

Cover Photo: Tushikur Rahman/Drik

Suggested citation: Consiglieri, 2017. A Study on Willingness to Pay for Faecal Sludge Management Service. Dhaka: SNV.

ACKNOWLEDGEMENT

We are thankful to SNV Netherlands Development Organisation for commissioning this study to us. We would like to acknowledge the contribution of SNV staff both at Head Office and Field Offices who provided their valuable feedback and helped us to get access to the City Corporation and Municipality offices in the 3 cities visited. Thus, this report is an output of a collaborative effort between SNV and Consiglieri Private Limited. We acknowledge the contribution of all the respondents of this study as well. Without their time and inputs, this study would have been incomplete.

We would like to convey our gratitude to the research team – Ferdous Ivan, Aslam Parvez, Sheikh Farid Uddin Ahmed, Syed Mizanur Rahman, Sabit Sabat, Sabir Islam, and Raiyan Sabbir for their sincere efforts. Without their hard work it would not have been possible to complete this assignment.

SAM Husain, Behaviour Change Communication (BCC) Advisor, FSM programme, helped us with the overall organisation throughout this study and Consiglieri acknowledges his valuable contribution and support.

We also acknowledge the technical and administrative support provided by Mahmud Chowdhury, M&E Advisor; Shahidul Islam, Governance Advisor; Sahidul Islam, Engineering Advisor; Tanvir Chowdhury, Sanitation Business Advisor; Munshi Ruhul Amin, City Coordinator; and Mahbuba Islam, Program Officer, Knowledge Management of FSM Programme.

Finally, we would like to acknowledge the supervisory role of Rajeev Munankami, Team Leader, FSM Programme and cordially thank Jason Belanger, Country Director for SNV Bangladesh.

Abdullah Sakib

ACRONYMS

OSS	On-site Sanitation
BDT	Bangladeshi Taka
FSM	Faecal Sludge Management
KCC	Khulna City Corporation
KM	Kushtia Municipality
JM	Jhenaidah Municipality
CDC	Community Development Committee
CBOs	Community-based Organisation
WTP	Willingness to Pay
CBC	Choice-based Conjoint

CONTENTS

LIST OF **FIGURES**

LIST OF **TABLES**

EXECUTIVE **SUMMARY**

Increasing access to sanitation is a global priority with 20% of children dying from Diarrhea related diseases globally, which is more than that of AIDS, Malaria, and Measles combined. Bangladesh is a densely populated country with overcrowded cities and towns that have sprawled and expanded over time. Overcrowding often leads to a host of management challenges within the towns and cities including Faecal Sludge Management (FSM). Although Bangladesh has achieved notable success in the last 10-15 years with regards to FSM, there is much room for improvement. The laudable achievement was made possible by a remarkable growth in On-site Sanitation (OSS) facilities. A major reason for lack of FSM services in southern hubs of Bangladesh is lack of awareness about how to safely managed and dispose faeces, as well as a lack in coordination and understanding of responsibilities of FSM service providers. Emptying practices are predominantly done by manual emptiers, which is a very unhygienic process that leads to undesirable outcomes for the environment and the workers. The use of mechanical emptying services, specifically the vacutug, is still at a nascent stage in the cities of Khulna, Kushtia, and Jhenaidah, which is the focus of this study.

Against this backdrop, SNV is executing a project titled, "Demonstration of Pro-poor Market-based Solutions for Faecal Sludge Management in Urban Centres of Southern Bangladesh". The main objective

of the project is to demonstrate a city-wide, pro-poor, accountable, safe, and sustainable faecal sludge management service for the urban context in Bangladesh. The project areas are Khulna City Corporation (KCC), Kushtia Municipality (KM), and Jhenaidah Municipality (JM).

Consiglieri Private Limited (CPL) was commissioned by SNV to conduct a study to find out users' willingness to pay for safe emptying services, available options for tariff structures, and the roles/ responsibilities of service providers in sustaining, operating, and maintaining the services. CPL conducted the study in the 3 above-mentioned cities and interviewed both users and non-users of vacutug-based mechanical emptying services. Among the non-users, there were those who employed a different manual emptying service, and their views were also noted. This report is divided in three major parts based on the 3 cities where the study took place.

The study utilised a combination of Choice-based Conjoint Analysis (CBC), Market Analysis, and social research methodologies. The first major area of investigation focused on customers' Willingness to Pay (WTP) for safe emptying services using CBC, widely used in market research studies. The second major area of investigation sought to understand the underlying factors that influence customers' willingness to pay for a product or service, which in this case would be for safe emptying service. A combination of psychoanalytic probing along with internal and external considerations was analysed for this purpose. The approach used for this was the SaniFOAM approach. The third major area of investigation focused on the various service providers that undertake emptying services, both mechanical and manual. Service providers' preparedness and capacity to cater to market demand, as well as the financial feasibility of small to mid-scale FSM businesses, were analysed to get a clear picture of the supply side.

Judgmental sampling or purposive sampling method used to select the study's informants. Under this nonprobability sampling method, the researchers chose the study's sample based on who they considered appropriate for the study's objectives. The decision was made upon consultation with the client and through a literature review. The table below presents the respondent categories and the respondents.

Table 1: Respondents of the study

Municipality/City authority-led emptying service providers	Senior managers
	Operations (emptiers, operators, maintenance service providers)
Community-based vacutug emptying service (Community Development Committee)	Senior managers
	Operations (emptiers, operators, maintenance service providers)
Informal emptying services managed by independent workers	Operations (emptiers, operators, maintenance service providers)
Mechanical emptying service Users/Non -users	Users
	Non-users

The highlights of the study, per city, are summarised in the succeeding pages.

Khulna

In Khulna City Corporation (KCC), vacutug-based mechanical service is provided by the KCC itself and also by Community Development Committees (CDC). CDC is a community organisation that provides mechanical emptying services through 3 different clusters in KCC with a fleet of three capacity trucks of 1,000 litres each donated by UNDP. There are also hundreds of manual emptiers plying their trade for generations.

Emptying practices of HHs is mostly reactive than proactive and most respondents still prefer night time for emptying. CDC-run vacutug scheme is easily accessible for the residents without much paperwork. However, KCC-run scheme entails formal application process and submission of payment through a bank draft. The KCC application process sometimes puts off potential users. The most important attribute for users of vacutug service is smell free removal of sludge followed closely by safe and proper removal of sludge, whereas non-users (manual emptying) rated quick and timely delivery as the most appealing factor for availing the manual emptying service. Users mentioned that prevention of smell and disgust in the main reason why they opted for mechanical emptying service over manual service.

Another important observation was that vacutugs do not always get the job done fully, especially with regards to hard sludge accumulated at the bottom. In such situation manual emptiers are called upon to manually clean the hard sludge. Vacutug trucks sometimes fail to reach hard-to-reach areas or crowded areas, entailing the need to call manual emptiers again. The service delivery time for mechanical emptying can vary from 2-3 days on an average and even more if there is large queuing. On the other hand, manual emptiers can render the service within the same day or by the next day.

When looking at the tariff structure, KCC had the highest tariff structure compared to the other 2 cities. A customer may end up paying around BDT 4,000 for availing the vacutug service of the 5,000 litre truck. However, CDC-run scheme is much cheaper, charging around BDT 1,000 per trip for their 1,000 litre vehicles. From field investigation it was also seen that there is a greater demand for CDC-run vehicles than for the KCC-run vehicles. Respondents had mixed feelings about the tariff structure but mostly unfavourable view about the charge of KCC. Through conjoint analysis, willingness to pay of HHs in KCC was found out to be around BDT 2,000. To keep alignment with customers' expectation, a revised tariff structure was formulated and to be found in the report. The KCC needs to add smaller vehicles to their fleet to cater to all types of customers (big or small). The recommendation would be to reduce the tariff rate but increase the subscription in order to achieve break even. Cost-wise there is not a substantial difference between manual emptiers and mechanical emptying (vacutug). It is mainly lack of awareness about the benefits of using mechanical emptying, which is contributing to low demand for vacutug-based mechanical emptying service. Greater awareness building campaigns may be useful involving the NGOs and other relevant stakeholders of the society. There is no immediate plans to allow private sector operators in the market but if the demand trend shows an increase and if KCC fails to cater to customers' demand promptly, then private sector actors may be allowed to operate. Building of treatment plant will also ensure proper disposal of the faecal sludge. Furthermore, manpower related to FSM need to be given proper training to make them efficient in discharging their duties. KCC organogram needs to include a dedicated wing for FSM to ensure effective service delivery.

Kushtia

In Kushtia Municipality (KM), vacutug-based mechanical service is provided by the KM itself with its fleet of 3 vacutugs having different suction capacities (1,000, 2,000, and 4,000 litres). There is no organisation like CDC working in Kushtia as seen in Khulna. In Khulna, emptying practice is mostly reactive. FSM is usually at the bottom of the HH priorities. Unlike Khulna, HHs showed preference for cleaning activity in day time. The application process is similar to that of Khulna except, customers can avoid the hassle of paying through bank and can make cash payments.

Service delivery time for KM is usually within 48 hours after application but in some cases it could be longer. On the other hand service delivery by manual users is usually within 24 hours. Therefore, in an emergency situation HHs would rather prefer manual emptiers for prompt service, rather than waiting for the vacutug to arrive.

The most important attribute for users with regards to vacutug is clean and safe removal of sludge followed by lack of smell and disgust during emptying. In general HHs viewed mechanical emptying favourably. They feel that the process is hygienic and proper disposal away from their homes is ensured. Peer pressure is another factor that encourages people as a community to avail mechanical service. Even people who used manual emptying service before are interested to avail the vacutug service during their next cleaning mission.

With regards to pricing of the service, vacutug users expressed satisfaction with the tariff structure. Among all the 3 cities, tariff rate in Kushtia is the lowest. The overarching idea is to popularise the service first and increase the price gradually. Not surprisingly, willingness to pay for emptying service in Kushtia is lower compared to Khulna. This is mostly because they are used to paying low and their willingness to pay reflects that. However, WTP is aligned with what the KM is charging right now. The existing tariff structure is good to continue. However, greater awareness building campaigns to increase customer base should be a priority. Currently the KM is rendering the service reasonably well but addition of 2-3 more vacutugs in the existing fleet would ensure much better service quality and minimal time-lag between service request and service receipt. The operational force related to FSM service needs to be brought under a regular training plan and training manuals could be developed in collaboration with development partners. There are no immediate plans to allow private sector operators in the market, but if the demand trend shows an increase and if KM fails to cater to the customers' demand promptly, private sector actors could be allowed to operate in this circumstance. The KM organogram needs to include dedicated wing for FSM for effective service delivery.

Jhenaidah

In Jhenaidah Municipality (JM), vacutug-based mechanical service is provided by the JM itself with its fleet of 2 vacutugs, having different suction capacities (1,000 and 2,000 litres).

HH emptying practice in Jhenaidah is not proactive as seen in the other two cities. In case of users of manual emptying, almost all of the respondents preferred night time for emptying. This is because stink is released into the air during the emptying process of the pits, which is hard to bear. However, vacutug users had no problems emptying during day time since they know it will not spread bad smell and disease. The application process to avail the vacutug service is simple enough with a simple application form accompanied by required fee. The time-lag between service application and service delivery for vacutug is around 24-48 hours, whereas for manual emptying it is relatively faster and sometimes immediately after calling.

Most respondents who have employed vacutug service consider clean, safe, and proper removal of sludge as the most important attribute of mechanical emptying. They believe that sludge is safely removed and dumped into a safe place, away from their habitat area. Low visibility of dirty sludge and lack of bad smell during emptying process was also ranked very highly by the users. Users of manual emptying rated total removal of sludge as most important followed by prompt service. Users of vacutug also mentioned that concern for the overall environment prompted them to employ the vacutug service. Non-users or manual users cited that during their last emptying process they did not know much about the vacutug service, therefore, did not use it. However, there was general curiosity and willingness among non-users to employ the mechanical emptying scheme for their next emptying mission.

With regards to pricing structure it was seen that the tariff is reasonably lower for the customers and also quite aligned with their willingness to pay to avail the service. Through conjoint analysis, it was seen that WTP for Jhenaidah residents was BDT 2,840, which is higher than what JM is actually charging. However, instead of increasing the tariff structure to a larger extent, focus should be given to garner more and more customers through awareness building campaigns. The JM is operating at one-third of its capacity, therefore, it is imperative to try to expand to the full operating capacity. There is no urgent need to increase the fleet size now but future spikes in demand may require further addition to the fleet. A large capacity vacutug (4,000 or 5,000 litres) should be added then to cater to the large volume customers. There is also immediate need to provide proper gear and training to the operational force of the vacutug scheme.

Since the JM is running the vacutug operation at below capacity, allowing private sector operators at this moment may not be prudent. However, feasibility analysis for entry of private sector could be conducted as part of future planning. The JM organogram also needs to include dedicated wing for FSM for effective service delivery.

CHAPTER ONE

BACKGROUND AND **INTRODUCTION**

1.1 BACKGROUND AND OBJECTIVES OF THE STUDY

Bangladesh, a country of 160 million people, has achieved commendable sanitation success during the 15-year Millennium Development Goals (MDGs) period. The laudable achievement was possible through a remarkable growth in On-site Sanitation (OSS) facilities.

Until now, the management of faecal sludge resulting from these on-site technologies has been grossly neglected. Financial resources are often lacking, and on-site sanitation systems tend to be regarded as temporary solutions until sewer-based systems can be implemented.[1]

A root cause for lack of FSM services in Southern Bangladesh particularly in Khulna, Jhenaidah and Kushtia, has been that that there is no clear assignment of responsibilities with regard to faecal sludge management among the utility service providers. There is also lack of awareness among these institutions and organisations regarding FSM. As a result, there is a lack of concerted effort by all the concerned to address this serious issue. In all urban areas, unhygienic manual emptying systems predominate the mechanical emptying system using 'vacutug' because of its limited availability and lack of public awareness.

[1]Hutton, G., Haller, L., Bartram, J. (2007). Global Cost-benefit Analysis of Water Supply and Sanitation Interventions. Journal of Water and Health | 05.4 | 2007

Under the overhead circumstances, SNV Netherlands Development Organisation is executing a project titled, "Demonstration of Pro-poor Market-based Solutions for Faecal Sludge Management in Urban Centres of Southern Bangladesh". The main objective of the project is to demonstrate a city-wide, pro-poor, accountable, safe, and sustainable faecal sludge management services for the urban context in Bangladesh. The project is willing to know users' willingness to pay (WTF) for safe emptying services, available options for tariff structures and the roles/responsibilities of service providers in sustaining, operating, and maintaining the services.

250,000 additional people will have access to improved sanitation facilities

1 million people will have an improved living environment and access to FSM services

Sector stakeholders agreed to replicate key elements of the approach for FSM

Broader objectives of the assignment are to:

- Evaluate the willingness to pay of communities in Khulna, Jhenaidah, and Kushtia for safe emptying services
- Delineate options for tariff structures
- Determine the roles/responsibilities of service providers in sustaining, operating, and maintaining the services

The scope of this assignment also includes:

- Determine actual cost of services and existing tariff for clients for safe emptying
- Identify reasons for willingness to pay for the safe emptying
- Determine preconditions that households and the communities may have for willingness to pay for FSM services
- Determine traditional norms within the communities for FSM including willingness to contribute if required for FSM services (FSM Tax, monthly subscription fee, weekly collection fee etc.)
- Identify options for tariff structures for safe emptying services in each city, including but not limited to:
  - Options for tariff structures and the roles/responsibilities of service providers
  - The process, benefits, and costs of implementing options
  - Detail description of options for implementation
  - Traditional norms that are appropriate for the communities

Figure 1: Willingness to pay study

1.2 ANALYTICAL FRAMEWORK OF THE STUDY

Accurately gauging consumers' willingness to pay for a product or service is critical for formulating competitive strategies and developing new products. It is also important for implementing various pricing tactics, such as nonlinear pricing, one-to-one pricing, and targeted promotions. Several approaches have been developed for this purpose. The approaches to measure consumer WTP can be differentiated whether they measure WTP directly or indirectly and whether they measure consumer hypothetical or actual WTP.

In practice, some researchers favour the direct approach, asking consumers directly to state their WTP for a specific product through, for example, an open-ended (OE) question format. Others prefer an indirect approach, such as Choice-based Conjoint (CBC) analysis, in which WTP is calculated on the basis of consumers' choices among several product alternatives and a 'none' choice option.

In this study, a mixed method, combining Choice-based Conjoint analysis (CBC), Market analysis, and social research methodologies was used.

Conjoint Analysis to Measure Customers' Willingness to Pay

The first major area of investigation was finding out customers' willingness to pay for safe emptying services using Conjoint analysis technique widely used in market research studies. Accurately gauging consumers' willingness to pay for a product or service is critical for formulating competitive strategies and developing new products. It is also important for implementing various pricing tactics, such as nonlinear pricing, one-to-one pricing, and targeted promotions. By following Conjoint analysis method, calculation of WTP was based on simulation of a real market that enables determination for each individual of the price at which the product studied is no longer selected over a competitor using the utility function of the consumer or user.

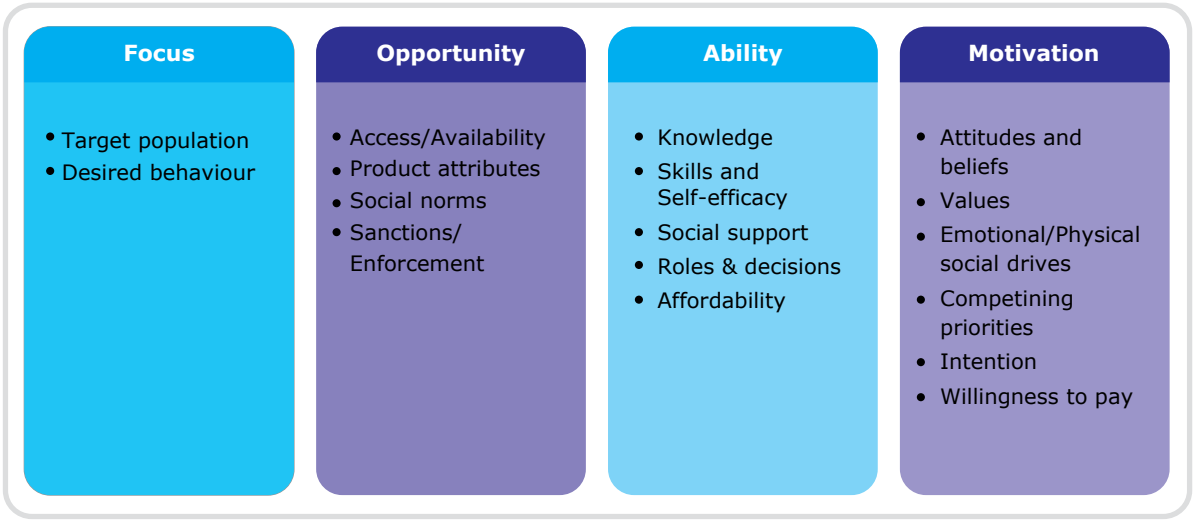
Utilising SaniFOAM Framework to Find Out Underlying Causes, Drivers, Factors Influencing WTP

The research endeavour also focused on a key component of sanitation practices, i. e., management of faecal sludge. Wherever there is a human habitation, faecal sludge would be generated and for a densely populated country like Bangladesh the problem becomes more acute considering unplanned construction of cities and towns and lax regulations regarding FSM. Unsafe faecal sludge management has a profound effect not only on public health but also on communities' social wellbeing. Traditional approaches to improving sanitation, which are aimed at sanitary toilet establishment is not sustainable without safe and proper FSM. So many strategies have focused on creating demand for improved FSM by changing behaviours while strengthening the availability of supporting products and services.

Thus, the second major areas of investigation revolved around digging up the underlying reasons, that influenced customers' willingness to pay for a product or service. In this case would it be for safe emptying service. A combination of psychoanalytic probing along with internal and external considerations was analysed for this purpose. The approach used for this was SaniFOAM approach. SaniFOAM is a conceptual framework designed to find answers of some key questions. It was developed in Durban, in February 2008, at a workshop attended by participants from 6 organisations including UNICEF, the London School of Hygiene and Tropical Medicine, USAID, and AED/Hygiene Improvement Project. SaniFOAM has been successfully used in several countries to design qualitative and quantitative surveys, develop communication materials supporting community-led efforts aimed at eradicating open defecation, and design a strategy aimed at strengthening the supply of sanitation products and services.[2]

Since this study is looking into willingness to pay for existing and potential customers, the SaniFOAM framework provides a tried and tested method to gauge respondent willingness and delve into the underlying factors for their behaviour. However, the study utilised and incorporated select elements of the SaniFOAM framework, in accordance with its objectives. The figure below illustrates the elements of the SaniFOAM framework.

Figure 2: SaniFOAM framework elements



Market Analysis to Determine Tariff Structure and Service Provision Model

The third major area of investigation focused on the various service providers providing emptying services, both mechanical and manual. The service providers' preparedness, capacity and financial feasibility to cater to this market was analysed to get a clear picture of the supply side scenario with greater focus on existing tariff structures of different service providers.

[2]Page: 5, Introducing SaniFOAM: A Framework to Analyse Sanitation Behaviours to Design Effective Sanitation Programmes; Jacqueline Devine; October 2009

Thus, demand and supply side considerations would be juxtaposed to identify major constraints to widespread adoption of safe emptying services among the households in the 3 cities/towns in question. The overarching goal is thus to determine the roles/responsibilities of service providers in sustaining, operating and maintaining these services and come up with the best fit tariff structure to ensure greater adoption of safe emptying services.

1.3 GEOGRAPHIC SCOPE

The study was conducted in the 3 project Districts located in south west of Bangladesh, namely Khulna, Kushtia, and Jhenaidah. The study areas encompassed Khulna City Corporation of Khulna District and Municipalities of Kushtia and Jhenaidah.

1.4 METHODOLOGY

1.4.1 Sampling Plan

Judgmental sampling or purposive sampling method was adopted for this particular study. Under this non-probability sampling method, the researchers chose the sample based on who they think would be appropriate for the study. The decision was made upon consultation with the client and literature review.

Box 1: Study respondents

1. **Municipality/City authority-led emptying service providers**
   a. Senior management
   b. Operational force (emptiers, operators, maintenance service providers)
2. **Private sector emptying service providers**
   a. Senior management
   b. Operational force (emptiers, operators, maintenance service providers)
3. **Informal emptying services (manual emptiers)**
4. **Household owners**
   a. Users of mechanical emptying service
   b. Non-users of mechanical emptying service (including those who never employed any type of emptying service)

1.4.2 Key Considerations and Respondent Profile

- The analysis was done separately for each of the 3 cities, due to the fact that respondents from each city will have variances in willingness to pay depending on their practice of FSM in that city and the existing service provision model.
- Although the project focuses on pro-poor market-based solution for FSM, the HH respondents consists of a mix of lower, lower-middle income and middle income group of people since the incidence of usage of mechanical emptying service among poorer HHs is very low. Thus to capture the cost, perception and utility aspects of mechanical emptying service, non-poor HHs were also interviewed.

- Only owners of the households were considered for interview since they are most likely to end up paying for the service.
- Since the respondents were mostly owners, there was less probability of them being poor. Instead of using any measuring tool to define poor, CPL used subjective judgment to determine who is non-poor and relatively poor. Separate analysis between non-poor and relatively poor HHs has been conducted only for some key areas, such as willingness to pay for FSM.
- The report denotes users as respondents who have employed vacutug service for emptying and non-users as respondents who have not used it. Within the non-users there were some who have never employed emptying service but were interviewed nonetheless since they were seen as potential users. Thus, for some analysis, all the non-users data could not be used since data were not available for those type of non-users who never employed emptying service.

The sample distribution is depicted in the following table:

Table 2: Sample distribution

Respondent Category	Respondent Type	Sample Size			
		Khulna	Jhenaidah	Kushtia	Total
Municipality/City authority-led emptying service providers	Senior management	2	2	3	7
	Operational workforce (emptiers, operators, maintenance service providers)	2	1	2	5
Private sector managed emptying service providers	Senior management	2	-	-	2
	Operational workforce (emptiers, operators, maintenance service providers)	2	-	-	2
Informal emptying services managed by independent emptiers	Emptiers, operators, maintenance service providers	3	2	2	7
Mechanical emptying service users/non-users	Users	13	15	13	42
	Non-users	21	20	20	61
Total Sample		**45**	**40**	**39**	**125**

1.5 RESEARCH TOOLS AND DATA COLLECTION APPROACH

Because of the nature of the topic and the study, in-depth interviews and observation were the major tools used for data collection. The respondents can broadly be divided into demand-side and supply-side actors. Within the demand-side actors, there are the users and non-users. Separate questionnaires was developed for the different customer groups although core essence was kept similar. As for the supply-side actors, 3 sets of questionnaires was developed keeping in mind management level and operation level personnel, as well as manual emptiers.

The table below depicts the proposed tools to be developed for the respondents groups.

Table 3: Willingness to pay study

Users	Non-users		Semi-structured questionnaire
Senior management	Operational level	Manual emptiers	Checklist/Open ended questionnaire

The tools for conducting Conjoint analysis of mechanical emptying service was embedded with the semi-structured questionnaire. The overarching idea was to present the customer with multiple service attributes of the service, with each attribute to be broken down into multiple options. The customer was asked to select the best combination of options of each attribute and to mention the optimum price he/she would be willing to pay for it. Subsequently, some of the options of each attribute was tweaked and presented to the respondent again to find out change in respondents willingness to pay. Finally, customers would be presented the actual set of options (prevalent system in their city) for each attribute and again probed for their willingness to pay. The findings would be juxtaposed and a complete picture of the customers' willingness to pay would become more evident. However, it must be noted that before conducting this analysis both users and non-users were given basic orientation on the mechanical emptying services (more in the case of non-users), so that they have adequate idea about the service and do not appear lost while being queried.

1.6 SELECTION OF SAMPLE

The following table depicts the process utilised to reach the intended respondents.

Table 4: Willingness to pay study

Respondent Group	Selection Procedure
Customers (Users & Non-users)	• Talked with SNV regional staff to identify target population groups/clusters. • Talked with Municipality/City Corporation/CDC to collect list of users and then called them up to set up interview and visited their HHs. • For non-users, they were randomly selected from pre-divided areas/clusters.
Service providers (Senior management)	• Discussed with SNV regional staff to identify and locate service providers (especially private service providers) and called them up to set up interview and visited their office premises.
Service providers (Operational workforce)	• Asked senior management of service providers to introduce them and subsequently interview conducted with operational staff.
Informal private emptiers	• Discussed with SNV field staff to locate living quarters of informal private emptiers in each city and visited those places to talk with the emptiers.

1.7 STUDY LIMITATIONS

- Calculation of willingness to pay for emptying service was based on a lot of variables and psychoanalytic exploration. Thus, it is subject to change if one or more of the variables are changed or not realised as per assumption.
- The proposed tariff structures for each of the 3 cities depend on realisation of a lot of variables and assumptions made. Since the tariff structures were proposed based on customer's willingness to pay, it is prone to change based on change of WTP. The tariff structures are to be considered proposed only and finalisation will depend on further discussion with all the stakeholders and taking into account all the variables.
- The study team faced some challenges in identifying users of vacutug service since they were limited in numbers. Sometimes users were not in their homes and it was not possible to just replace that user from a neighbouring HHs, as was possible in the case of non-users. However, CPL tried to collect list of as many users as possible so that the quota for sampling could be met.

CHAPTER TWO

STUDY FINDINGS OF KHULNA **CITY CORPORATION**

The study findings in Khulna can be broadly divided into demand-side, that is to understand the perception and willingness to pay of customers of Khulna City Corporation (KCC) and the supply-side, that is to understand the state and service delivery mechanism of the service providers, both public and private. In Khulna City Corporation, vacutug-based mechanical service is provided by the KCC itself and also by Community Development Committees (CDC). CDC is a community organisation, that provides mechanical emptying services through 3 different clusters in KCC with a fleet of three trucks each having 1,000 litres capacity donated by UNDP.

2.1 DEMAND-SIDE ANALYSIS FOR EMPTYING SERVICE

2.1.1 Toilet System and Emptying Behaviour

Current Status of Household (HH) Toilet System

From the study findings of the Household (HH) interviews, it was seen that all of the HHs, irrespective of their economic status have access to toilet facilities. The most common form of faecal storage system was mostly pit system with covered slab and septic tank. Majority of the respondents had personal toilets; however, low and lower-middle income group of HHs such as in 'Peoples Colony' in city's Khalishpur area were seen sharing toilets. In these areas, community-based faecal storage tanks are mainly constructed and maintained by the community with the support of NGOs like '*Nobolok*'.

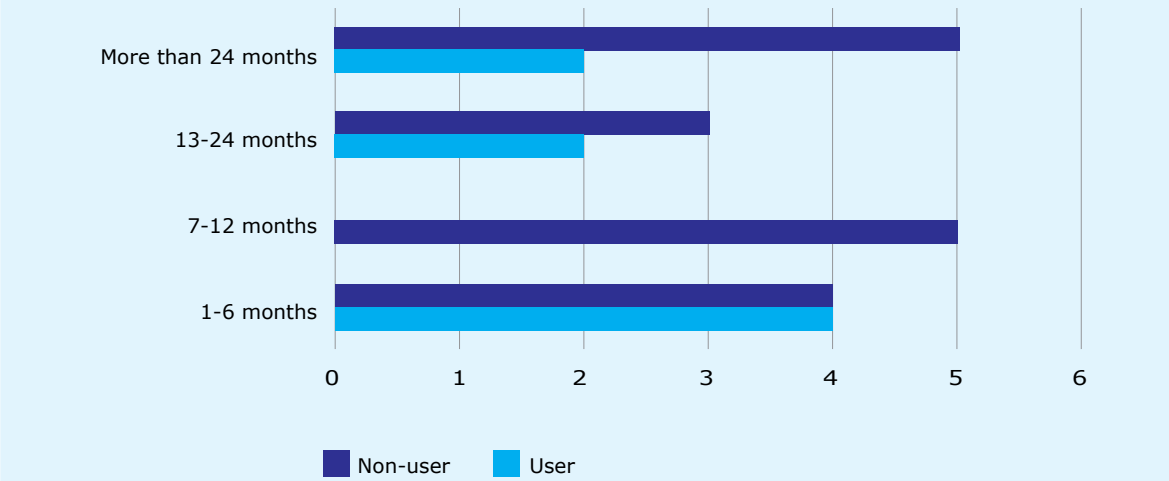
Another important observation from field findings was that around 60% of HHs had installed their faecal storage system (pit or septic tank) more than 10 years ago and could not remember the installation cost. From non-user respondents, only one third of them were able to give an accurate cost of building their pit/septic tank. Average cost of installation of pit was BDT 3,200 and septic tank was around BDT 15,000. Many of these septic tanks are not made of RCC or concrete rather made of brick wall with RCC bottom and slab. Supplementary tank for liquid sludge or soak well is absent in Khulna area due to comparatively high ground water level in that area. Hence, most of the households have outline or direct connection of their pit or septic tank with City Corporation's rain-water drain. Furthermore, only a few respondents had any idea of current rate of installing a standard septic tank as they do not have any plan to replace the existing system until they rebuild their house. However, households who have installed septic tank long ago are willing to spend BDT 37,500 on an average, to build septic tank if and when required in future. For pit installation, they are willing to pay around BDT 1,500. They have also said that it might be changed based on the market price of that time.

Emptying Behaviour of HHs

The study results generated some interesting findings on this aspect. It was seen that there is a general tendency of not cleaning/emptying pits or septic tanks proactively, rather HHs usually wait till the last moment, or only conduct emptying activities when faced with an overflow. In Khulna, a quarter of the user respondents and all of the non-users employed cleaning service only when the tank is full. This is mainly due to lack of will to spend money unless pressed to do so in case of FSM. This was prevalent for both non-poor and relatively poor HHs. Furthermore, emptying service usually is way down the list of priorities for the HHs. Thus, it has become a usual practice in the area to clean only when the tank is overflowing or bad smell is evident.

Five out of 13 respondents who used mechanical emptying service availed the service within the last 7-12 months, which suggests that vacutug-based mechanical emptying service is a relatively new phenomenon for the residents of Khulna city. On the contrary, many non-user respondents have not taken any emptying service yet as their faecal storage system has been built in the last 2 years or so and thus cleaning requirement did not arise for them. Another underlying reason for the decrease in need for cleaning could be the fact that many HHs have direct outflow connection to the city drains

Figure 3: Frequency of emptying behaviour comparison of users (13 respondents) and non-users (12 respondents)



to drain the liquid sludge. For non-users of mechanical service it was mentioned by most of them that they avail emptying service in a 5-10 years interval and first emptying happens only when they face any maintenance or clogging issue. Observation shows that pits get filled faster than septic tanks and pit users need more frequent cleaning than septic tank but the frequency depends on the size of the tank. In semi-urban areas, people tend to clean their tanks or pits in rainy season as soil cannot soak liquid sludge or water and drains get full in rainy season. But in core urban areas people usually take this service in dry or winter season. Approximately one-third of the respondents were from core urban setting, i. e., inside the main city.

Preferred Time of Emptying

Irrespective of mechanical or manual emptying, most of the HH respondents prefer night-time for the 'dirty work' to avoid being castigated by the neighbours. Clear majority of manual emptying customers prefer to do it at night, because they feel there is no other option and they do not want to draw the ire of disturbed neighbours. This is due to a strong stink is released into the air while pit is being cleaned and this stink can cause breathing problems in children, elderly, and sick people in surrounding areas where the cleaning is taking place. There is also a perception in the society that manual cleaning must only be done at night. However, those who mentioned day-time said so because it is easier to monitor the activities of the emptiers during the day and HHs also have some time to fully cover all traces of cleaning activity, after the emptiers have left. The figures found on the next page encapsulate the findings above:

Figure 4: Non-users' preferred time of cleaning (21 respondents)

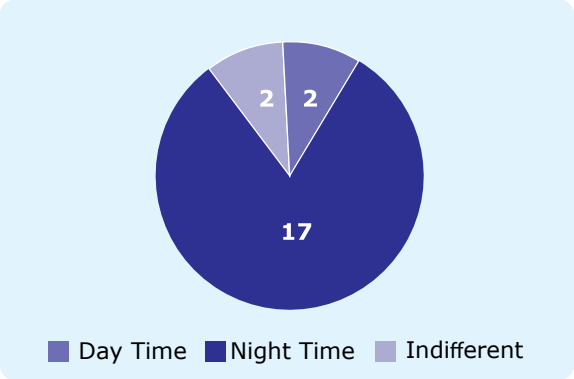
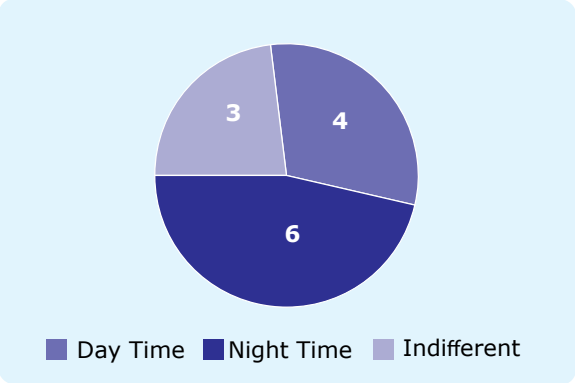


Figure 5: Users' preferred time of emptying (13 respondents)



2.1.2 Access and Availability of Service Availed

Application Process and Perception about the Process

Ease of application is an important deciding factor for availing a service. Thus, both user and non-user respondents were asked about their perception about the application process of the respective services they availed. Among the users, five of them availed KCC-run vacutug service.

Most of the user respondents (for both public and private) evaluated the application process as convenient and none of them mentioned any noticeable inconveniency that they faced while availing the service. This can mostly be attributed to the CDC[3]-run scheme, which is quite easy to apply by just calling the CDC cluster head. Community-based service providers such as Community Development Committee (CDC) actually provided the service much faster and conveniently. Customers can easily avail the service by calling the local CDC cluster leader near to their residing area.

Customers who availed manual service for emptying also expressed satisfaction about the process of reaching these manual emptiers. HHs usually contact the manual emptiers through several methods, such as direct phone call to the emptier, physically going to the emptiers' ghetto, or to their common gathering place. Sometimes the local plumber also connects the households to the manual emptiers. HHs usually collect phone numbers from neighbours or family members who have employed manual emptiers before or have made the reference about the emptier.

Time-lag between Service Application and Receipt

More than 50% of vacutug users mentioned that they received the service within 8-24 hours of application, which was mainly made possible by the CDC-run vacutug scheme. The CDC operated vehicles are smaller, but avoids bureaucracy when taking services. However, as per the respondents

[3]The CDC is a community-based organisation that was initiated as part of the Urban Partnership for Poverty Reduction Programme (UPPR) of UNDP. Each ward has a CDC with the main purpose to empower communities, particularly women, to find solutions for poverty issues in the urban areas they live in. In Khulna, there are three 1,000 litres Vacutugs that the CDCs can use and serve local communities effectively and promptly.

who used KCC service, they mentioned that KCC-run scheme can take about 24-48 hours on an average but can also extend to 3-4 days if the vacutug machine is undergoing repair or if there is a queue of requests. In case of long queue, KCC has to provide the service to the first applicant on the list and so on. In case of manual emptying service, all the respondents mentioned that they received the service within 8-24 hours of contacting the manual emptiers.

Reliance on the Service Provision

Majority users of vacutug-based mechanical emptying service mentioned that they would rely on availing this service even in the case of emergency. However, one glaring problem came to surface while discussing with the respondents. Vacutugs, however efficient and clean they might be, has one major flaw, i. e., the suction pipes cannot pull out the hardened sludge. Thus, HHs often have to employ a mix method of emptying, i. e., sucking up the liquid sludge and then calling up manual emptiers to get into the pit and clear up the hardened sludge. This is not only cumbersome but also costly as both mechanical and manual services are required in the end. The total cost in this case however depends on situation and bargaining with manual emptiers. This problem usually arises when HHs do not clean up sludge regularly, giving the sludge ample time to harden and solidify. Respondents who have employed manual emptying service before (14 non-users out of 21) said that they would prefer manual emptying in emergency situation as it is a tested service. Furthermore, in emergency situation the condition of the tanks is expected to be much worse, thus quick service is more important than any other attribute. Majority of the non-user respondents would choose manual in an emergency because according to them, mechanical emptying service takes considerably more time. There were seven non-users who never employed emptying service before.

2.1.3 Utility Analysis of Service Provision Based on Ranking Analysis

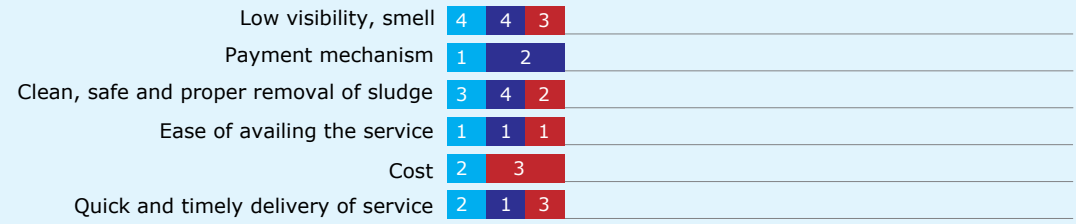
The overarching objective of this analysis was to gauge customers' perception of the various attributes of both mechanical and manual emptying service. A ranking-based matrix was used to dig out customer perception. The matrix has been embedded in the research tools (for users and non-users) to be found in the annex.

In the case of mechanical service, most users assigned smell-free removal of sludge as the most important factor that mattered to them followed closely by safe and proper removal of sludge. This is consistent with the major goal of introducing vacutug-based emptying service.

Interview of respondent in Khulna

However, users of manual emptying service ranked quick and timely delivery as the most appealing factor for availing the service. This is also consistent with the findings mentioned before that manual emptying service is usually delivered within 8-24 hours. Thus, respondents view quick and timely delivery of service as the top ranked attribute for the manual service provision model. This is not surprising since almost all the HHs seek emptying service only in emergency situation. The diagrams below (Figure 6 and 7) shed more light on the discussion above.

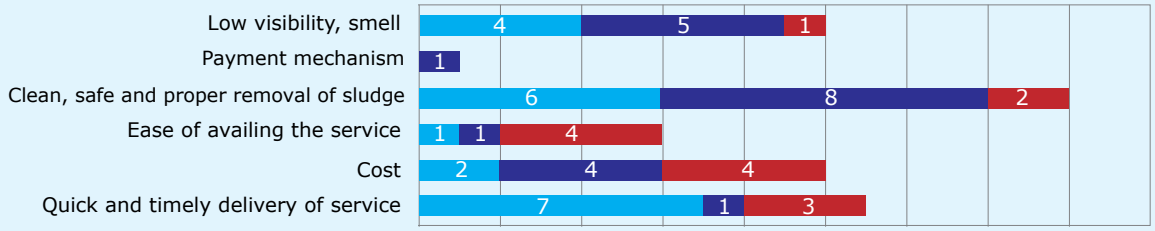
Figure 6: Ranking analysis of service attributes: Users (multiple responses of 13 respondents)



	Quick and timely delivery of service	Cost	Ease of availing the service	Clean, safe and proper removal of sludge	Payment mechanism	Low visibility, smell
1st Preferrence	2	2	1	3	1	4
2nd Preferrence	1		1	4	2	4
3rd Preferrence	3	3	1	2		3

1st Preferrence 2nd Preferrence 3rd Preferrence

Figure 7: Ranking analysis of service attributes: Non-users (multiple response 14 respondents)



	Quick and timely delivery of service	Cost	Ease of availing the service	Clean, safe and proper removal of sludge	Payment mechanism	Low visibility, smell
Ranked 1st	7	2	1	6		4
Ranked 2nd	1	4	1	8	1	5
Ranked 3rd	3	4	4	2		1

Ranked 1st Ranked 2nd Ranked 3rd

Around three-fourth of the users mentioned that they are satisfied with the service delivery performance of mechanical emptying service. A few respondents, mainly recipients of KCC-run service expressed dissatisfaction with the service delivery, stemming from not receiving the service within 2 days as they had hoped and that they were also facing an overflow situation.

In the case of manual emptying, satisfaction with the overall aspects of the service was a bit lower compared to mechanical service and some respondents mentioned that the smell was really obnoxious and some of their neighbours complained to them, even though emptying was conducted at night.

2.1.4 Underlying Social Norms Influencing Emptying Behaviour

Social norms play a crucial role in shaping behavioural setup of an individual. Therefore, a behavioural analysis it was crucial to take into consideration the social and cultural norms that influences a person's upbringing.

From field observation it was seen that most users of vacutug service users had employed manual emptying service at least once, before shifting to mechanical emptying service. The reason they did not employ the vacutug was due to lack of awareness, misconception that the application process might be very difficult (as it is a government organisation and many ordinary citizens tend to stay away from bureaucratic hassles) and that the cost of mechanical emptying could be much higher than the emptying by informal sweepers.

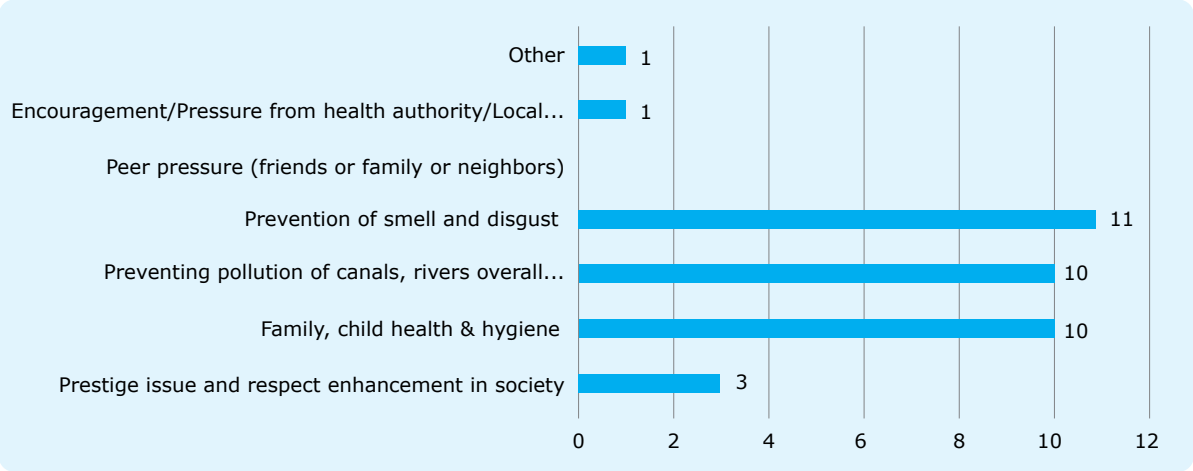
However, after employing mechanical emptying, most of them viewed manual emptying process unfavourably and have no plans to employ manual emptying service in the future. Even two-third users of manual emptying service also did not speak highly about manual emptying service mainly due to the spread of bad smell during emptying and the improper disposal of the waste.

Interview in Progress in Khulna

However, manual emptying service do has its merits. Firstly, it has greater coverage than mechanical service both for poor or non-poor demography. Manual emptiers can access pits/tanks in deep slums or localities where vacutug trucks or pipes cannot reach. Manual emptiers can also clean out rock-solid waste at the bottom of the pit/tank. On the contrary mechanical cleaning is limited to certain localities within KCC, while trucks cannot reach to the densely crowded areas with narrow and far-away lanes.

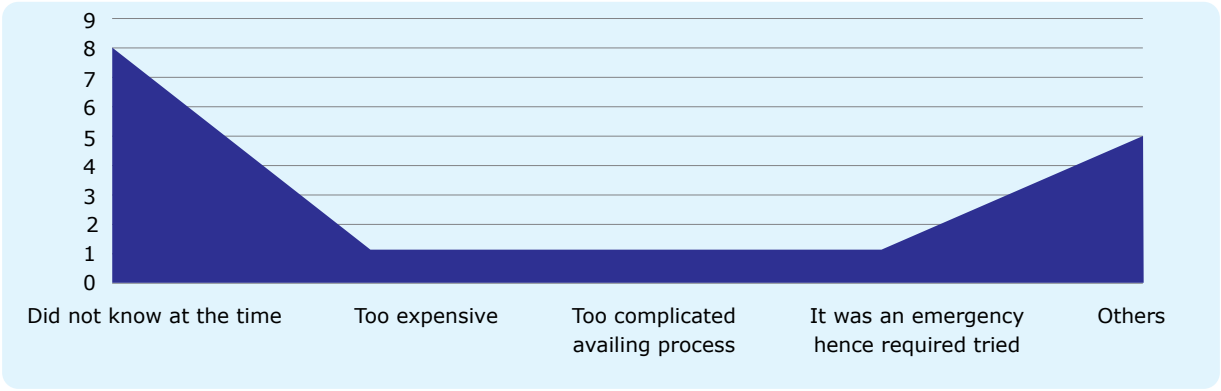
Users of vacutug-based mechanical emptying service were also probed on why they chose mechanical emptying over manual emptying. Their responses are organised in the chart below:

Figure 8: Users' reasons behind opting for mechanical service over manual (multiple responses of 13 respondents)



From the figure above, it is evident that prevention of bad smell and disgust is the most important reason behind employing mechanical service, followed closely by prevention of pollution of waterways and other associated ills. Family health and hygiene was also termed as an important factor for their decision to shift to mechanical emptying service. Subsequently, respondents who did not employ mechanical emptying service, therefore, the non-users were asked about why they did not employ mechanical emptying mechanism during their last emptying. The following figure captures their views:

Figure 9: Reasons for non-users' not employing mechanical emptying during last requirement (14 respondents)



Two reasons were mostly stated by the respondents: poor service quality (incomplete cleaning) delivered to past users of vacutug and the lack of awareness of the vacutug service when the need for cleaning was required. A section of the non-users placed their trust on the traditional cleaning method during an emergency. Another section thought the mechanical service could be costlier than manual cleaning. The issue of incomplete cleaning has been discussed before and the inability of the vacutug machine to remove hardened sludge put off many non-users.

When the non-users were asked if there was any reason that might discourage them from employing vacutug in the future, more than half of the respondents mentioned that they had no knowledge of where to avail the service. Lack of promotion of the service is widely believed for this lack of awareness among many respondents. Relatively poor respondents also expressed concern about the cost and they think the service might be too expensive for them.

Stigma Associated with Emptying among Users and Non-users

Emptying of pit/septic tanks was viewed as a necessity and part of life by all the respondents, just like going to the toilet every day. When the pit or tank is full or overflowed the emphasis lays on quick and efficient cleaning of the situation rather than stigma. However, those who employed manual emptying, two-third of them prefered night-time to complete the "dirty" work quietly.

For mechanical emptying, users did not have much qualms about employing it in the day time since the process nullifies the major concern about emptying, i. e., spread of bad smell and subsequent discomfort caused to everyone nearby. Service providers both manual and mechanical, however, indicated social stigma due to association and Muslim drivers are somewhat reluctant to operate vacutug trucks even as drivers. Manual emptiers mentioned about getting discriminatory behaviour by even the people who employ them and also by the general society. Basically they live separately in their own ghettos away from the rest of the society and have separate shops for buying HH items. Their children also face some discrimination especially when they go to school with other children.

Awareness about Rules and Regulations

There is limited awareness of consumers as to any rules regarding timely removal and safe disposal of sludge. Consequently, consumers have little idea as to whether any rules are enforced or not. Enforcement of rules regarding safe disposal of sludge in designated areas is weak.

Some of the users are aware that there are certain guidelines and regulations regarding sanitation, which is only applicable during construction. In colonies, designated for both government and private service holders, no approval is needed. The employees generally inform the management regarding any changes in the toilet whether it's about sludge removal or renovation.

Competing Priorities

When there is no any emergency regarding overflow situation, people usually are not keen on spending money for sludge removal proactively. When it comes to spending money on maintenance and renovation, people prioritise spending on other fixed assets of their household, which has more regular use by the people of the HH. If for some reason they save some money, priority is given to acquiring fixed assets, or assets that are likely to generate revenue. Ensuring good education for the children is also a priority. However, CPL did not rank the list of priorities but took a general view of their mindset.

2.1.5 Pricing Structure and Perception about Pricing

From field observation, it was seen that most respondents did not show a good understanding of the cost breakdown as most paid the total amount at once and cannot recall what amount was attributed to which head. The study found that users of KCC operated vacutug service had to fill up an application form and pay the down payment by pay-order. Upon receiving the service, an estimate of carrying cost and total expenditure is generated. Different sizes of the pit or safety tank required different number of carrying cost and total cost depended on the number of trips. Contrastingly, users who employ emptying service from CDC pay the total charge (BDT 1,000 for each trip) after availing the service.

For manual users the cost structure is not defined. Depending upon the size of the pit/tank the informal emptiers make their demand. Manual emptying customers spent on average BDT 1,944 for employing manual service in recent past. Based on the type of tank, on an average emptying cost for pit latrine with covered slab was BDT 950 and septic tank was BDT 2,108.

Currently, KCC has 2 large vacutug machines at their disposal with suction capacity of 5,000 litres at one go. Whereas the CDC has 3 small vacutug machines, each with suction capacity of 1,000 litres at one go. The table below summarises the detailed cost structure for availing the various service options in KCC. The cost structure has been prepared after collating data from the service providers.

Table 5: Tariff structure for emptying service

Particulars	KCC Operated Vacutug	CDC Operated Vacutug	Manual Emptiers
Application Process	Filling application form and submitting to Conservancy department	Calling local team leader of CDC	Calling directly or through middlemen
Fixed Cost	BDT 2,500 + (15% VAT) + BDT 10 ticket + BDT 30 pay-order fee. However, customers have to pay around BDT 800-1,000 to the emptiers who accompany the vehicles	N/A	Not fixed but based on pit size and negotiation • For small pit BDT 1,500 • For septic tank BDT 4,000–6,000
Variable Cost	Same rate for each subsequent trip as fixed cost	BDT 1,000 per trip or BDT 1/ litre	Kerosene and other entertainment cost
Payment Method	Pay-order (earlier they used to take cash)	Cash	Cash

Perception of Respondents on Tariff

More than half of the vacutug users were not satisfied with the service charge of the service and termed it a bit costly. It is because vacutug cannot always get the job done fully leaving the hard sludge uncleaned, therefore, users have no options but to call manual emptiers and pay more for the same service. Sometimes the emptiers ask for tips or extra money after a cleaning job or if there is additional cleaning required, HHs have to pay extra to get the job done manually with the emptiers.

In case of manual emptying, majority of the users of manual emptying service are happy with the tariff charged. Even though the stink became a nuisance for the surrounding community, the pit/tank was cleaned thoroughly, resulting in satisfied clients as they found the value for their money.

Paying Behaviour in case of Emergency

Respondents (both user and non-users) irrespective of income status clearly stated that during an emergency cleaning of the pit/tank is the primary objective. Users from both relatively poor and non-poor groups opined that they are willing to pay more in case of an emergency. They are willing to pay 15% more if they are faced with an overflowing or leakage in the tank.

On the other hand, manual emptying service users unanimously said that they would pay extra. This is due to the fact that manual emptying is way cheaper than mechanical. They were willing to pay around 34% more on an average.

Perception of Payment Method and Modality

When asked about which payment modality they preferred, both users and non-users overwhelmingly preferred one-shot payments and in cash. Many found paying regular instalment every month as an unwanted burden on their income. Respondents found paying in cash the most convenient as many dislike going to the bank as it is a hassle and consumes time from their working day.

Perception about Paying Annual Taxes for FSM

Respondents were asked whether they would be interested to pay FSM tax along with the periodic payments they make such as holding tax. In response, all the users and almost three-fourth of the non-users mentioned that they would be willing to pay FSM tax annually. Users' average desire to pay annual tax was BDT 310 per year. Whereas, non-users' average willingness to pay annual tax amounted to BDT 400 per year. Among the consenting respondents in KCC, relatively poor intended to pay annually BDT 200 and non-poor interviewees were willing to pay BDT 390 annually for the FSM service. Respondents who are unwilling to pay taxes are doubtful about the effectiveness of that charge, rather they think instant payment would be more efficient system to get service in required time.

2.1.6 Willingness to Pay for FSM

A major focus of this study is to find out the willingness to pay (WTP) for emptying service, more specifically for safe emptying service using vacutug machines. As mentioned before, Choice-based Conjoint analysis technique was used to extract customers' willingness to pay for availing the service, in consideration of what he/she is getting in return. The various aspects of the service attributes such as service time-lag, preferred service receiving time, preferred mode of payment etc., were presented to the respondents and their preference were noted. Additionally, respondents were also queried on how much they would be willing to pay for the actual service provision model that exists in their respective city. Both users and non-users of vacutug service were subjected to the same questions.

The table below captures the results garnered from the previous-mentioned investigation:

Table 6: Preferred service provision elements of both users' and non-users' (in % of respondents for each group)

	User	Non-user
Preferred service time-Lag		
12 hours	61%	29%
24 hours	31%	57%
48 hours	8%	14%
Preferred time of receiving the service		
Day	31%	13%
Night	46%	79%
Indifferent	23%	8%
Preferred communication method		
Physical application	15%	
Apply through mobile/Phone	77%	90%
Service booth/Sub-centres	8%	10%
Preferred mode of payment		
One shot	69%	81%
Installment	23%	14%
Others	8%	5%
Preferred payment method		
Cash	92%	100%
Bank draft	8%	--

From the table above, certain inferences can be made. It can be inferred that majority of users and non-users expect the service to be delivered within 24 hours. However, in the time of receiving the service, some variation is noticed in the responses of both users and non-users. Since vacutugs are available in the day only and the fact that it prevents the bad smell from permeating the surrounding air, users are less skeptical about availing the service at day-time. Though there is still a strong preference of user group respondents (46%) to avail the vacutug service at night if possible. In the case of application process to avail the service, majority of users and non-users respondents mentioned about their preference of using mobile phones to communicate with the service provider. Most of them would like to avoid the hassle of going to an office or living quarter of the service provider (manual emptier's colony) to avail the service. Most respondents, user and non-user groups, also mentioned that they would ideally like to make an one time payment in cash once the service has been rendered, rather than burden themselves over a longer period of time.

Subsequently, both users and non-users were briefed about the service provision model for vacutug-based emptying service that exists in their city and told to express their interest in availing the service and comfortable price range. The table below depicts the WTP of respondents based on their preferred service model, i. e., if they were paying for their preferred service model and also for the actual service provision model that exists in their city.

Table 7: Willingness to pay of respondents by category

Respondent type	Average WTP for preferred service provision	Average WTP for actual service provision
User	BDT 1,939	BDT 1,545
Non-user	BDT 2,038	BDT 1,742
Total average (user+non-user)	BDT 2,000	BDT 1,622
Relatively poor	BDT 1,735	BDT 1,390
Non-poor	BDT 2,378	BDT 1,985
Pit user	BDT 1,000	BDT 845
Septic tank user	BDT 2,460	BDT 2,000

Note:

i. Preferred service refers to the combination of the total service provision that the respondents preferred
ii. Actual service refers to the service provision model available in their respective CC/ Municipality
iii. The monetary figures denote total willingness to pay for service provision (not per trip or capacity of emptying)

From the table above, it is seen that for users, average willingness to pay for FSM according to their preferred model is near about BDT 2,000, whereas for the existing service provision model in KCC, the willingness to pay drops to BDT 1,545. Taking into account the opinion of the users, it seems, there is room for improvement in the existing vacutug service model in Khulna. The same type of difference is also evident in the case of non-users. It is interesting to see that non-users also showed interest in paying similar cost for their preferred service model, suggesting that these non-users may uptake mechanical emptying service the next time they need emptying. However, non-poor HHs have noticeably higher payment capacity than poor HHs. From the table above, it can also be seen that pit users have much less WTP than septic tank users, which is not surprising considering that pit users usually pay BDT 500–1,000 for emptying their pits.

2.2 ANALYSIS OF SERVICE PROVISION FOR EMPTYING SERVICE

In Khulna City Corporation (KCC), there are broadly 3 types of service providers for faecal sludge management. KCC itself is a major service provider with their fleet of 2 large vacutugs and trailer type vehicles operated by manual emptiers under their payroll. Besides, CDC operated vacutug service is also operating in the outskirts of the city. There is also the bevy of manual emptiers belonging to the Harijan Community who provide emptying service through generations. To obtain information about the service provision models, Key Informant Interviews (KIIs) were conducted with both senior and operational level officials of both KCC and CDC and also with traditional manual emptiers.

2.2.1 Vacutug-based Mechanical Emptying Service

Service Provision Model

A vacutug machine with truck

To avail the KCC-run vacutug service, the client needs to go to the KCC office to fill out a form. The application form contains the information about the tank/pit size, machine to pit/tank distance and the road size in front of the house. The applicant also has to submit pay-order issued from a local bank in favour of KCC. Then, a supervisor from the Conservancy Department of KCC will visit the home to validate all the information of the application form within 24 hours. After the supervisor gives the go ahead, the vacutug truck should reach the client's home within 48 hours (within 72 hours of the pay-order). However, during high number of applications, the service delivery might take more time than usual. The tariff structure for the vacutug service has already been presented in section 1.5. KCC has two vacutugs of 5,000 litres capacity each, out of which presently one is functional and the other one has been out of order for a while. Currently, there are 5-6 calls a month, which is quite low and not enough to reach to break-even. KCC also employs a bogey (cart) pulled by a truck. There are 3 carts pulled by a truck, accompanied by manual emptiers working for KCC, each of them having storage capacity of 700 Litres. Once the sludge is pulled out from the pit/septic tank, it is dumped into the carts and then transported to the designated dumping grounds. The system is a slight upgrade from the informal manual emptiers with proper dumping of sludge being the main plus point. The table below depicts the approximate revenue generated by the KCC from provision of emptying service.

Table 8: Willingness to pay study

Particulars	Rate (BDT)	Number of trip/Year (Approximate)*	Revenue (BDT)
Vacutug charge for each trip	2,500	65	162,500
Bogey (Cart) for each trip	600	72	43,200
Application form/Ticket	10	137	1,370
Total			**207,070**
15% VAT directly goes to Govt. account			
Emptiers accompanying the vehicles get the full amount of emptying charge of BDT 800-1,000 for each trip of vacutug and BDT 1,500 for each trip of bogey			
***10-12 calls per month. 5 to 6 calls for the vacutug and the rest are for the bogey**			

The table below depicts the total cost of operating emptying service in KCC:

Table 9: Cost of emptying service provision - KCC

Particular	Cost (BDT)/Year*
Driver's salary	216,000
Two emptiers' salary	252,000
Fuel cost	80,000
Maintenance cost	40,000
Total	**588,000 (approx.)**

The driver of the KCC vacutug truck usually belongs to the Harijan community and he is a key person of the team since he hires 2-3 people to accompany him while they are going to a cleaning mission. The hired people are sweepers belonging to the same community who are not permanent employees of KCC. They are paid according to assignment they complete and receive around BDT 800–1,000 for each cleaning mission.

In case of availing the CDC operated service, customers do not need to apply formally and can call directly to the CDC cluster leaders or vacutug truck drivers or helpers for emptying service. Sometimes KCC officials link customers with CDC if they require small capacity trucks or if they are too overburdened to meet customer requests within a reasonable amount of time. The CDC charges flat tariff of BDT 1,000 for each trip for 1,000-litre capacity trucks. However, if someone requires more than 4 trips, cost from 5th trip comes down to BDT 800 per trip. The CDC cost structure per trip is presented in the follofollowing table:

Table 10: Cost of service provision for the CDC Vacutug service (per trip)

Particulars	Cost (BDT)
Driver's wage	25% of each trip
Helpers' wage (2 helpers in each trip)	35% of each trip
Fuel cost	200-300 per trip
Conveyance	50-100
Total cost per trip	**800-900**

From the table above, it is clearly seen that the total cost per trip is close to the total revenue per trip. The initiative is yet to be made highly profitable and operating at a marginal profit. From discussion with senior management and operational force of the CDC, it was ascertained that currently they are receiving 20-25 calls per week during rainy season and 5-8 calls per week in the remaining 7/8 months of the year. However, CDCs do not allocate any money for depreciation. Thus, if a vehicle breaks down after 2-3 years, it may not have enough money in their coffers to finance a new machine.

Problems in Service Delivery

KIIs with relevant officials of both KCC and CDC revealed some problems or bottlenecks affecting the service quality of the vacutug service. The constraints are highlighted in the table next page:

Table 11: Constraint analysis of Vacutug service

Constraint Analysis of Vacutug-based Mechanical Emptying Service	
KCC-operated Vacutug Scheme	CDC-operated Vacutug Scheme
• Social stigma - Muslim employees do not want to work as drivers or emptiers for the fear of being ostracized in the society. • Lack of drivers - The KCC has problems in finding well-trained drivers and retaining drivers for their vacutug fleet. • Lack of vehicles - As per officials of the Conservancy Department of KCC, there is a need for at least 3-5 small trucks with a capacity of 1,000 & 2,000 litres each). These trucks will enable them to provide service to customers within 24 hours without any queuing. • Trucks do not have access to some areas firstly due to congested roads and secondly due to the location of some pits/ tanks, which are quite far from the roads. • Sludge management – Although the sludge is disposed in a designated trenching ground, it is not fully safe. There is an immediate need for a treatment plant. • There is no dedicated wing for FSM in KCC organogram. Conservancy Department under KCC is managing the operation alongside many other activities. A dedicated FSM unit needs to be created for smooth delivery of service. • Presently KCC is not receiving enough calls to achieve breakeven.	• Most of the HH make the outlet of pit/tank with sewerage/drainage line to bypass the liquid sludge. It prompts solid waste to get hardened at the bottom of the tank. Vacutug cannot remove this hard waste. • They have to employ manual system like using bamboo and more water to clean the solid/semi-solid waste. Often external water source is unavailable adjacent to the pit/ tank, which makes the cleaning work difficult. • Narrow road is a major challenge to deliver service along with low suction capacity of machine. Moreover, frequent brekdowns of machine and trucks and unavailability of spare parts are major concerns.

Profiling of Customers Availing Vacutug Service

According to the officials of Khulna City Corporation (KCC) both the poor and non-poor residents ask for vacutug services. User numbers are increasing gradually due to the general increase in awareness of clean and hygienic removal of sludge. According to the CDC senior management and study findings as well, both the poor and non-poor ask for vacutug services as there is a lack of own sludge dumping place. Clean hygienic service is also a consideration. It is a general perception of CDC senior management and emptiers that household owners are more aware than before about safe emptying. Moreover, they have lack of dumping space. Therefore, they are getting more interested in availing mechanical vacutug than manual emptying. In semi urban/rural areas they receive around 20 calls in a month during rainy season and around 5 calls a month during dry season.

KCC officials also mentioned that the most common reason for residents not availing vacutug service is the lack of awareness. The other reason is difficulty of reaching some of the locations. In many cases narrow roads and closely-knit buildings prevent vacutug trucks to reach the pits/tanks at the required distance. In some instances the manual emptiers influence the households to employ them instead of coming to KCC. They usually try to give an impression that the service is very costly plus service quality would not be satisfactory. CDC staff mentioned that the major reason why non-users are not availing mechanical or vacutug service is lack of awareness coupled with slow filling of pits/ tanks due to the connection with rain-water drains. Narrow road communication is another main reason behind non-users' reluctance to avail mechanical service.

Perception of Service Providers about Tariff Structure

The officials and operational force of KCC consider the tariff as reasonable. However, there are plans to bring down prices further and deregularise the service of private enterprises to make the tariff more competitive. It is believed this will open up the market to private sector, which will ensure better quality of service. Currently the service is not subsidised. The management of KCC feels that if subsidy is given to the poor or slum dwellers only, some affluent residents might try to avail the opportunity through unfair means and exploit the system.

The CDC higher authority and operational force consider the price structure to be reasonable. However, they opined that the current tariff is bit of a stretch for relatively poor people. A good portion of revenue earned from vacutug service goes to the operational cost e. g., wage and fuel. Previously CDC provided staff salary from their own fund received from donor-led projects therefore, could afford to charge subsidised cost, which was BDT 500 per trip. Now they are emphasising on demand-driven approach and have no plans to subsidise the service any longer.

Initiatives for Service Promotion

The KCC has made some efforts to popularise the vacutug service among the city dwellers. Currently there is a promotional campaign being undertaken by KCC, with a view to increase awareness of cleanliness and good hygiene practices. The activities range from but not limited to holding regular meetings in each ward, scroll advertisement through local cable TV operators during airing of movies, and sensitisation through mosque miking. However, KCC officials mentioned that although creating awareness among 1.5 million people is a difficult task, SNV activities have already helped in creating awareness among the residents.

In case of CDC, members often conduct promotional campaigns to increase awareness about vacutug service through meetings in each ward and distributing promotional leaflets. However, these activities are not as regular as it should be since CDC does not have enough staff or budget to sustain such promotional activities.

Future Plans for Improvement in Service Quality, Delivery and Recommendations from Service Providers

As mentioned before, KCC has plans to encourage private sector actors in the FSM market. The overarching idea is that entry of private sector actors would open up the market and increase price competitiveness. They are already seeking out prospective private sector players who can deliver the service effectively and in a cost efficient manner. KCC will then provide sensitisation and training if required to the selected entities. KCC officials also mentioned the need for smaller capacity trucks (1,000 litres) so that they can service the entire community effectively. However, the number of trucks required will depend on detailed feasibility analysis.

In order to ensure that the service is affordable to all segments of the city, KCC officials also suggested different tariff rates for poor and non-poor segments. In way of relatively well-off people sharing more burden of the service could make it affordable to the poorer segments of the city. However, such move might be unpopular and they would need to conduct more feasibility before launching such an initiative.

KCC officials also mentioned that there is no dedicated wing for FSM service provision in the hierarchy of KCC and FSM wing operates under Conservancy wing, which has a lot of other responsibilities. A dedicated wing for FSM in the KCC organogram would make service provision smoother. Furthermore, a proper treatment plant for sludge management would be beneficial for all (both environmentally and economically) as currently they are just dumping sludge in trenching grounds. Finally, the KCC officials also stressed the need for checking and stopping the illegal sewerage connections that goes directly to the drains and canals. In order to raise awareness about these issues, massive awareness campaign is needed especially targeting schools and mosques. According to KCC officials, development organisations such as SNV should come forward to facilitate such initiatiative.

On the other hand, CDC-supported operational force or emptier teams are instructed to dump sludge in selected dumping ground maintained by City Corporation but sometimes they dispose sludge in any convenient place like barren field or canal to save time. To solve this problem, SNV has facilitated a partnership between KCC and CDC to construct mobile sludge transfer station.

2.2.2 Informal Emptying Service by Manual Emptiers

KCC has around 120-150 manual emptiers engaged in all types of cleaning work starting from faecal sludge to cleaning drains to working in hospitals. There are 3 large Harijan ghettos in the city's Sonadanga and Doulotpur areas. They have been doing the "dirty" work for generations and they are often ostracised by the society and are not allowed to freely mix with the general population. They face severe discrimination in the society.

Box 2: Emptiers in Khulna

According to informal emptiers, households seek their service only when pits/tanks are overflowed with faecal sludge. There is little to no proactive cleaning of the faecal pits/ tanks by the building owners. Emptiers also noted that January to March is the peak season for them as there are more demand from households to clean their pits or tanks. Furthermore, they also mentioned that middle to upper income group make the biggest chunk of informal emptying service consumers.

An emptier's colony in Khulna

Service Provision Model of Manual Emptiers

Informal emptiers are usually contacted in-person if the customers do not have their contact phone numbers. That means travelling to Harijon colonies in Khulna City Corporation area where majority of the emptiers live. If a customer has the contact phone number of an emptier, he/she prefers contacting them by phone. The emptiers can get to their work of cleaning within 12–24 hours after the contracting. Unfortunately, no safety gear is used by the emptiers and they use basic tools such as bucket and spade to clean the sludge. During cleaning, they usually come to direct bodily contact with the sludge. It is quite harmful for their health but they do not seem to care much about the risks.

Informal emptiers prefer to work at night, starting from around 9 pm at night with a taregt of finishing before dawn. They think this is the best time to work as during the day they often face objections from neighbours due to the spread of bad smell.

For informal/manual emptiers the revenue model depends on a variety of factors. They usually make their demand based on the size of the pit/tank. Generally, for a small pit, they charge around BDT 1,500. However, for septic tank clearance, their charge is around BDT 4,000-6,000. This excludes costs of additives and other materials, which are usually borne by the customer. They also receive around BDT 500-1,000 taka as tips for a satisfactory job.

The table below depicts the cost to the manual emptiers for each cleaning endeavor:

Table 12: Cost of service provision - manual emptiers

Particular	Cost (BDT)
Van	100
Drums/Buckets	100
Snacks	200
Alcohol/Cigarettes	500
Total	**1,000**

Depending on the volume of the work, the emptier also takes in 1-2 aides for the cleaning work. The drum or bucket is washed after usage and used multiple times. The aides are usually other family members or acquaintances living in the same colony. They receive on an average 2 calls per week from customers. For a number of reasons, manual/informal emptiers are still sought after in KCC. Firstly, they can access almost any pit or tank unlike the vacutug trucks. Almost all residents are aware of the availability of the informal emptiers in town. Contratingly, vacutug service has low awareness among the residents.

Perception about Mechanical Service and Scope of Integration

The emptiers do not feel immediately threatened by the arrival of the vacutug service because some of the emptiers have shown interest to get integrated with the vacutug service, whereas some are forecasting that the demand for vacutug service might taper off due to incomplete service quality (remains of hard sludge at the bottom of the pit/tank) and inability to meet customer demands promptly. However, they mostly had good things to say about the service, which is captured in the table below:

Table 13: Pros and cons of mechanical service according to manual emptiers

Pros	Cons
• There is no need to carry the sludge manually or using hands. No bodily contact with sludge is required • No stink is spread while cleaning • No health hazards • The sludge can be thrown safely at designated places	• No accessibility to all roads and HHs • Cannot provide employment opportunities to all informal emptiers

It is worth mentioning that the informal emptiers interviewed for this study showed strong willingness to move to the mechanical emptying system. They were also enthusiastic about becoming entrepreneurs themselves if given ample startup support such as soft loans and training to handle the vacutug machine. They were also positive about wearing protective gears if they got the chance to operate the vacutug. According to the emptiers, shifting to mechanical emptying service will increase their social status and benefit them financially too.

2.3 RECOMMENDATIONS FOR EFFICIENT FSM VALUE CHAIN

2.3.1 Service Quality Improvement

- Utilise smaller capacity vacutugs alongside 5,000 litre capacity truck. The CDC business volume points to a preference for the smaller trucks. Smaller trucks can also reach hard to reach more efficiently than larger trucks.
- Reduce time-lag in service delivery and bring it down to 24 hours. This might be achieved by procuring smaller capacity vacutugs, which are more accessible to narrow roads and congested places. The tariff structure and revenue model after incorporating the new trucks has been shown in the next section.

- Accept cash payment along with bank draft to ease the application process. Furthermore, introducing online payment and mobile banking will also expedite the payment process.
- Orientation for the vacutug operational team of drivers and emptiers so that they do not ask for extra money after each assignment.
- Include FSM tax with regular tax that households pay. Households showed willingness to pay annual taxes for FSM, which is encouraging. With the revenue from tax, KCC may improve their service delivery and use the money for regular maintenance of their vacutug fleet.
- Establish dedicated wing for FSM in the organogram of KCC for effective service delivery.
- Build a treatment plant for waste management/recycling to ensure proper disposal of sludge and less harm to the environment.
- Establish one-stop call centre to process customer calls promptly.
- Launch awareness campaigns to increase awareness among people. Mosques and schools could be trageted for reaching large number of people. Local CBOs and NGOs may be involved for this endeavor.

2.3.2 Tariff Structure

The tariff structure may need revision since more than half of vacutug users are not satisfied with the pricing. Average willingness to pay is around BDT 2,000 (for both users and non-users), non-poor households had an willingness to pay BDT 2,378, whereas relatively poor households had willingness to pay BDT 1,738. However, as seen from previous sections, the cost for a customer of availing vacutug service per trip amounts to around BDT 4,000/trip for KCC-operated vacutug machine with capacity of 5,000 litres.

The table below depicts the proposed tariff structure that could be ideal for KCC to adopt. This will not only ensure breakeven but also enable them to service greater number of customers promptly.

Table 14: Proposed tariff structure for KCC

Particulars	Truck capacity		
	5,000 litres	2,000 litres	1,000 Litres
Revenue Details			
Trips per year	400	600	900
Average tariff per trip (excluding VAT)	• BDT 1,800 for septic tank • Should not service pit	• BDT 1,200 for septic tank • BDT 500-700 for pit	• BDT 900 for septic tank • BDT 500-700 for pit
Total revenue	BDT 720,000	BDT 720,000	BDT 720,000
Grand total revenue		BDT 2,250,000	
Cost details			

Driver (3x1)	BDT 216,000	BDT 216,000	BDT 216,000
Emptiers (3x2)	BDT 252,000	BDT 252,000	BDT 252,000
Fuel cost	BDT 160,000	BDT 240,000	BDT 270,000
Maintenance cost	BDT 50,000	BDT 30,000	BDT 20,000
Grand total cost		**BDT 2,174,000**	

Assumptions:

i. Fuel cost assumed to be BDT 400 per round trip for 5,000 and 2,000 litre and BDT 300 per round trip for 1,000 litre truck
ii. It is assumed that there will be multiple trips from each call especially for 2,000 litre and 1,000 litre truck
iii. The charge for pit should be determined based on distance and fuel cost

From the table above, it can be seen that breakeven can be achieved with the increase of fleet size and number of trips. The tariff for the 5,000 litre vacutug could be brought down to BDT 1,800 + VAT to align with the willingness to pay of customers. The tariff structure for the other smaller trucks should also be kept at a reasonable rate as depicted in the table. The focus should be to increase the volume of calls through awareness building and promotional activities. The bogey system of emptying should also be replaced gradually by the vacutugs. The proposed tariff rate should be kept same for both poor and non-poor households, since it has been reduced from previous rates and the proposed fee for pit emptying is quite low and affordable by the poor segments of the city. Currently, there is no urgent need to propose another rate for the poor but a lump-sum discount (20-30%) on the total amount can be given for a period of 6-9 months, on trial basis.

The tariff structure for the CDC-operated vacutug scheme should be continued since it is functioning efficiently at breakeven, without any notable need for loss absorption. Households expressed relative satisfaction with CDC vacutug operation in terms of price and service delivery. However, the tariff may be increased by 10-20% per year, so that CDC can generate enough revenue to account for depreciation of the vehicles.

2.3.3 Scope for Privatisation

There is good coordination between KCC and CDC. The CDC is operating their service without much interference from KCC. The latter does divert some customers towards them. From discussion with KCC Conservancy officials, it was ascertained that in the long run they have plans to allow private sector to run vacutug service with minimal supervision from KCC. However, the officials are still unsure of the extent to which private sector would operate in this area and improve the service delivery at an acceptable price range.

2.3.4 Roles and Responsibilities of Stakeholders

One of the main reasons for the failure of FSM systems is the vague delegation of responsibilities. Overlapping in roles and lack of incentives for efficient operation also contributed to this. This situation frequently occurs where an incomplete institutional framework exists. It results into a lack of accountability and disagreements between stakeholders. Since the entire service chain is

interlinked, each aspect influences another and it is essential that the roles and responsibilities are clearly defined. Proper coordination of the links in each step of the chain is imperative to ensure a successful FSM system. The distribution of the responsibilities among the stakeholders should be decided taking into account the intrinsic strengths and weaknesses of each stakeholder involved in the service chain. Incremental improvements can be facilitated either through capacity building or reorganisation of different stakeholders. To make the FSM value chain more effective, the table below depicts the proposed roles and responsibilities of each of the stakeholders:

Table 15: Potential roles of different stakeholders in FSM value chain

Stakeholders	Laws	Coordination	Collection and Transport	Treatment	Resource Recovery	Enforcement	Training and Information	Monitoring
Ministries	✓	✓				✓	✓	✓
City Corporation/ Municipality		✓	✓	✓	✓	✓	✓	✓
Law Enforcers						✓		
Pvt. Companies			✓	✓	✓			
Associations/CBOs		✓	✓		✓		✓	
NGOs		✓					✓	✓

The table below describes the possible advantages and disadvantages of the stakeholders:

Table 16: Comparative advantages and disadvantages of various service providers

Stakeholders	Advantages	Drawbacks	Needs
City Corporation/ Municipality	• Ability to provide subsidies • Enforcement less complex • Ability to absorb loss in the initial stage • Better chance to tap into donor funds	• Dependency on political situation (e. g., changes of direction with political rearrangements) • Potential low priority level among government activities • Time consuming internal procedures and redtapism • Low flexibility in tuning service provision according to market needs	• Capacity strengthening • Operating autonomously from national authority • Training in management and record keeping

Stakeholders	Advantages	Drawbacks	Needs
Private companies	• Service flexibility • Easy contact with customers • Local job creation • Room for improvement in service quality due to competitive market	• Complexity in coordination with public bodies • Difficulty in accessing subsidies • Less ability to absorb initial losses or shocks • Complexity in coordination • Lack of legal enforcement	• Capacity strengthening • Tax reduction/ Concession for the delivery of public services • Licenses and contracting facilitation • Access to finance at cheaper rate
CBO, associations	• Service flexibility • Local job creation • Involvement of local population • Possibility of raising awareness of the community	• Coordination could be complex • Varying service fees between areas • Managed by different CBOs • Accountability levels could be low • Poor management capacity due to lack of technical and financial acumen • Unskilled human resources and poor continuity of staff	• Coordination committee • Capacity strengthening • Need simple technologies • Increasing accountability

The table above gives a good depiction of the advantages and disadvantages of public and private sector service provision. Any attempts at de-regularising the market should take into account the factors mentioned above.

CHAPTER THREE

STUDY FINDINGS OF **KUSHTIA MUNICIPALITY**

The study findings in Kushtia Municipality (KM) can be broadly divided into demand-side, that is to understand the perception and willingness to pay of customers; and supply-side, that is to understand the state and service delivery mechanism of the service providers. In KM, vacutug-based mechanical service is provided by the municipality itself with its fleet of 3 vacutugs having different suction capacities (1,000, 2,000, and 4,000 litres).

3.1 DEMAND-SIDE ANALYSIS FOR EMPTYING SERVICE

3.1.1 Toilet System and Emptying Behaviour

Current Status of Household (HH) Toilet System

In Kushtia Municipality, most of the respondents interviewed had either a septic tank or pit system with covered slab installed in their houses. There were also a few respondents who had a traditional covered pit. The installation cost of septic tank in Kushtia averaged around BDT 55,000 and for pit it was BDT 11,500. However, respondents had difficulty in accurately recalling the actual price because some of the houses with septic tanks were either renovated or newly built, therefore, the cost was included in the total building cost. Both vacutug service users and non-users said that they would pay the market price to build septic tank if and when required. Currently, they would be willing to pay in the range of BDT 1,200-2,000 for a pit and BDT 45,000-60,000 for a septic tank, depending on the size and capacity of the faecal storage system. Majority of the respondents who were relatively poor opined that they could not even think about spending on a septic tank when they can barely get by on their income.

An important observation from interviews was that almost all septic tank/pit users have an external connection attached to the city drains, channeling the liquid sludge out. This entails that the pit/tank takes more time to fill up and indicates the penchant for households to lessen the frequency and delay the cleaning of the tanks as much as possible.

Emptying Behaviour of Households

Majority of the users and non-users who were interviewed did not empty their tanks in the last year. This was due to the fact that the tanks take a long time to get full. Some of the respondents even predicted that they would not require another cleaning for a minimum of 10 years. As for frequency of emptying, almost all the respondents claimed that they only emptied when the tank was full and overflowed. The frequency of cleaning also depended on the tank's size and the bigger the tank the longer the interval between emptying. The prevalent practice is mostly manual cleaning, however, people with the awareness of vacutug have been seen to prefer mechanical over manual cleaning. Even non-users who did not use the service (as the service was not available at the time of cleaning) stated that they would prefer to use vacutug for their next emptying requirement. Overall, respondents viewed mechanical cleaning in a positive light as opposed to manual cleaning.

Preferred Time of Emptying

Analysis of preference of emptying shows that just above 50% of users preferred emptying at daytime since vacutug service could contain the bad smell and kept the sludge out of sight while cleaning. Surprisingly most of the non-users preferred daytime as well, even though manual service is a very unhygienic process and it spreads bad smell all around. This is because during the day the owners can supervise how the cleaning is being done and monitor whether the emptiers are cleaning the tank properly. It is a messy process and the households have to conduct some cleaning up afterwards; thus day-time is more convenient due to the increased visibility. In KM, it was quite common to see manual emptiers working during daytime, whereas in Khulna this was quite the opposite.

Figure 10: Non-users' preferred time of emptying (20 respondents)

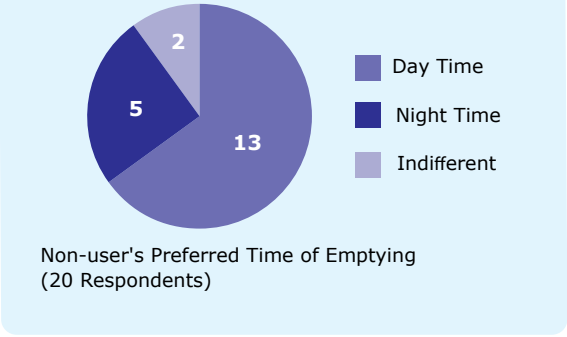
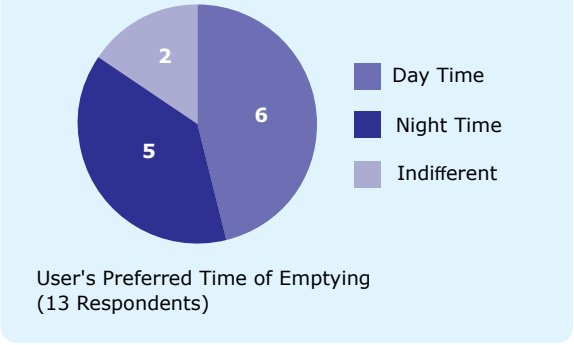


Figure 11: Users' preferred time of emptying (13 respondents)



3.1.2 Access and Availability of Service Availed

Application Process and Perception about the Process

To avail a service, user friendliness is an important deciding factor. Therefore, user and non-user respondents were asked about their opinion of the application process of the respective services they availed.

The process is similar to KCC that is they have to fill up a form and deposit to the concerned official at FSM in KM. However, clients can make the down payment in cash instead of pay order, as required in KCC. From field observation, it was evident that with dedicated 2 clerks and 1 officer serving clients, the application system in Kushtia was reasonably managed.

Most users expressed satisfaction about the process was simple and easy, except a few users who mentioned that applying for the vacutug service was relatively inconvenient. The primary concern was that they had to take time off from work to apply for the cleaning service which is a hassle. Some had to take a day off from work just to apply and had to waste half of a productive working day to just drop an application.

As for the non-users who used manual emptying before, said that it was not as difficult to attain the services of informal emptiers. There is no established application process to reach out to the sweepers. Often these people would gather in front of the municipality office or the local market during the day and people who require their service has to ask around a bit and easily get their service. Some non-users mentioned that they went to the sweepers' living quarters and called them directly through the phone. Thus, reaching out to them was not a problem.

Time-lag between Service Application and Receipt

Around half of the vacutug users got the service within 48 hours after application and the rest had to wait between 48-96 hours to avail the service. Some of the users who faced slight delays did not have much qualms about it; however, some talked about inconvenience as their pit was already

full and on the verge of overflowing. However, all users seemed to recognise the fact that the municipality had limited resources and cannot provide service to everyone at the same time.

On the other hand, non-users who have used manual emptying service said that they got the service the same day they had contacted the emptier. Some even got the service instantly. HHs usually contact the manual emptiers through several methods, such as direct phone call to the emptier, physically going to the emptiers' ghetto, or to their common gathering place. The phone numbers are collected from their neighbours or family members who previously availed the service.

Due to the vacutug's lag time, many users as well as non-users said they would not rely on the service in the time of an emergency. They would call sweepers and get the tanks cleaned instantly. Even if it mean spreading stench and causing inconvenience to the people around. The figures below show the perception of both users and non-users on the time-lag aspect:

Figure 12: Service lag-time: Users (13 respondents)

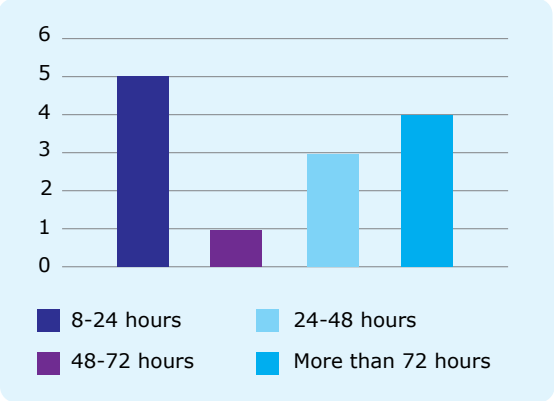
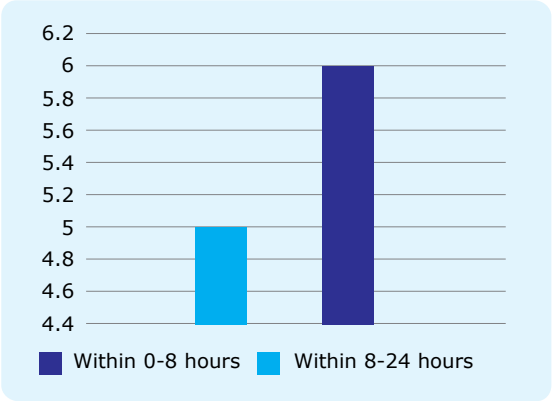


Figure 13: Service lag-time: Non-users (11 respondents)



Reliance on the Service Provision

Users viewed vacutug service mostly in positive light mainly because it was a clean, environment friendly and prevents smell during extraction of sludge. In Kushtia, other than the municipality there are no private service providers for the manual service. However, there were some issues with service delivery such as the vacutug machine does not remove hardened sludge at the bottom, which requires subsequent cleaning by manual emptiers. In addition, the driver and helpers of the service sometimes bargain and ask for extra money. These incidents left some users unsatisfied. Around half of the users also mentioned that in case of emergency they prefer manual emptying rather than apply for a vacutug as they want to minimise risk and avoid defamation by neighbours.

As for the non-users who have used manual service before, they did not have a very high opinion about the process since it was unhygienic and harbinger of smell and disgust in the surrounding area. However, in case of an emergency, most of the non-user respondents would still prefer to call manual emptiers, rather than wait for the vacutug machine to arrive. The figures next page summarise the discussion above:

Figure 14: Preferred method of emptying during emergency: Non-users (11 respondents)

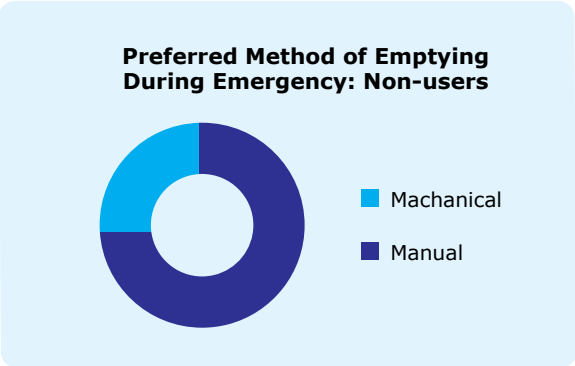
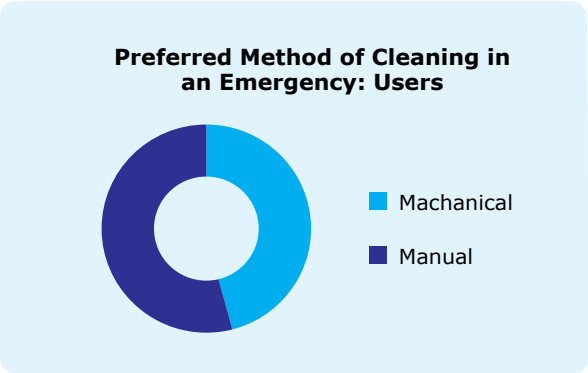


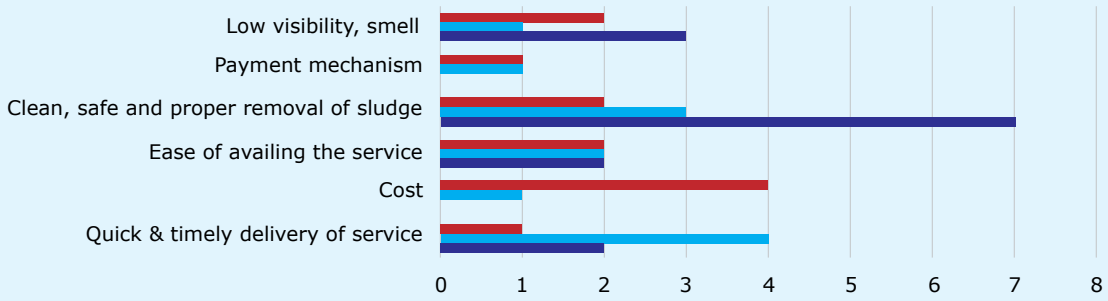
Figure 15: Preferred method of emptying during emergency: Users (13 respondents)



3.1.3 Utility Analysis of Service Provision Based on Ranking Analysis

The overarching objective of this analysis was to gauge customer's perception about the various attributes of both mechanical and manual emptying service. A ranking based matrix was used to uncover customer perception. In terms of mechanical service, most users consider smell free removal of sludge as the most important deciding factor, followed closely by clean and total removal of sludge. This is consistent with the major goal of introducing vacutug based emptying service in the first place. The figure below describes the opinion of users on the various service attributes of mechanical emptying:

Figure 16: Preference analysis of service attributes: Vacutug users (multiple responses of 13 respondents)



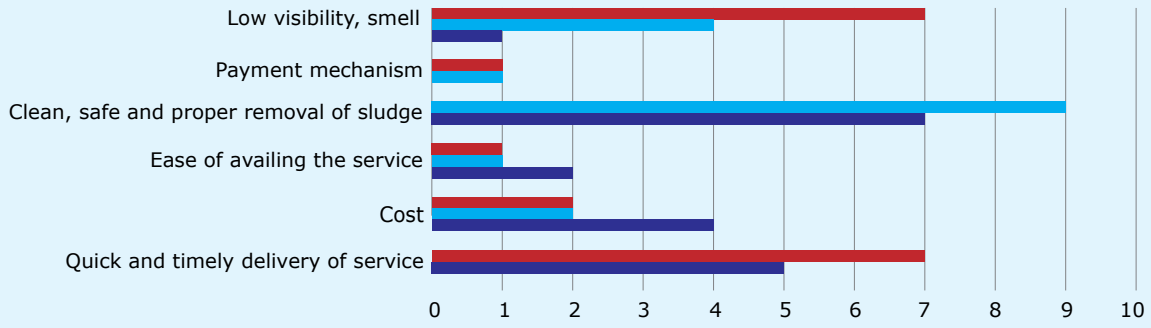
	Quick & timely delivery of service	Cost	Ease of availing the service	Clean, safe and proper removal of sludge	Payment mechanism	Low visibility, smell
3rd Preference	1	4	2	2	1	2
2nd Preference	4	1	2	3	1	1
1st Preference	2		2	7		3

3rd Preferrence 2nd Preferrence 1st Preferrence

From the Figure 14 in the previous page, it can be inferred that, in most cases, clean and safe removal of sludge has received top ranking. This is due to the fact that open spaces, where the sludge could be dumped by digging holes, have declined rapidly. This phenomenon is more prominent in the municipality area. Therefore, unless people have open spaces of their own, it is not possible to dump the sludge safely and quietly anymore and the sludge stays exposed, pollutes the environment and spreads stench and diseases. The second most important attribute that user's ranked in the first rank was lack of smell in sludge removal process. Proper removal and disposal of sludge and timely delivery of service emerged as the third most important attributes that the users regard highly about the vacutug service.

The findings corroborate with the major goal of introducing vacutug based emptying service. From a non-user's perspective proper removal of sludge has been ranked as the topmost and second most priority when it comes to service attributes. The reason is that manual emptiers, however messy they may be, will get the job done completely. vacutug machines cannot pull out the hard sludge at the bottom and manual emptiers have to go in and clean up the mess anyway in most cases. Therefore, in terms of receiving complete solution, manual emptying by sweepers is an attribute ranked highly by their customers. Quick service delivery and cost also appeared important for manual users as significant number of respondents rated them at the top rank. The non-user's findings have been captured in Figure 17.

Figure 17: Preference analysis of service attributes: Non-users in terms of frequency of ranking (multiple responses of 11 respondents)



	Quick and timely delivery of service	Cost	Ease of availing the service	Clean, safe and proper removal of sludge	Payment mechanism	Low visibility, smell
Ranked 3rd	7	2	1		1	7
Ranked 2nd		2	1	9	1	4
Ranked 1st	5	4	2	7		1

Ranked 3rd Ranked 2nd Ranked 1st

3.1.4 Underlying Social Norms Influencing Emptying Behaviour

Social norms play a crucial role in shaping behaviours of an individual. Thus, a behavioural analysis would be incomplete without taking account the social and cultural norms that influences a person's socialisation.

Interview in progress in Kushtia

From field observation, it was seen over half of the vacutug users had employed manual emptying service at least once before shifting to mechanical emptying service. However, very few respondents in that category now view manual emptying process by sweepers favourably. Furthermore, two-third of the users of manual emptying service did not speak highly about the manual emptying service. It is mainly because of smell incited during emptying process and the improper disposal of the waste.

The main drawback of manual cleaning as mentioned by both users and non-users is the bad odor that permeates the air when the pit/tank is opened and the sludge is disturbed. Secondly, manual emptiers are casual about where they dump the sludge. They usually dump it at any place or drain of their convenience. This only makes matter worse as the whole neighbourhood stinks for the next couple of days. Some users also opined that it is injurious to the overall environment too. Another problem that many faced was that the emptiers usually haggle over the price of their service after opening the pit. They would stop work halfway through their task to ask for money to buy liquor. Sometime respondents felt they were being extorted as they started asking for money after the pit was dug open and they could not do anything but to comply with their demands.

Therefore, according to the respondents, mechanical service is collectively preferred. They feel that the process is hygienic and safe disposal, away from their home is ensured. Peer pressure is another factor that encourages people as a community to avail mechanical service. In Kushtia, there is enough community support for the vacutug service championed by the Municipal Mayor.

However, manual emptying service also has many benefits that the non-users acknowledged such as quick and timely delivery and ability to access all areas within the city. Nevertheless, in overall context, they were not highly in favour of emptying sludge in this manner.

When non-users were asked why they did not employ mechanical service last time they emptied their pits, nearly half of them replied that they did not know about the service at the time. Some respondents even mentioned that since they were faced with an emergency, they did not want to

experiment with something new and went for the tried and tested method. Difficulty caused by narrow road to bring the vacutug to the pit or tank prevented some respondents to opt for that service while two respondents marked formal application process as a constraint to avail the service.

However, around four-fifths of non-users mentioned that they would like to try out vacutug service in the near future – the next time they need to empty their tanks/pits. They want to use the vacutug service as they are worried about the prevention of smell during emptying and concerned about their family health and hygiene. The figure below explains the reasons mentioned by non-users for wanting to employ vacutug service in future:

Figure 18: Reasons mentioned by non-users' on why they would choose mechanical emptying next time (multiple responses of 20 respondents)

Stigma Associated with Emptying

All of the user respondents unanimously said that they felt no social pressure or stigma of using vacutugs to empty their pits/tanks in broad daylight. Since there is no visibility of the sludge, they did not consider it as a problem. Some users even said that they felt socially uplifted and felt that their social status was rather enhanced as they were seen using a modern and automated process.

In case of manual emptying it's a "hush hush" business. People do not wish to publicly associate with the sweepers due to the kind of job they do. They also get embarrassed if their neighbours complain during cleaning. As mentioned earlier, historically, the sweepers are treated as "untouchables" in the society. Although the severity of the discrimination against this people declined over the years, the discrimination is still evident. Basically, they live separately in their own ghettos away from the rest of the society and have separate shops for buying HH items.

3.1.5 Pricing Structure and Perception about Pricing

The study found that users of KM operated vacutug service had to fill up an application form and pay the down payment in cash. Upon receiving the service, the total expenditure is generated considering the number of trips. Different sizes of the pit or safety tank required different number of trips and total cost depended on the number of trips. However, for respondents who employed manual emptiers, the cost structure is not defined. Depending upon the size of the pit/tank the informal emptiers make their demand. Generally, for an average sized pit manual emptiers demand something in the range of BDT 500-800 and for septic tank the average emptying charge as mentioned by the respondents remain in the range of BDT 1,500-2,000. However, for disposal service along with emptying they usually charge around BDT 3,000 to 4,000.

The table below summarises the detailed cost structure for availing various service options in KM. The cost structure has been prepared after collating data from the service providers.

Table 17: Tariff structure of emptying service in KM

Particulars	KM Operated Vacutug	Manual Emptiers
Application Process	Filling application form and submitting to conservancy department	Calling directly or through middlemen
Fixed Cost	1,000 Liter vacutug- 1st trip 800+15% VAT 2,000 Liter vacutug- 1st trip 1,000+15% VAT 4,000 Liter vacutug- 1st trip 1,200+15% VAT In case of ring slab pit vacutug charge is - Tk. 500+ 15% VAT	Nothing fixed but based on pit size and negotiation. Average range: • Pit: BDT 500-800 • Septic Tank: BDT 1,500-2,000 for emptying only and BDT 3,000-4,000 for emptying and disposal.
Variable Cost	1,000 Liter - next each trip 200 +15% VAT 2,000 Liter - next each trip 300 +15% VAT 3,000 Liter - next each trip 500 +15% VAT	Kerosene and other entertainment cost (BDT 200-300)
Payment Method	Cash	Cash

Perception of Respondents on Tariff

Most of the users of vacutug service were either satisfied or indifferent with the tariff structure. However, about a quarter of users suggested that the tariff structure is unjustified.

In case of manual emptying, majority of the users of manual emptying service are happy with the tariff charged. Even though the bad odor can became a nuisance for the neighbours and surrounding environment, the fact that the pit/tank was cleaned thoroughly left clients very happy as they got the value for their money.

Paying Behaviour in Case of Emergency

During emergencies, getting the tank cleaned was the primary objective. The users who were willing to pay extra in case of emergency said that they are willing to pay 24% more on average in such a situation. However, majority of the users with relatively lower income said that they are unwilling to pay more. One of the reasons behind such unwillingness is that they were not satisfied with the previous service and that they have to pay extra tips regardless of emergencies.

Non-users, both non-poor and relatively poor unanimously said that they will pay extra. This is due to the fact that manual emptying is relatively cheaper than mechanical service and thus they were willing to pay around 30% more.

Perception on Payment Method and Modality

Almost all the respondents mentioned that they preferred cash as payment modality since it is easier and convenient for them. They opined that for a small amount in the range of BDT 1,000-1,500, it would not be a good use of time if they had to visit a bank and issue a pay order. Furthermore, respondents also opined that they do not prefer payment in installments as it's a small amount.

Perception about Paying Annual Taxes for FSM

Respondents were asked whether they would be interested to pay annual taxes for FSM along with other periodic charges they pay to the Municipality such as holding tax. In response, the users were equally divided on whether they are willing to pay regular taxes or subscription fees to avail FSM service from KM. After averaging the user's stated amount that they would be willing to pay as tax annually, the figure came out to be BDT 450. The users who did not want to pay stated various reasons for their views. Some said it should be part of the conservancy fee they already pay, while others were skeptical about getting timely service even if they paid subscription fee. The non-users just like the users were divided amongst themselves on this matter and average total willingness to pay annual tax for FSM tax/charge for non-users amounted to BDT 209.

In Kushtia Municipality relatively poor respondents, who agreed for paying annual taxes were interested to pay BDT 220 on average. On the other hand, non-poor interviewees were willing to pay BDT 435 on average annually for the FSM service.

3.1.6 Willingness to Pay for FSM

A key focus of this study is to find out the willingness to pay (WTP) for emptying service, especially for safe emptying service using vacutug. As mentioned before, Choice-based Conjoint analysis technique was used to extract customers' willingness to pay for the service. Different elements of the service such as, time-lag, preferred time of cleaning etc., were presented to the respondents and their preferences were noted. Then they were asked about their willingness to pay for their preferred combination. They were also asked, how much they would pay for the actual service provision model that exists in their respective city. Both users and non-users of vacutug service were subjected to the same questions.

The table below captures the results garnered from the above mentioned investigation method:

Table 18: Preferred service provision elements of both users' and non-users' (in % of respondents for each group)

	User	Non-user
Preferred service time-lag		
12 hours	38%	60%
24 hours	62%	25%
48 hours		5%
72 hours		10%
Preferred time of receiving the service		
Day	46%	60%
Night	38%	25%
Indifferent	15%	15%
Preferred communication method		
Physical application	8%	5%
Apply through mobile/Phone	92%	90%
Service booth/Sub-centres		5%
Preferred mode of payment		
One shot	100%	85%
Installment	0%	15%
Others	0%	0%
Preferred payment method		
Cash	100%	100%
Bank draft		

From the table on previous page, it is safe to assume that most of the respondents (both user and non-user) are unwilling to wait for service delivery for more than 24 hours. Unlike other comparable cities, people of Kushtia have higher levels of acceptance towards FSM be it mechanical or manual. They understand the necessity of cleaning and more than willing to conduct cleaning during day time. Their preference is reflected in the investigation as majority of the users, as well as non-users said they preferred day time cleaning as opposed to night time. About 38% percent users still prefer night time cleaning but vacutug is not available at night, so they clean at daytime. In terms of the application process to avail the service, majority of user and non-user respondents mentioned that they prefer communicating via mobile phones with the service provider. Most of them would like to avoid the hassle of going to an office or to the living quarter of the service provider (manual emptiers' colony) to avail the service. Majority of the respondents, both user and non-users, said that after receiving the service they would like to clear their dues with a one-time cash payment. They believe going to the bank for a bank draft is a hassle and they do not want to be burdened with the payment of FSM services for a long period of time.

Subsequently, both users and non-users were briefed about the service provision model for vacutug based emptying service that exists in their city and told to express their eagerness to avail the service and in what price range. The table below depicts the WTP of respondents, based on their preferred service model, i.e. if they were paying for their preferred service model and for the actual service provision model that exists in their city.

Table 19: Willingness to pay of respondents by category

Respondent Type	Average WTP for preferred service provision	Average WTP for actual service provision
User	BDT 1,330	BDT 1,240
Non-user	BDT 1,116	BDT 938
Total Average (user+non-user)	BDT 1,203	BDT 1,070
Relatively Poor	BDT 1,064	BDT 885
Non-poor	BDT 1,360	BDT 1,310
Pit User	BDT 820	BDT 630
Septic Tank User	BDT 1,850	BDT 1,500

Note:

i. Preferred service refers to the combination of the total service provision that the respondents preferred
ii. Actual service refers to the service provision model available in their respective CC/ Municipality
iii. The monetary figures denote total willingness to pay for service provision, not per trip or capacity of emptying.

Interview in progress in Kushtia

From the table earlier, certain inferences can be drawn. For the users, it can be seen that average willingness to pay for preferred service provision is BDT 1,330 and for actual service provision model in KM, it is BDT 1,240. Thus, the difference is not very significant and it entails that perception about tariff for vacutug users is not that negative.

In the case of non-users, the scenario is similar to that of users, i.e. respondents preferring to pay a bit more compared to the actual service provision. Comparatively, users of vacutug had willingness to pay a higher amount compared to non-users.

The relatively poor HHs cited comparatively lower amounts compared to the total average of 1,203. This is not surprising given the fact that poor HHs are justifiably thrifty. Moreover, lack of awareness about the pricing structure of vacutug service may have led to this finding.

In case of pit and septic tank user, it is not surprising to see that pit user's WTP is much lower compared to septic tank user. HHs who have pits installed didn't have to spend more than BDT 1,000 before to empty their pits, so their WTP being below BDT 1,000 is logical.

3.2 ANALYSIS OF SERVICE PROVISION FOR EMPTYING SERVICE

In Kushtia Municipality (KM), there are broadly 2 types of service providers for faecal sludge management. KM itself is a major service provider with their fleet of 3 vacutugs. There are also the bevies of manual emptiers belonging to the Harijan community and providing emptying service through generations. To obtain information about the service provision models, KIIs were conducted with both senior and operational level officials of both KCC, CDS and with traditional manual emptiers.

3.2.1 Vacutug-based Mechanical Emptying Service

Service Provision Model

Vacutug of Kushtia Municipality

The Kushtia Municipality has a total of 3 Vacutug trucks of 1,000, 2,000 and 4,000 litre capacity received from various development projects since 2004. They also have 1 permanent driver, 1 non-permanent (master role) driver and 7-8 other sweepers working in part time basis (master role). The emptiers are also occasionally employed to do other types of cleaning such as other garbage cleaning.

As mentioned before, customers seeking services submit an application to municipality along with the cash. Conservancy department under KM would then direct the relevant team to carry out the emptying procedure.

Sometimes the operators/emptiers going with the truck also provide extra service personally such as cleaning the hard sludge manually but charge an extra fee for that.

The conservancy officials claimed that the time-lag between call and service delivery is usually 48-72 hours and in 1 instance it was even 11 days. If it requires more than one trip, customer pays for the additional trip in cash. On average they receive 20-25 calls per week during rainy season and around 10-15 calls per week in other times of the year. The operation can accommodate highest of 3-4 calls per day. The detailed tariff structure is already discussed in section 1.5 of Kushtia findings.

After discussion with concerned officials of KM, the cost of service delivery was ascertained, as illustrated in the following table:

Table 20: Cost structure of service provision for vacutug service - KM

Particulars	Cost (BDT)/Per day /Per trip
Fuel (7 litre diesel for each round trip)	400-500 depending on truck size
Driver's remuneration	220
Operator's Salary (BDT 185*2)	370
Total	**1,000-1,100**

From the table above, it is seen that per trip cost for providing vacutug service ranges from BDT 1,000-1,100 taka, depending on the capacity of the truck used for the task. In section 1.5, it was described that the KM is charging BDT 800-1,200 taka per trip depending on truck size. Thus, breakeven is more or less achieved per trip but since they are making multiple trips per day, fixed cost of driver and operator's salary is constant for the day; therefore, the KM is actually making a profit. In fact, discussion with KM officials revealed that they don't take emptying requests unless payment is made upfront for at least 2 trips.

Collating data collected from KM officials, it was ascertained that they are currently doing around 800-1,000 trips per year and earning revenue of BDT 1 million (approximately).

Problems in Service Delivery

KIIs with relevant officials and operational force of KM revealed some problems or bottlenecks affecting the service quality of the vacutug service. One major problem cited by them was that on many places the trucks cannot be maneuvered as the roads are not wide enough. Even the smallest truck needs 6.5 feet of clearance. In some instances, the vacutug pipes are not long enough to reach the pit or septic tank because the distance from the truck to the pit exceeds the length of the suction pipe. Furthermore, there is lack of experienced and trained drivers to operate all their vehicle fleet. Thus, the facility sometimes operates under capacity resulting in greater time lag for service delivery.

Another major problem cited by the service providers was that vacutug can only suck out the liquid and semi-liquid sludge. In case of hardened sludge at the bottom, it is impossible to clear it with the vacutug. Operators of vacutug machines also mentioned that the gloves provided to them are of poor quality and they often get injured while opening a pit or a septic tank.

Profiling of Customers Availing Vacutug Service

Pit users or low and medium low income group customers more frequently take mechanical emptying service compared to large septic tank users who are relatively more affluent. Poor people whose HH newly joined the municipality are reluctant to take vacutug service. Their main concern is cost rather than health and hygiene. According to service providers, the vacutug service is a clean and hygienic process and costs only a bit more than manual emptying and that is precisely why the vacutug is gaining popularity.

There are other reasons behind non-users avoiding the vacutug service. The relatively affluent people who constructed their houses recently installed new and larger tanks and did not feel the need to empty their tanks. Other non-users avoided the service due to their aversion to change and mistrust towards the quality of service of the municipality. Meanwhile, the relatively poor residents may have been concerned about the prices.

Perception of Service Providers about Tariff Structure

Officials and operators involved in the vacutug service operation mentioned that the existing tariff structure is justified. The current business model meets the breakeven point by a margin and any reduction in the tariff would lead KM to incurring loss.

From KIIs, it was also determined that there will be no subsidy embedded in the tariff structure. However, initially, they provided the service for free and charged only fuel cost for a few months to make the service popular.

Initiatives for Service Promotion

There are no formal initiatives to promote the service by the KM. The service provider believes that they are providing the service at a very low cost compared to Khulna and Jhenaidah and this itself is a big promotion of the service. As mentioned before, the service was highly subsidised which encouraged a lot of people to avail the service in the early days. The Mayor himself is a big advocate of vacutug service and is quite vocal about the necessity of safe emptying of faecal sludge to keep the city clean.

Future Plans for Improvement in Service Quality, Delivery and Recommendations from Service Providers

After discussion with senior management of Kushtia Municipality, it was ascertained that they have no immediate plans to deregularise the market, i.e. allow private sector to provide FSM service using their own business models. However, there is need to improve capacity and service delivery aspects of the present mechanical emptying service provision in KM. Discussion with senior officials of the KM revealed that there is urgent need to increase the fleet size of the vacutug service, since with their present fleet they cannot bring down the time-lag between service request and delivery to 24 hours. At least 2 more vacutug machines (1,000 and 2,000 litre) are required to cater to present demands effectively. Trained drivers are also needed to operate existing and proposed vacutug machines. Operational staff related to vacutug service should also be brought under regular training (twice a year) so that they are skilled and effective while they are rendering the service to the HHs. NGOs like SNV may develop training manuals for the operational staff related with vacutug service provision.

According to senior staff of KM, they also have plans to build improved treatment plant to ensure proper and complete FSM. NGO activities may also focus on mobilising communities to raise awareness about the importance of keeping their city and environment clean, thus encouraging more people to adopt mechanical emptying service. The dumping grounds for faecal sludge is inadequate at the moment and expanding the area of the dumping ground is also in the plans of the KM. However, the activities of the FSM unit would be much better managed if a separate unit for FSM can be included in the organogram of KM.

3.2.2 Informal Emptying Service by Manual Emptiers

Kushtia Municipality has around 70-80 active manual emptiers engaged in all types of cleaning work starting from faecal sludge to cleaning drains to working in hospitals as emptiers. The manual emptiers have an unenviable life, being looked down upon by the wider society for the nature of their profession. They have separate living quarters within the city and the informal emptiers and their next generation face constant challenge to integrate themselves with the wider society.

Service Provision Model

There are many ways in which the manual emptiers can be contacted. They are sometimes contacted over phone by prospective customers. Alternatively, they hang out at a gathering place in the morning and customers seeking their service come to the designated place and contact them directly.

Once contracted, they are ready to provide the service on the same night, if the customer desires so. Often they work in a team of 2-3 members and their payment is fixed through bargaining with customers, but average remuneration is usually between BDT 1,500-2,000 for septic tank and BDT 500-800 for pit (depending on size). Additionally, they demand some extra cash as tips from the customers after completing their task and happy with whatever extra they are paid.

Manual emptiers claim that they provide the complete solution in the sense that they clean the pit completely leaving no hard sludge behind, whereas vacutug machines don't always manage to clear the hard sludge. To dump the sludge they dig deep holes on the ground and bury the collected sludge. Besides, they are available instantly and their services are cheaper than the vacutug. Their payment is also easier as they only take cash that the customer does not have to go through the hassle of a bank.

Manual emptiers prefer to work at night, starting from around 9 p.m. at night finishing before dawn. They think this is the best time to work since in the day time they often faced objections from neighbours due to the spread of smell.

Perception about Mechanical Service and Scope of Integration

The emptiers don't feel immediately threatened by the arrival of the vacutug service; however, in the long run, if more and more people get accustomed to using the service then they might feel threatened. Subsequently, if modern vacutug machines are invented which can also remove hard sludge then demand for manual emptying may reduce and their livelihood will be at risk.

It is not surprising when the manual emptiers showed palpable enthusiasm when asked whether they would want to integrate their service with the vacutug based service. They acknowledged that their sludge cleaning behaviour is very unhygienic and harmful for their health. They would much prefer to be integrated with such services that ensure their health and wellbeing and also provide them with a steady source of income. However, they mentioned that it is difficult to get into the KM operated vacutug operation since the recruitment process is not transparent. They would much prefer to work with a private organisation or NGO, if they get permission to operate vacutug service. Any attempts at integration should also account for their training needs, since they are not used to operating machines of any kind.

According to the manual emptiers, shifting to mechanical emptying service will increase their social status since it will allow them to claim that they don't touch sludge directly. They also mentioned that if they can get the opportunity to regularly work as vacutug operators, then their financial condition may also improve depending on their remuneration package. But, they don't know much about the remuneration at the moment. Regardless of the monetary compensation, the possibility of improving their status in the society is more important to them.

3.3 RECOMMENDATIONS FOR EFFICIENT FSM VALUE CHAIN

3.3.1 Service Quality Improvement

- Increase the fleet of vehicles to improve service delivery and reduce lag time. At least 2 smaller vehicles (1,000 and 2,000 litre) should be added in near future.
- Establish system of online payment and payment through mobile banking to make the payment process easier.
- Include FSM tax with regular tax that HHs pay. HHs showed willingness to pay annual taxes for FSM, which is encouraging. With the revenue from tax, KCC may improve aspects of their service delivery and use the money for regular maintenance of their vacutug fleet.
- Arrange for regular training of operational staff involved with FSM. Training manuals need to be developed which will act as a guide for all future training for the staff.
- Launch awareness campaigns to increase awareness among people. Mosques and Schools could be good platforms where awareness campaigns may be focused due to possibility of reaching large number of people. Facilitation of CBOs or NGOs could be considered for this endeavour.
- Community based approach to raise awareness of proper FSM may be initiated with the facilitation of development partners. In each ward, FSM groups may be formed consisting of 50-70 HHs. These groups can meet regularly, arrange workshops and conduct sensitisation of the local HHs.
- Invest in increasing the size of the dumping grounds for FSM, to ensure proper disposal of harmful substance.
- Establish dedicated wing for FSM in the organogram of KM for effective service delivery.

3.3.2 Tariff Structure

Average willingness to pay by customers in KM is around BDT 1,203 (for both users and non-users), whereas non-poor HH had an average willingness to pay BDT 1,360. Relatively poor HHs, on the other hand, had willingness to pay BDT 1,064. Thus, the tariff structure in Kushtia (as seen in section 3.1.5) seems in alignment with the residents' expectation and willingness to pay. In fact WTP for FSM is almost similar to what they are actually paying for it. Therefore, the present tariff structure may be continued for both septic tank and pit but aspects of service delivery can be improved such as reducing the time-lag. Any price hike should be done gradually. Currently, there is no urgent need to propose another rate for the poor but a lump sum discount (20-30%) on the total amount can be given for a period of 6-9 months, on trial basis. However, deciding on who is poor and non-poor could be challenging and many non-poor people may actually claim to be poor, just to enjoy the subsidy. Thus, any such imitative needs to be carefully handled and monitored.

3.3.3 Scope for Privatisation

The KM is running the vacutug operation reasonably well at low cost, though the current manpower and vehicles are marginally overburdened. However, allowing private sector operators at this juncture may not be prudent without conducting a proper feasibility. KM can improve their service delivery by adding more vehicles to their fleet of cars. However, if there is a trend of increasing demand, the KM might face some difficulties to cater to the needs of the residents effectively and privatesector entities may be given license to operate as the market demand grows.

3.3.4 Roles and Responsibilities of Stakeholders

One of the main reasons for the failure of FSM systems is the overlapping and unclear allocation of responsibilities and lack of incentives for efficient operation. This situation frequently occurs where an incomplete institutional framework exists. It leads to lack of accountability and disagreements between stakeholders. Since the entire service chain is interlinked, each aspect influences another and it is essential that the roles and responsibilities are clearly defined. Thus, coordinating the link between each step in the chain is essential to ensure a successful FSM system. The distribution of the responsibilities among the stakeholders should be decided taking into account the intrinsic strengths and weaknesses of each stakeholder involved in the service chain. Incremental improvements can be facilitated either through capacity building or reorganisation of different stakeholders. For Kushtia, the CDC model as in Khulna may not be required since the KM is doing a decent job of catering to customer needs. Roping in new players might only complicate the service delivery mechanism. The table below depicts the proposed roles and responsibilities of each of the stakeholders, in order to make the FSM value chain more effective:

Table 21: Willingness to pay study

Stakeholders	Laws	Coordination	Collection & Transport	Treatment	Resource Recovery	Enforcement	Training & Information	Monitoring
Ministries	✓	✓				✓	✓	✓
City Corp. or Municipality		✓	✓	✓	✓	✓	✓	✓
Law Enforcers						✓		
Pvt. Companies (if and when given license)			✓	✓	✓			
NGOs		✓					✓	✓

The table below describes the possible advantages and disadvantages of the stakeholders:

Table 22: Willingness to pay study

Stakeholder	Advantage	Drawback	Needs
Municipality	• Ability to provide subsidies • Enforcement less complex • Ability to absorb loss in the initial stage • Better chance to tap into donor funds	• Dependency on political situation (e.g. changes of direction with political rearrangements) • Potential low priority level among government activities • Time consuming internal procedures and red tapism • Low flexibility in tuning service provision according to market needs	• Capacity strengthening • Operating autonomously from national authority • Management and record keeping training
Private companies	• Service flexibility • Easy contact with customers • Local job creation • Scope for improvement in service quality due to competitive market	• Complexity in coordination with public bodies • Difficulty to accessing subsidies • Less ability to absorb initial losses or shocks • Complexity of coordination • Lack of legal enforcement	• Capacity strengthening • Tax reduction/ Concession for the delivery of public services • Licenses and contracting facilitation • Access to finance at cheap rate

The table above is good snapshot of the advantages and disadvantages of public and private sector service provision. Therefore, any attempts at de-regularising the market should take into account the factors mentioned above.

CHAPTER FOUR

STUDY FINDINGS OF **JHENAIDAH MUNICIPALITY**

The study findings in Jhenaidah Municipality (JM) can be broadly divided into demand side (the perception and willingness to pay of customers of JM) and the supply side (the state and service delivery mechanism of the service providers). In Jhenaidah Municipality, vacutug based mechanical service is provided by the JM itself with its fleet of 2 vacutugs, having different suction capacities (1000 and 2000 litre).

4.1 DEMAND-SIDE ANALYSIS FOR EMPTYING SERVICE

4.1.1 Toilet System and Emptying Behaviour

Current Status of Household (HH) Toilet System

Jhenaidah is a growing municipality, where a high percentage of urban households are using septic tank system toilet. Nonetheless, a different picture was found in the outskirt, where a large number of households were using pit system latrine. Almost all the households were using the individual latrine in Jhenaidah Municipality area and some of the households shared their septic tanks with other households.

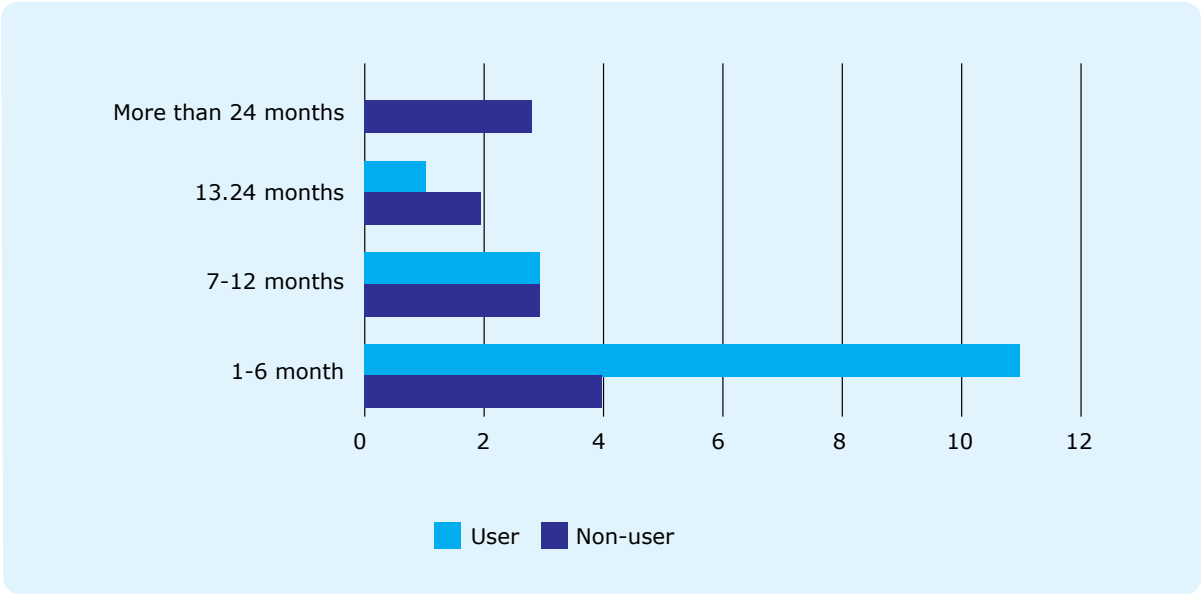
Most of the households have their septic tank/pit built at least a decade ago. On average, a household spent BDT 30,000-35,000 to build a septic tank and BDT 4,000-5,000 to build the pit system toilet. Our study also found that, some of our respondents have already planned to rebuild a new septic tank soon when they renovate their house. HHs are willing to spend BDT 43,750 on average, to rebuild septic tank if and when required.

Emptying behaviour does not depend on using septic tank or pit. It depends on household's awareness, economic conditions, and overall knowledge.

Emptying Behaviour of HHs

In Jhenaidah Municipality, majority of the households employ emptying service only when there is an overflow. Lack of awareness and emptying cost are the main influencing factors of present practice. From field investigation, it was seen that most of the vacutug users employed emptying service in the

Figure 19: Analysis of emptying behaviour: Users (15 respondents) and non-users (12 respondents)

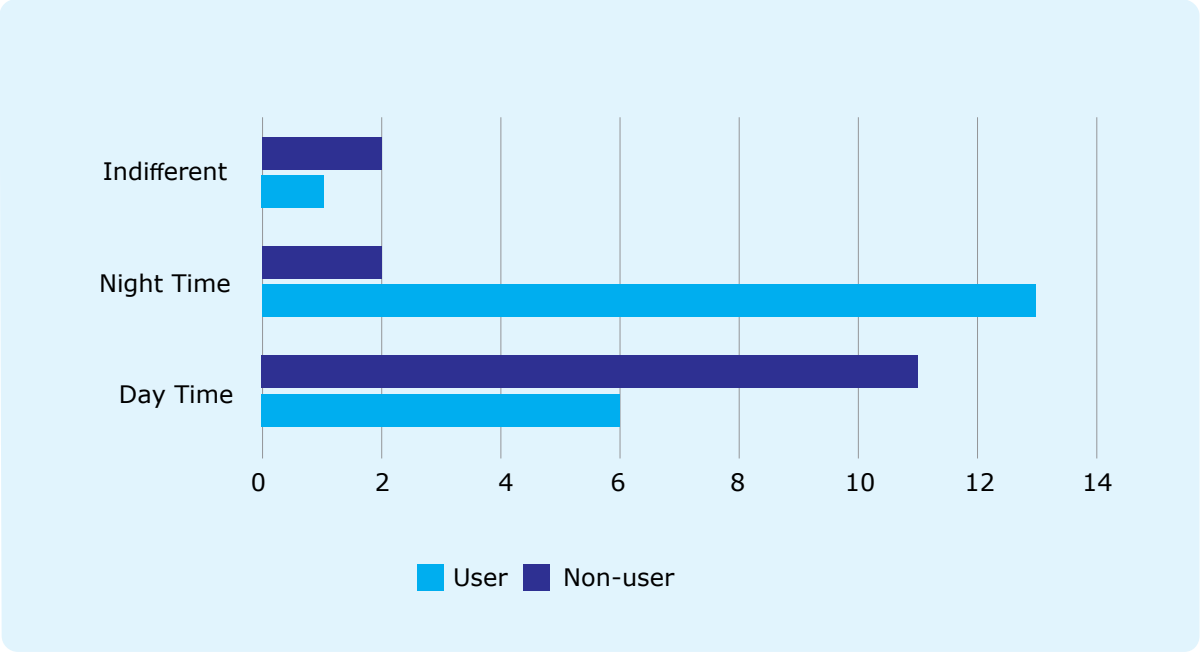


last 6 months and most of the users and non-users employed emptying service (mechanical or manual) within the last 2 years. Respondents mentioned that formation and accumulation of hard sludge at the bottom of the pit/tank led them to seek emptying service at least once in 2 years. This is a welcome behavioural change among Jhenaidah residents. Whether they are emptying in safe or unsafe way, at least they are emptying frequently.

Preferred Time of Emptying

In case of users of manual emptying, almost all respondents preferred night time for emptying. This is because odor is released into the air during pit emptying which could be unnerving for even a calm person. There is also chance of spreading disease and causing breathing difficulties. Non-users also mentioned that night time is the right time to complete the "dirty" work, when everyone is in deep sleep. On the other hand, most vacutug users expressed no qualms about emptying during day time because vacutug emptying is a safe and hygienic service with no bad odor spreading in the surrounding areas as such and no physical contact needed with the sludge as well.

Figure 20: Preferred emptying time: Users (15 respondents) and non-users (20 respondents)



4.1.2 Access and Availability of Service Availed

Application Process and Perception about the Process

In Jhenaidah, only JM has the authority and equipment to provide vacutug based mechanical emptying service. There are also informal emptiers plying their trade and providing FSM solutions to the residents of the town.

In case of vacutug service, interested users need to apply in municipality office for availing the service. After filling up a form, they can submit their application with the required amount of down payment in cash. According to most users that were interviewed, the application process is quite simple and convenient.

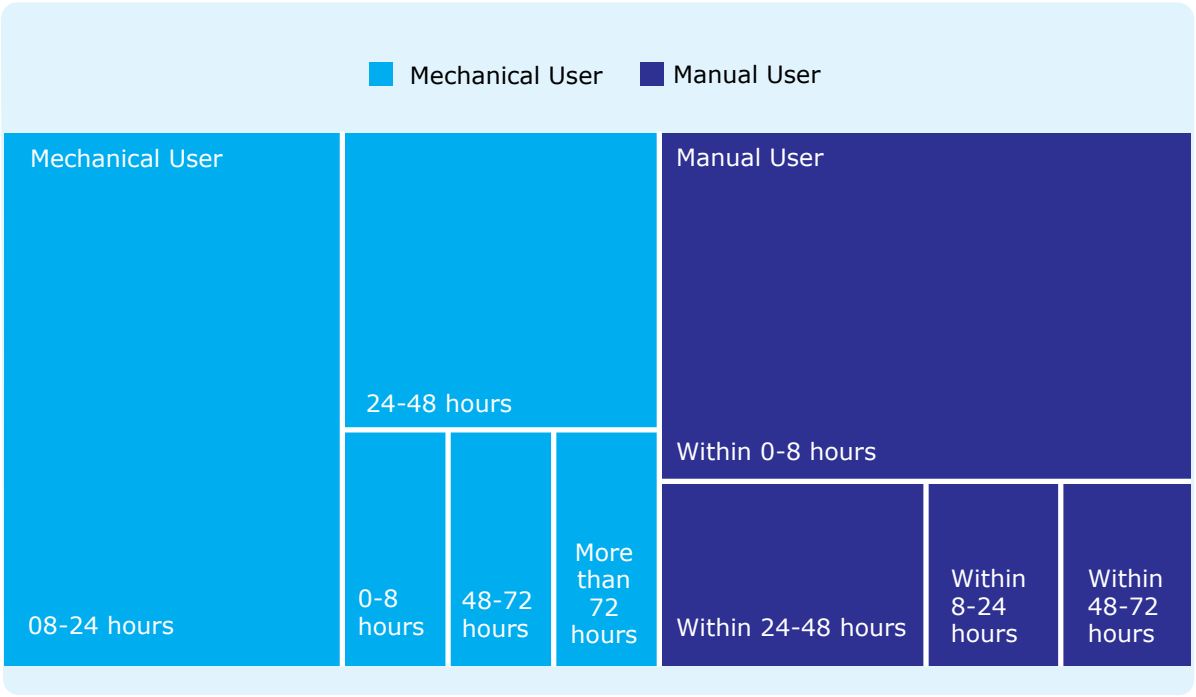
As for respondents employing manual emptying service, they usually establish contact with sweepers/emptiers through a variety of ways. Manual emptiers could be contacted over mobile phone or in person by going to the sweeper's ghetto or their gathering place near the town centre.

Time-lag between Service Application and Receipt

All the respondents opined that lag-time between application and receipt of the service is an important factor for them. It is particularly important as the decision to empty the pit is mostly taken reactively rather than proactively. Often emptying decision is taken on the occasion of detection of smell or overflow from their respective pits/tanks. In Jhenaidah, most of the respondents (both user and non-user) have received this service within 24 hours that they have appreciated. However, few users of vacutug mentioned that it took 3-4 days for them to receive the service that caused some inconvenience for them.

On the other hand, manual emptiers can provide this service almost on the same day of being contracted. Some of the manual emptiers even go door to door and vouch for emptying the HH tank. From field investigation, it was seen that most of the users of manual emptying service get the service within 8 hours. The area chart below summarises the discussion below:

Figure 21: Area graph depicting preference time of users (15 respondents) and non-users (12 respondents)



Reliance on the Service Provision in Emergency Situation

In Jhenaidah, manual emptying of pit/septic tanks is common and part of a long tradition. On the contrary to manual system, mechanical emptying of sludge is being practiced only for the last few years in Jhenaidah and city residents have been picking up the practice slowly.

From interview with users and non-users, it was evident that almost two-thirds of vacutug users are confident about relying on the vacutug service delivery mechanism to cater to their needs in an emergency situation. This substantiates the fact that service lag time in Jhenaidah for vacutug service is still in an acceptable range. With regards to manual emptying service users, almost all the respondents mentioned that they would prefer to call manual emptiers for FSM in emergency situation.

Vacutug users also mentioned that they prefer mechanical emptying, since the unwanted sludge can be transported outside the neighbourhood. There is already a dearth of dumping grounds near their locality these days. However, in some cases vacutug can't remove sludge properly because of solidified hard sludge accumulation in the bottom of pits/tanks. This phenomenon occurs when sludge is left in the tank/pit for a long time. Thus, in instances like this, they have no option but to call upon the manual emptiers, even if they had taken the service of vacutug.

4.1.3 Utility Analysis of Service Provision Based on Ranking Analysis

The overarching objective of this analysis was to gauge customer's perception about the various attributes of both mechanical and manual emptying service. A ranking based matrix was used to dig out customer perception. Users of vacutug were asked about their experience of using vacutug machine and told to rank aspects of the service provision according to their perceived value of that attribute. The same exercise was replicated with the non-users.

Most respondents who have employed vacutug service consider clean, safe and proper removal of sludge as the most important attribute. They believe that the fact that sludge is safely removed and dumped into a safe place away from their habitat area is important. Low visibility of dirty sludge and lack of smell during emptying process was also ranked very highly by the users. The figure next page sheds some light on the rankings distribution of each of the service attributes:

From a non-user's perspective, for users of manual emptying service proper removal of sludge has been ranked as the topmost priority when it comes to service attributes. Subsequently, they ranked quick and prompt service delivery as priority concern. The reasoning behind this phenomenon is that manual emptiers are prompt and can respond more efficiently during an emergency situation. The diagrams next page further illustrate the discussion above:

Figure 22: Ranking analysis of service attributes: Users (multiple responses of 15 respondents)

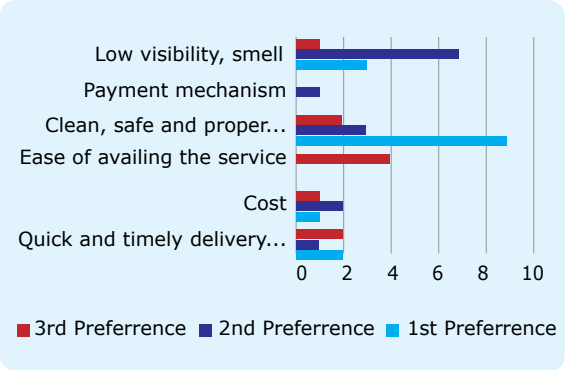
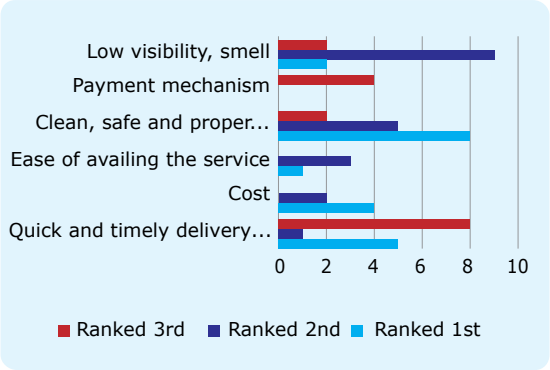


Figure 23: Ranking analysis of service attributes: Non-users (multiple responses 12 respondents)



4.1.4 Underlying Social Norms Influencing Emptying Behaviour

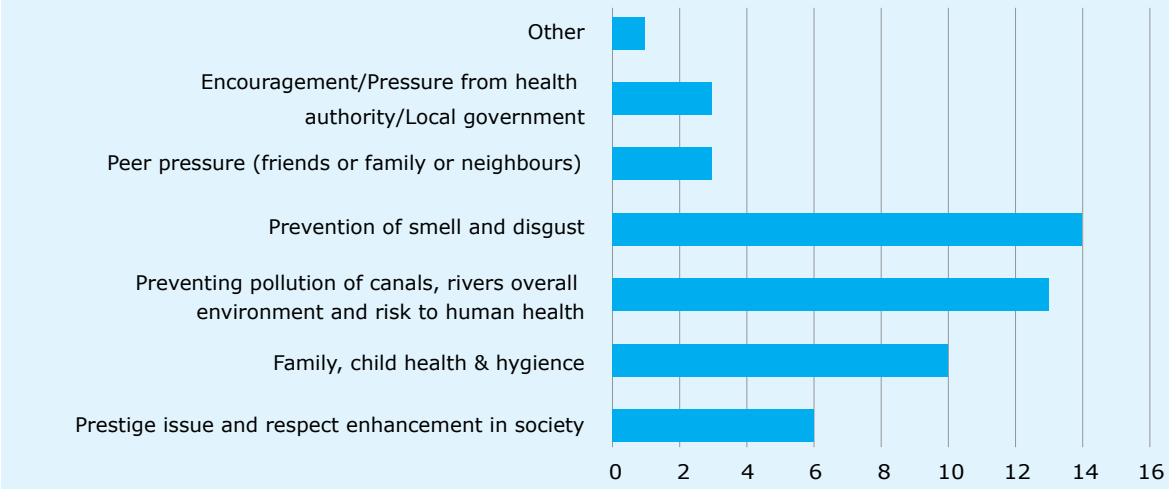
Social norms play a crucial role in shaping behavioural setup of an individual. Thus, a behavioural analysis is crucial for this study to take into consideration the social and cultural norms that influence a person's emptying behaviour.

Interview in progress in Jhenaidah

From field investigation, it was seen that half of the users of vacutug service users had employed manual emptying service at least once before shifting to mechanical emptying service. However, after using the mechanical system most of them viewed manual emptying process unfavourably and have no plans to employ manual emptying service in the future. Even, three quarters of manual emptying service users did not speak highly about manual emptying service mainly due to the spread of smell during emptying and concerns about the improper disposal of the waste near their habitats.

However, manual emptying service still has its merits as per the non-users who noted that manual emptiers can access pits/tanks in deep slums or localities where vacutug trucks or pipes cannot reach. Manual emptiers are also indispensable to clean out rock-solid waste at the bottom of the pit/tank. Users of vacutug based mechanical emptying service were also probed on why they chose mechanical emptying over manual emptying. Their responses are organised in the chart next page:

Figure 24: User's reasons behind opting for mechanical service over manual (multiple responses of 15 respondents)

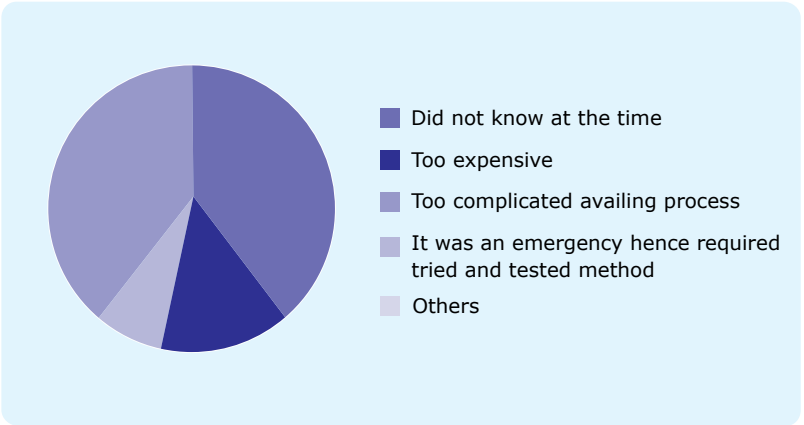


From the figure 22 above, it can be inferred that prevention of smell and care for environment and family health encouraged most users of vacutug machine to prefer it and abandon traditional form of emptying through non-users. This is heartening to note that Jhenaidah user's understand the value of preserving the environment and are concerned about polluting the wider environment.

Subsequently, respondents who did not employ mechanical emptying service, non-users were asked about why they did not employ mechanical emptying mechanism during their last emptying. The following figure captures their views:

Figure 25: Reasons for non-users' for not employing mechanical emptying during last emptying process (12 respondents)

From figure 23, it can be seen that most non users mentioned about their lack of awareness about the vacutug operation during their last emptying and also stated an "other" factor which basically refers to the incompleteness of the service delivery that is the inability of vacutug machine to clear hard sludge.



When the non-users were asked, if there were any reasons that might discourage them from employing vacutug in the future, some of the respondents opined that they have very little idea about the vacutug service, hence they would not invest considerable amount of money in it unless they are sure about its effectiveness. However, more than half of the respondents were in favour of employing the vacutug service in their next emptying endeavour. The reasons cited for this is remarkably similar to what user mentioned about the benefits of vacutug service and what gave it the edge in their minds so that they abandoned manual emptying process. Some non-users also mentioned about uplifting of their social status as a possible reason that they might be enticed to call a vacutug the next time they require emptying their pits.

Stigma Associated with Emptying for Customers

Emptying of pit is seen as a necessity by all respondents regardless of income groups. When the pit or tank is full or overflowing and creating smell, then emphasis is on quick efficient cleaning of the situation.

However, for manual emptying users, two third of the respondents prefer night time for the action just to avoid disturbing the neighbours and subsequent negative comments from them if any. For mechanical cleaning, users have no qualms about being seen employing vacutug service in daytime since the operation is smell free and zero-visibility of sludge is ensured.

4.1.5 Pricing Structure and Perception about Pricing

From field observation, it was seen that most respondents did not show a good understanding of the cost breakdown as most paid the total amount at once and can't recall what amount was attributed to which head.

The study has found that users pay the required down payment at the municipality office along with the application form and collect a receipt. Upon receiving the service, total expenditure is generated. Different sizes of the pit or safety tank requires different number of trips and cost is escalated along with the number of trips. There are also some additional costs such as tips and materials (Kerosene generally).

For manual users, those who employ informal emptiers, the cost structure is not defined rather depend on the size of the pit/tank. There is also a subsidised rate for pit user and this is mainly targeted for the poor inhabitants of the municipality. The table below summarises the tariff structure for the various service provision models available in Jhenaidah.

Table 23: Tariff structure for emptying service

Particulars	JM Operated Vacutug		Manual Emptiers
Application Process	Filling application form and submitting to Conservancy department		Calling directly or through middlemen
Fixed Cost	1,000 Liter truck Septic Tank Tk 1,000+150 (15% VAT) Pit: Tk 500+75 (15% VAT)	2,000 Liter truck Septic Tank Tk 1,500+225 (15% VAT) Pit: Tk 700+105 (15% VAT)	Nothing fixed but based on pit size and negotiation. Average: Pit: BDT 600-800 Septic Tank: BDT 2,500-3,000
Variable Cost	Septic Tank • Tk 500 1st trip • Tk 400 2nd to 4th trip • Tk 300 from the 5th trip. Pit • Tk 400 1st trip • Tk 300 for each next trip	Septic Tank • Tk 700 1st trip • Tk 600 2nd to 4th trip • Tk 500 from the 5th trip. Pit • Tk 500 1st trip • Tk 400 for each next trip	Kerosene and other entertainment cost (BDT 200-300)
Payment Method	**Cash**		**Cash**

Perception of Respondents on Tariff

Quite a few vacutug users that were interviewed expressed that the tariff seemed a bit on the higher end for them, although they did not say that they would withdraw from using vacutug service due to this. More than 50% of the non-users also mentioned that the cost of manual emptying is also on the higher side according to them.

Paying Behaviour in Case of Emergency

Respondents of the study have indicated that during emergency, cleaning is considered as primary objective. If the situation forces them to pay more than the usual then there is a willingness to pay more. The general willingness to pay more for users is around 15% more than the prescribed price.

Perception on Payment Method and Modality

Both users and non-users' preferred method is one time cash payment. The concept here is to quickly avail the service without the hassle of running to bank or multiple offices. For manual cleaning, the payment method and modality is also one time cash payment. This suits both the respondents and the emptiers. There was no evident difference when the findings were broken down to relatively poor and non-poor respondent's preference.

Perception about Paying Annual Taxes for FSM

The concept present in Jhenaidah is that if the government imposes taxes then they will have to pay it. However, depending on the income level the payable amount changes. Relatively poor respondents would not want to pay more than BDT 100 annually, while non-poor respondents are willing to pay up to BDT 297 annually. The average willingness to pay found among users was BDT 308 and for non-users it was BDT 215.

4.1.6 Willingness to Pay for FSM

A major focus of this study is to find out the willingness to pay (WTP) for emptying service, more specifically for safe emptying service using vacutug machines. As mentioned before, Choice-based Conjoint analysis technique was used to extract customer's willingness to pay use the service in relationship to what he/she is getting in return. The various essence of the service attributes such as service time-lag, preferred service receiving time, preferred payment mode were presented to the respondents and their preferred views were noted. Additionally, respondents were also asked about the amount they are willing to pay for the actual service provision model that exists in their respective city. Both users and non-users of vacutug service were subjected to the same questions.

The table below captures the results garnered from the above-mentioned investigation:

Table 24: Preferred service provision elements of both users' and non-users' (in % of respondents for each group)

	User	Non-user
Preferred service time-lag		
12 Hours	60.00%	65.00%
24 Hours	40.00%	25.00%
36 Hours		5.00%
48 Hours		5.00%
Preferred time of receiving the service		
Day Time	73.00%	10.00%
Night Time	13.00%	80.00%
Indifferent	14.00%	10.00%

Preferred communication method		
Physical application	26.00%	10.00%
Apply through mobile/Phone	67.00%	80.00%
Service booth/Sub-centres	7.00%	10%
Physical application		
Apply through mobile/Phone		
Preferred mode of payment		
One shot	100.00%	90.00%
Installment		10.00%
Others		
Preferred payment method		
Cash	100.00%	100.00%
Bank draft		

The table above illustrates complete view of preference of user or non-user. In case of time-lag concern, majority of the user and non-user want this service within 12 hours. Furthermore, rest of the users and non-user want this service within 24 hours. In case of preferred time of receiving it, most of the vacutug users don't have any problems about receiving the service in day time since there is no smell or visibility of sludge. However, respondents who used manual emptying service preferred night time for the emptying work.

In case of application process, majority portion of user and non-user want to access the service through mobile or telephone service. Only few of our respondents consider application by going to the office favourably. Furthermore, both vacutug users and manual users want to pay for the service in cash and don't want any additional hassles.

Subsequently, both users and non-users were briefed about the service provision model for vacutug based emptying service that exists in their city and told to express their interest in availing the service and in what price range.

The table next page captures the WTP of both users and non-users for their preferred service setup and for the actual service provision model being practices in JM:

Table 25: Willingness to pay of respondents by category

Respondent Type	Average WTP for preferred service provision	Average WTP for actual service provision
Users	BDT 3,060	BDT 2,575
Non-users	BDT 2,120	BDT 1,860
Total Average (user+non-user)	BDT 2,840	BDT 2,217
Relatively Poor	BDT 2,678	BDT 2,250
Non-poor	BDT 2,850	BDT 2,500
Pit User	BDT 1,100	BDT 875
Septic Tank User	BDT 4,250	BDT 2,050

Note:

i. Preferred service refers to the combination of the total service provision that the respondents preferred
ii. Actual service refers to the service provision model available in their respective CC/ Municipality
iii. The monetary figures denote total willingness to pay for service provision and not per trip or capacity of emptying.

From the table above, it can be seen that users in Jhenaidah are willing to spend BDT 3,060 on average for availing the vacutug Service, if it is catered according to their preferred service modality. Naturally the interest drops when the payment is for the actual service provision present in JM. Thus there may be room for improvement in the service delivery mechanism. In the case of non-users, the above mentioned gap is considerably less when the same aspect is looked into.

However, the gap in willingness to pay is also significant when users and non-users are compared. The gap suggests that users are reasonably satisfied with the service provision and value the Vacutug service more than those who have not used it.

When comparison is done between relatively poor and non-poor HHs, the gap is not that significant. It suggests that poor HHs also understand the value of the vacutug machine and are willing to pay a considerable amount to avail this service.

From table 27, it can also be seen that septic tank users have high WTP, if the service provision is received according to their need. However, for the current service provision, they are prepared to pay much less than they would be interested to pay if all their service needs were fulfilled. In the case of pit users, the WTP is markedly less than septic tank users.

4.2 ANALYSIS OF SERVICE PROVISION FOR EMPTYING SERVICE

In Jhenaidah Municipality (JM), there are broadly 2 types of service providers for faecal sludge management. JM itself is a major service provider with their fleet of 2 vacutugs. There are also the bevies of manual emptiers (belonging to the Harijan Community) providing emptying service for generations. To obtain information about the service provision models, KIIs were conducted with senior and operational level officials of both KCC and CDC and also with traditional manual emptiers.

4.2.1 Vacutug-based Mechanical Emptying Service

Service Provision Model

As mentioned before, Jhenaidah Municipality has a total of 2 vacutug machines rendering service to the inhabitants under JM. Prospective customers submit an application to municipality along with cash. Conservancy authority employs teams and allocates work to the teams.

Vacutug Machine of Jhenaidah Municipality

The conservancy official claimed that the time-lag between call and service delivery is usually 24-36 hours. Their most busy times are in the rainy season when they may get as much as 25 requests per month and in other 7-8 months they get around 10-15 calls per month. Thus, in a year, they receive around 200 calls (approx.). According to the officials, they can currentlyuse one-third of the total capacity that they can offer. JM can accommodate around 600 calls per year with their current fleet. Thus, concerted efforts are needed to popularise the service even further.

The tariff structure has already been delineated in section 1.5 of Jhenaidah chapter. The JM is currently earning around BDT 25,000-30,000 a month in revenue by providing this service.

Problems in Service Delivery

In terms of service delivery, the following problems were mentioned by the JM officials and operational level staff. The broad reasons are mentioned below:

- Lack of skilled manpower and retention of trained employees. After receiving training, some employees don't continue.
- Truck not managing to access certain areas – mainly due to narrow roads which entails that the truck can't get close enough for the suction pipe to reach the pit/tank.

- Proper clothing – only two sets of protective gear available. Operational staff and emptiers attached with the vehicles expose themselves to health risks.

JM officials also stated some reasons why the service is not as popular as expected. The most significant reason is lack of awareness about the existence of the service and lack of knowledge about the functional use of the vacutug machine. The other reason noted was the complexity of reaching the location of operation due to narrow roads and buildings standing close to each other blocking any entrance. Hence preventing vacutug trucks to reach the pit/tank conveniently. Furthermore, there is no dedicated FSM wing under the JM organogram and FSM is tagged with conservancy department. A separate FSM unit would be good to improve coordination and service delivery of the Vacutug service.

Profiling of Customers Availing Vacutug Service

The officials of JM also mentioned that both lower income group and non-poor group of people call for the Vacutug service, but the calling rate is high among non-poor group of people.

Perception of Service Providers about Tariff Structure

The service providers mentioned that tariff structure currently in place is justified and customers wanting to avail the service should have the ability and the appetite interest to try something new and efficient.

Initiatives for Service Promotion

JM has undertaken various promotional strategies to make the vacutug service popular. Firstly, the JM has plans to organise a workshop including the customers and all other value chain actors to talk about the vacutug service and emphasise the benefits of availing the service, both at HH and broader society level. The JM has conducted street dramas to raise awareness about the use of vacutug.

Future Plans for Improvement in Service Quality, Delivery and Recommendation from Service Providers

After discussion with senior management of Jhenaidah Municipality, it was ascertained that they have no immediate plans to deregularise the market, i.e. allow private sector to provide FSM service using their own business models. However, JM officials also mentioned that discussion has been initiated about whether FSM can be privatised and a feasibility study is going on to assess the implications and benefits.

JM officials also mentioned that there is no dedicated wing for FSM service provision in the organogram and the unit operates under conservancy wing with a lot of other responsibilities. Thus, a dedicated wing for FSM in the JM structure would make service provision much smoother. Furthermore, a proper treatment plant for sludge management would be beneficial in the long run and treatment of sludge is as important as emptying of sludge. Indiscriminate dumping of faecal sludge in drains and canals should also be monitored and stopped and illegal lines should be identified and closed.

4.2.2 Informal Emptying Service by Manual Emptiers

JM has around 60-70 traditional manual emptiers, plying their trade for generations. They are not just involved in FSM but any types of cleaning work, that entails physical contact or close proximity to garbage and waste. For their job nature, they are often seen lowly in society and find it difficult sometimes to mingle and integrate with the "common" people.

According to informal emptiers, HHs only seek their service only when the HH's pit is overflowing with faecal sludge. There is little to no proactive cleaning of the faecal pits by the building owners. Emptiers also noted that January to March is the peak season for them as there are more demands by HHs to clean their pits or tanks. Furthermore, they also mentioned that middle to upper class citizens make the biggest chunk of informal emptying service consumers.

Service Provision Model of Manual Emptiers

Most of the emptiers wait in front of municipality office for customers. People come to them and hire them for emptying service. In some case, people directly come to their living quarters and hire them based on availability. In most cases, they give this service instantly. However, in busy season they try to render their service within 24 hours. Usually, they only use spade and bucket as an emptying gear. They do not use any types of safety gear such as gloves, special dress for emptying. They charge around BDT 2,500-3,000 for septic tank and anything between BDT 600-1,000 for pits depending on size.

This study has found that manual emptiers are still valued for FSM since they can render their services quickly and relatively cheaply. Proper removal of sludge is the other important criteria which they think they have an advantage over the Vacutug, since the latter can't always clean the hard sludge at the bottom of the pit/tank.

Perception about Mechanical Service and Scope of Integration

Manual emptiers opined that they have witnessed an increase in the uptake of mechanical emptying service in the last year or so and that makes them a bit uncomfortable, if not immediately threatened. They also feel that since vacutug has its limitations and that they can react quickly to a customer demand, they will still be sought after. However, in the long run, the dynamics may change.

The manual emptiers also mentioned that if given the opportunity and support, they would like to get integrated with the mechanical emptying system in whatever capacity they are deemed fit. They acknowledged that manual emptying process is not the cleanest and safest. If market for mechanical emptying is expanded, it will be beneficial for the environment and for themselves as well. They would want to improve their working conditions. Therefore, integrating with vacutug service doesn't seem like a bad idea to them. However, they would need financial and technical support (training and orientation) and the opportunity to make a living through rendering this service. According to the emptiers, shifting to mechanical emptying service will increase their social status in the eyes of the community they live and benefit them financially too.

4.3 RECOMMENDATIONS FOR SERVICE PROVIDERS ON EFFICIENT FSM VALUE CHAIN

4.3.1 Service Quality Improvement

- Since the municipality is operating at one-third capacity, there is no urgent need to add to the fleet of vacutug vehicles immediately. However, if demand trend increases, then 1 larger capacity truck of either 3,000 liter or 5,000 liter can be obtained in the future. The 5000 liter truck should mostly be used to service big volume or institutional customers.
- Provide training and proper gear for the operational staff involved with FSM. Proper gear would motivate workers to conduct their job properly and also be beneficial for their personal health.
- Undertake greater promotional activities through enlistment of facilitation by CBOs and NGOs, to increase awareness about the service and increase calls.
- Arrange for regular training of operational staff involved with FSM. Training manuals need to be developed which will act as a guide for all future training for the staff.
- Launch awareness campaigns targeting to increase awareness among people. Mosques and Schools could be a good platforms where awareness campaigns may be focused due to possibility of reaching large number of people. Facilitation of CBOs or NGOs could be considered for this endeavor.
- Establish dedicated FSM unit in the JM organogram.

4.3.2 Tariff Structure

From field investigation, it was seen that average willingness to pay by customers in JM is around BDT 2,840 (for both users and non-users), whereas non-poor HH had an average willingness to pay BDT 2,850. The relatively poor HHs had willingness to pay BDT 2,678. Comparing with the tariff structure as shown in section 1.5, it can be seen that willingness to pay is higher than what the municipality is charging right now.

Thus there is some room to increase the present tariff structure. The table below provides a proposed tariff structure and capacity utilization to achieve at least break even.

Table 26: Proposed tariff structure of Jhenaidah Municipality

Particulars	Truck Size	
	1,000 liter	2,000 liter
Revenue Details		
Trips per year	500	300
Average Tariff Per trip (excluding VAT)	• BDT 1,600 for septic tank • BDT 500-700 for pit	• BDT 1,800 • BDT 500-700 for pit
Total Revenue	BDT 800,000	540,000
Grand total revenue	BDT 1,340,000	

Cost Details		
Driver(2x1)	BDT 216,000	BDT 216,000
Emptiers (2x2)	BDT 240,000	BDT 240,000
Fuel cost	BDT 200,000	BDT 120,000
Maintenance cost	BDT 30,000	BDT 50,000
Grand Total Cost	BDT 1,312,000	

Assumptions:

- Since JM has the capacity to entertain 600 calls per year, it is assumed that they can at least manage 400 calls per year-average number of trips has been assumed to be 800 (2 per call), considering multiple trips from the vacutugs in some calls.
- Fuel cost assumed to be BDT 400 per round trip.
- The charge for pit should be determined based on distance requirement and fuel cost.

From the table above it can be seen that increasing the number of calls and trips is key to not only achieving breakeven but also managing to cater to a large number of people than before. Thus the key focus for JM would be to increase their customer base. The proposed tariff structure is a slight appreciation from the previous structure for both capacities of trucks. Although customer willingness to pay shows that there is more room to increase the tariff, but at this point increasing the customer base should take precedence over profit motive. Currently there is no urgent need to propose another rate for the poor but a lump sum discount (20-30%) on the total amount can be given for a period of 6-9 months, on trial basis. However, deciding on who is poor and non-poor could be challenging and many non-poor people may actually claim to be poor, just to enjoy the subsidy benefits. Thus any such imitative needs to be carefully handled and monitored.

4.3.3 Scope for Privatisation

The KM is running the vacutug operation at below capacity. Thus allowing private sector operators at this juncture may not be prudent. However with increasing demand, the JM might struggle to cater to the needs of the residents effectively. At that point, private sector entities may be given license to operate as the market grows.

4.3.4 Roles and Responsibilities of Stakeholders

One of the main reasons for the failure of FSM systems is the overlapping and unclear allocation of responsibilities and a lack of incentives for efficient operation. This situation frequently occurs where an incomplete institutional framework exists leading to a lack of accountability and disagreements between stakeholders. Since the entire service chain is interlinked, each aspect influences another and it is essential that the roles and responsibilities are clearly defined. Thus, coordinating the link between each step in the chain is essential to ensure a successful FSM system. The distribution of the responsibilities among the stakeholders should be decided taking into account the intrinsic strengths and weaknesses of each stakeholder involved in the service chain. Incremental improvements can be facilitated either through capacity building or reorganisation of different stakeholders. The table next page depicts the proposed roles and responsibilities of each of the stakeholders, in order to make the FSM value chain more effective:

Table 27: Willingness to pay study

Stakeholders	Laws	Coordination	Collection & Transport	Treatment	Resource Recovery	Enforcement	Training & Information	Monitoring
Ministries	✓	✓				✓	✓	✓
City Corp. or Municipality		✓	✓	✓	✓	✓	✓	✓
Law Enforcers						✓		
Pvt. Companies			✓	✓	✓			
NGOs		✓					✓	✓

The table below describes the possible advantages and disadvantages of the stakeholders:

Table 28: Proposed tariff structure of Jhenaidah Municipality

Stakeholder	Advantage	Drawback	Needs
City Corp/ Municipality	• Ability to provide subsidies • Enforcement less complex • Ability to absorb loss in the initial stage • Better chance to tap into donor funds	• Dependency on political situation (e.g. changes of direction with political rearrangements) • Potential low priority level among • Government activities • Time consuming internal procedures and red tape • Low flexibility in tuning service provision according to market needs	• Capacity strengthening • Operating autonomously from national authority • Management and record keeping training
Private companies	• Service Flexibility • Easy contact with customers • Local job creation • Scope for improvement in service quality due to competitive market	• Complexity in coordination with public bodies • Difficulty to accessing subsidies • Less ability to absorb initial losses or shocks • Complexity of coordination • Lack of legal enforcement	• Capacity strengthening • Tax reduction/ Concession for the delivery of public services • Licenses and contracting facilitation • Access to finance at cheap rate

The table above gives a good picture of the advantages and disadvantages of public and private sector service provision. Thus, any attempts at de-regularising the market should take into account the factors mentioned above.

ANNEXURE

ANNEX A- ADDITIONAL DATA TABLES

Study findings- Khulna City Corporation

How much would he be willing to pay for installing new pit/septic-tank

Particular	Pit	Septic Tank
Willing to pay for installing new septic tank (Average BDT)	1,500	37,500

How did they get to know about mechanical service

How did they get know	User		Non-user	
	Frequency	%	Frequency	%
Promotion by City Corp/Municipality	2	15%	3	20.00%
Promotion by NGO	4	31%		
Neighbours	1	8%	5	33.33%
Family members	3	23%		
Others	3	23%	5	33.33%
Did not know			2	13.33%
Grand Total	**13**	**100%**	**15**	**100%**

When was the last time they used emptying service

Last Cleaning (months ago)	User		Non-user	
	Frequency	%	Frequency	%
1-6 months	4	31%	4	33.33%
7-12 months	5	38%		0.00%
13-24 months	2	15%	3	25.00%
More than 24 months	2	15%	5	41.67%
Grand Total	**13**	**100%**	**12**	**100%**

Preferred time of emptying

Preferred time	User		Non-user	
	Frequency	%	Frequency	%
Day	4	31%	2	9.52%
Night	6	46%	17	80.95%
Indifferent	3	23%	2	9.52%
Grand Total	**13**	**100%**	**21**	**100%**

Perception about the application process

Evaluation	User		Non-user	
	Frequency	%	Frequency	%
Very convenient	3	23%	3	18.75%
Convenient	8	62%	9	56.25%
Neutral	2	15%	4	25.00%
Grand Total	**13**	**100%**	**16**	**100%**

Time-lag between service application and receipt

Lag time	User		Non-user	
	Frequency	%		Frequency
0-8 hours	7	54%	9	56.25%
8-24 hours	2	15%	7	43.75%
24-48 hours	1	8%		
48-72 hours	2	15%		
More than 72 hours	1	8%		
Grand Total	**13**	**100%**	**16**	**100%**

Reliance on used service in emergency

Reliance on present service they use	User		Non-user	
	Frequency	%	Frequency	%
Yes	8	62%	15	75.00%
No	5	38%	5	25.00%
Grand Total	**13**	**100%**	**20**	**100%**

Evaluation of service delivery

Evaluation of service delivery	User		Non-user	
	Frequency	%	Frequency	%
Highly satisfied	2	15%	7	41.18%
Satisfied	7	54%	1	5.88%
Indifferent	2	15%	5	29.41%
Highly dissatisfied	2	15%	4	23.53%
Grand Total	**13**	**100%**	**17**	**100%**

Preferences behind users' choice of mechanical service over manual service

Attributes	Frequency
Prestige issue and respect enhancement in society	3
Family, child health & hygiene	10

Preventing pollution of canals, rivers overall environment and risk to human health	10
Prevention of smell and disgust	11
Peer pressure (friends or family or neighbours)	
Encouragement/Pressure from health authority/Local government	1
Other	1

Reasons non-users have not opted for mechanical cleaning during your last requirement

Reasons	**Frequency**	**%**
Did not know at the time	8	50 %
Too expensive	1	6 %
Too complicated availing process	1	6 %
It was an emergency hence required tried and tested method	1	6 %
Others	5	32 %
Grand Total	**16**	**100%**

Reasons non-users prefer mechanical service over manual service in next time

Attributes	**Frequency**
Prestige issue and respect enhancement in society	13
Family, child health & hygiene	16
Preventing pollution of canals, rivers overall environment and risk to human health	15
Prevention of smell and disgust	11
Peer pressure (friends or family or neighbours)	1
Encouragement/Pressure from health authority/Local government	1
Cost Considerations or Subsidy	2

Perception of non-users about manual emptying service

Perception	**Frequency**	**%**
Favourable	4	19%
Neutral	3	14%
Not favourable	14	67%
Grand Total	**21**	**100%**

Favored payment mechanism - Users

	No.	**%**
One Shot	12	92%
Installment	1	8%

Willingness to pay annual FSM TAX

Respondent	Amount in BDT
User	310
Non-user	400
Relatively poor	200
Non-poor	390

Study findings- Kushtia Municipality

Particular	Pit	Septic Tank
Willing to pay for installing new pit/septic tank (BDT)	1,200-1,500	45,000-60,000

How did respondents get to know about mechanical service

How did they get to know	User		Non-user	
	Frequency	%	Frequency	%
Promotion by City Corp/ Municipality	10	77%	1	5 %
Neighbours	3	23%	10	50 %
Family members			1	5 %
Others			5	25 %
Did not know			3	15%
Grand Total	**13**	**100%**	**20**	**100 %**

When was the last time they used emptying service

Last Cleaning (months ago)	User		Non-user	
	Frequency	%	Frequency	%
1-6 months	4	31%	4	33.33%
7-12 months	2	15%		0.00%
13-24 months	3	23%	3	25.00%
More than 24 months	4	31%	5	41.67%
Grand Total	**13**	**100%**	**12**	**100%**

Emptying behaviour of the society

Row Labels	No.	%
Proactively	1	8%
Emergency	12	92%
Grand Total	**13**	**100%**

Preferred sludge cleaning time

Preferred time	User		Non-user	
	Frequency	%	Frequency	%
Day	6	46%	13	65.00%
Night	5	38%	5	25.00%
Indifferent	2	15%	2	10.00%
Grand Total	**13**	**100%**	**20**	**100%**

Evaluation of the process of application for vacutug

Evaluation	User		Non-user	
	Frequency	%	Frequency	%
Very convenient	3	23%	4	28.57%
Convenient	2	15%	5	35.71%
Neutral	2	15%	2	14.29%
Difficult	6	46%	3	21.43%
Grand Total	**13**	**100%**	**14**	**100%**

Time-lag between service application and receipt

Lag time	User		Non-user	
	Frequency	%		Frequency
0-8 hours			5	55%
8-24 hours	5	38%	6	45%
24-48 hours	1	8%		
48-72 hours	3	23%		
More than 72 hours	4	31%		
Grand Total	**13**	**100%**	**11**	**100%**

Reliance on used service in emergency

Reliance on present service they use	User		Non-user	
	Frequency	%	Frequency	%
Yes	6	46%	11	61%
No	7	54%	7	39%
Grand Total	**13**	**100%**	**18**	**100 %**

Evaluation of service delivery

Evaluation of service delivery	User		Non-user	
	Frequency	%	Frequency	%
Highly satisfied	3	23%	2	15.38%
Satisfied	4	31%	5	38.46%
Indifferent	1	8%	3	23.08%
Highly dissatisfied	5	38%	3	23.08%
Grand Total	**13**	**100%**	**13**	**100%**

Preferences behind users' choice of mechanical service over manual service

Attributes	Frequency
Prestige issue and respect enhancement in society	6
Family, child health & hygiene	11
Preventing pollution of canals, rivers overall environment and risk to human health	9
Prevention of smell and disgust	11
Peer pressure (friends or family or neighbours)	1
Encouragement/Pressure from health authority/Local government	1

Reasons non-users have not opted for mechanical cleaning during their last requirement

Reasons	Frequency	%
Did not know at the time	7	39%
Too expensive		
Too complicated availing process	2	11%
It was an emergency hence required tried and tested method	5	28%
Others	4	22%
Grand Total	**18**	**100%**

Reasons non-users prefer mechanical service over manual service in next time

Attributes	Frequency
Prestige issue and respect enhancement in society	5
Family, child health & hygiene	14
Preventing pollution of canals, rivers overall environment and risk to human health	11
Prevention of smell and disgust	14
Peer pressure (friends or family or neighbours)	4
Encouragement/Pressure from health authority/Local government	4
Cost Considerations or Subsidy	1

Perception of non-users about manual emptying service

Perception	Frequency	%
Favourable	2	11%
Neutral	4	22%
Not favourable	12	67%
Grand Total	**18**	**100%**

Preferred payment mechanism - Users

Row Labels	No.	%
One Shot	13	100%
Installment	-	-
Grand Total	**13**	**100%**

Willingness to pay annual FSM Tax

Respondent	Amount in BDT
User	450
Non-user	209
Relatively poor	220
Non poor	435

Study findings- Jhenaidah Municipality

How much would they be willing to pay for installing new pit/septic tank

Particular	Pit	Septic Tank
Willing to pay for installing new pit/septic tank (Average BDT)	1,200-1,500	43,750

How did they get to know about mechanical service

	User		Non-User	
	Frequency	%	Frequency	%
Promotion by City Corp/Municipality	13	87	3	20
Neighbours	2	13	5	33
Others			5	33
Did not know about mechanical emptying service at all			2	13
Total	**15**		**15**	

When was the last time they used emptying service

Last cleaning (months ago)	User		Non-User	
	Frequency	%	Frequency	%
1-6 months	11	73	4	33
7-12 months	3	20		
13-24 months	1	7	3	25
More than 24 Months			5	41
Total	**15**		**12**	

Preferred sludge cleaning time

Preferred time	User		Non-User	
	Frequency	%	Frequency	%
Day	11	73%	6	30.00%
Night	2	13%	13	65.00%
Indifferent	2	13%	1	5.00%
Grand Total	**15**	**100%**	**20**	**100%**

Evaluation of the process of application

Evaluation	User		Non-User	
	Frequency	%	Frequency	%
Very convenient	5	33%	4	33.33%
Convenient	9	60%	7	58.33%
Difficult	1	7%		
Neutral			1	8.33%
Grand Total	**15**	**100%**	**12**	**100%**

Time-lag between service application and receipt

Lag time	User		Non-User	
	Frequency	%	Frequency	%
0-8 hours	1	7%	8	66.67%
08-24 hours	8	53%	1	8.33%
24-48 hours	4	27%	2	16.67%
48-72 hours	1	7%	1	8.33%
More than 72 hours	1	7%		
Grand Total	**15**	**100%**	**12**	**100%**

Reliance on the service provision in emergency situation

Reliance on mechanical service	User		Non-User	
	Frequency	%	Frequency	%
Yes	11	73%	16	94.12%
No	4	27%	1	5.88%
Grand Total	**15**	**100%**	**17**	**100%**

Evaluation of service delivery

Evaluation of service delivery	User		Non-User	
	Frequency	%	Frequency	%
Highly satisfied	4	27	2	13
Satisfied	5	33	6	40
Indifferent	1	7	1	7
Dissatisfied	5	33	5	33
Highly dissatisfied			1	7
Total	**15**		**15**	

Views on manual service

Particulars	User		Non-User	
	Frequency	%	Frequency	%
Favorable	2	13	4	19
Neutral	6	40	3	14
Not favorable	7	47	14	67

Why did users choose mechanical service over manual service

Preference	Frequency
Prestige issue and respect enhancement in society	6
Family, child health & hygiene	10
Preventing pollution of canals, rivers overall environment and risk to human health	13
Prevention of smell and disgust	14
Peer pressure (friends or family or neighbours)	2
Encouragement/Pressure from health authority/Local government	3
Other	1

Emptying behaviour of the society

	User	
	Frequency	**%**
Proactively	2	13%
Emergency	13	87%

Preferred payment mechanism

Payment System	**User**		**Non-User**	
	Frequency	**%**	**Frequency**	**%**
One Shot	15	100%	12	100
Instalment	0	0%		

Perception on tariff structure

	User		**Non-User**	
	Frequency	**%**	**Frequency**	**%**
Justified	6	40	7	58
Neutral	3	20		
Unjustified	6	40	5	52
Total	**15**		**12**	

Willingness to pay annual FSM tax

Respondent	**Amount in BDT**
User	308
Non-user	215
Relatively poor	100
Non-poor	297

ANNEX B- RESPONDENT LIST

Respondents list of vacutug users and manual users:

SL No	Name	Location
Vacutug Service Users-Khulna		
1	Taj Mohammad	Khulna
2	Santo Das	Khulna
3	Dipali	Khulna
4	Tayebur Rahman	Khulna
5	Tomjida banu	Khulna
6	Rawsan Ara	Khulna
7	Mala	Khulna
8	Md. Jhunu miha	Khulna
9	Md. Jewel	Khulna
10	Sakib Mamunr Rahman	Khulna
11	Rokea begum	Khulna
12	Jumana Parvin	Khulna
13	H M Islam Istiak	Khulna
Manual Service Users-Khulna		
14	Mr. Roxy	Khulna
15	Hazi Md. Mosharraf	Khulna
16	Mr. Delwar Hossain	Khulna
17	Nasir Bapari	Khulna
18	Md. Nazrul Gazi	Khulna
19	Mr. Sultan	Khulna
20	Md. DelowerHossain	Khulna
21	Md. Ibrahim	Khulna
22	Km Rokon Uddin	Khulna
23	Nurul Amin	Khulna
24	Mr. Obaidulla	Khulna
25	Istiak Ahmed	Khulna
26	Alhaz Bashir Mollah	Khulna
27	Jahangir Kabir	Khulna
28	Wahed Khan	Khulna
29	Md. Aher Ali	Khulna
30	Shafiul Azam	Khulna
31	Shickh Abdur Rashid	Khulna
32	Nazrul islam	Khulna

SL No	Name	Location
33	Omar Faruk	Khulna
34	Md. Abu Suyeel	Khulna
Vacutug Service Users-Kushtia		
35	Mrs. Surovi	Kushtia
36	Md. Abdus Shukur	Kushtia
37	Abdul Jalil	Kushtia
38	Badhan Mohibul Islam	Kushtia
39	Nasima Pervin	Kushtia
40	Md. Saiful Islam	Kushtia
41	Md. Farhad Hossain	Kushtia
42	Mr. Kazi Tomato	Kushtia
43	Nazma Begum	Kushtia
44	Yasmin Hossain	Kushtia
45	Sirajul Alam	Kushtia
46	Jeebon Sheikh	Kushtia
47	Abdul Mannaf	Kushtia
Manual Service Users-Kushtia		
48	Rabbir Safa	Kushtia
49	Md. Selim	Kushtia
50	Airine Pervin	Kushtia
51	Md. Hater Ali	Kushtia
52	Mst. Doly	Kushtia
53	Rozina	Kushtia
54	Md. Khalil Sheikh	Kushtia
55	Md. Rohomot Ali	Kushtia
56	Kazi Noor A. Hasan	Kushtia
57	Md. Saleh Ahmed	Kushtia
58	Abu Saleh	Kushtia
59	Akter Banu	Kushtia
60	Mukti Begum	Kushtia
61	Mostag Ahmed	Kushtia
62	Anisur Rahman	Kushtia
63	Kabir Uddin Bacchu	Kushtia
64	Nurul Islam	Kushtia
65	Shirajul Islam	Kushtia
66	Yasmin Begum	Kushtia
67	Saleha Khatun	Kushtia

SL No	Name	Location
Vacutug Service Users-Jhenaidah		
68	Munshi Mostafizur Rahman	Jhenaidah
69	MD. Asadul Alam	Jhenaidah
70	Israel Hossain	Jhenaidah
71	Ekramul Haque	Jhenaidah
72	Aminur Rahman	Jhenaidah
73	Ferdousi Islam	Jhenaidah
74	AKM Hatem Ali	Jhenaidah
75	Abdullah Al Mamun	Jhenaidah
76	MD.Tuta Mia	Jhenaidah
77	Jahidul Islam	Jhenaidah
78	Golum Rasul	Jhenaidah
79	Rezaul Karim	Jhenaidah
80	Abdul Khalek	Jhenaidah
81	Reshma Khatun	Jhenaidah
82	MD. Tofazzul Hossain	Jhenaidah
Manual Service Users-Jhenaidah		
83	Solemon Biswas	Jhenaidah
84	Abu Bakar siddique	Jhenaidah
85	Jahidul Islam	Jhenaidah
86	Md. Mokhlesur Rahman	Jhenaidah
87	Sondha Rani Biswas	Jhenaidah
88	Ashim Kumar Mitra	Jhenaidah
89	Md. Ahad	Jhenaidah
90	Md. Moazzem Hossain	Jhenaidah
91	Ranjana Sarkar	Jhenaidah
92	Porimal Chandra Dey	Jhenaidah
93	Mahfujur Rahman	Jhenaidah
94	Salma Khanam	Jhenaidah
95	Suman Biswas	Jhenaidah
96	Mohammed Abu Bakar	Jhenaidah
97	Mohammed Wajed ali	Jhenaidah
98	Md. Anwar Hossain	Jhenaidah
99	Timir Dey	Jhenaidah
100	Pijusj Kanti Roy	Jhenaidah
101	Pankaj Biswas	Jhenaidah
102	Md. Ekram Hossain	Jhenaidah

Senior Management:

SL No	Name	Designation	Address
1	Anwar Hossain	Conservancy Dealing Assistant	Khulna City Corporation
2	Anisur Rahman	Conservancy Officer	Khulna City Corporation
3	Ranver Ahmed	Town Planner	Kushtia Municipality
4	Jahurul Islam	Conservancy Officer	Kushtia Municipality
5	Khandakar Mohibul Islam	Conservancy Officer	Kushtia Municipality
6	Md. Shamsul Alam	Conservancy Officer	Jhenaidah Municipality
7	Md. Kamal Ahmed	Assistant Engineer, Conservancy Department	Jhenaidah Municipality

Operational Force:

SL No	Name	Address
1	Sohan Biswas, Driver	Kushtia Municipality
2	Rajib Bashfor, Labor	Kushtia Municipality
3	Md.Shonaullah	Jhenaidah Municipality
4	Ranjan Dash, Driver	Khulna City Corporation
5	Nipu, Helper	Khulna City Corporation

Manual emptier - Informal

SL No	Name	Address
1	Bivishom Dash	Kashipur, Jamunar Gate, Khulna
2	Ranajit Dash	Kashipur, Jamunar Gate, Khulna
3	Porimal Dash	Soan danga, solar park, Sweeper Colony
4	Badol Bashfor	Pach rastar mor, shapla chattar, Kushtia
5	Chand	GK sweeper colony, Kushtia
6	Nirapodo Dash	Chaklapara Colony, Jhenaidah
7	Santosh	Chaklapara Colony, Jhenaidah

ANNEX C- RESEARCH TOOLS

Willingness to Pay for Safe Emptying Service

Questionnaire for Service Providers (Informal/Manual emptier)

Name	
Location	**Khulna** ☐ **Jhenaidah** ☐ **Kushtia** ☐
Type of Service Provider	

City Corporation	
Pourashava	
CBO/NGO	
Private Entity	
Others (mention)	

Designation of Interviewee	
Years in service	
Address	
Contact no	

General Information

1. In which season/months do households prefer to conduct emptying action?
2. Do HHs here conduct emptying proactively or only when faced with emergency or overflow?
3. For how many years have you been providing emptying service? Are you part of a community that traditionally provides this service? *(Don't ask directly but try to figure out if he belongs to a Harijon community or not)*

Service Provision Model

How they are contacted	
Time-lag from being called to providing the service	
Gear/Instruments they use	
Total Cost to provide the service for the provider	
Service Charge (how they price their customers) and total cost	
How many calls per week or month?	
Manpower requirement (does he do it alone or has any helpers/assistants?)	
Mode and Method of Payment	

4. Which **segment** of the citizens are your biggest customers?
   - Poor or Non-poor
   - Slum or Non-slum
   - Rural or Urban (if rural then ask why the shift?)

5. Why do you think they prefer your service?

   Areas to focus:
   - Cost
   - Convenience and availability
   - Lack of awareness in mechanical emptying
   - Application procedure less complex

Perception about mechanical emptying service

6. Have you heard of vacutug based mechanical service provision? What is your opinion about that?

Pros	***Cons***

7. DO you have any idea about the **cost structure** of mechanical emptying services? (if yes, then take down what he knows)
8. Do you feel threatened by the arrival of mechanical emptying service in your city? Why or why not?
9. To what extent would you be **willing to shift to mechanical emptying system?**
10. If you want to shift will it be as paid cleaners for someone (govt, pvt. sector) or as entrepreneur?
11. What kind of support would you need for the shift?

Financial (Loans, Startup Capital etc. and Source of Finance)	
Technical (Training)	
Social (Overcome stigma, Gain acceptance etc.)	

12. To what extent do you think shifting to mechanical emptying will improve your income and livelihood status?
13. To what extent do you think shifting to mechanical emptying will uplift your social status?

Questionnaire for Operational Force (of Municipality/City Corp)

Name	
Location	**Khulna** ☐ **Jhenaidah** ☐ **Kushtia** ☐
Type of Service Provider	City Corporation ☐ Pourashava ☐ CBO/NGO ☐ Private Entity ☐ Others (mention) ☐
Designation of Interviewee	
Years in service	
Address	
Contact no	

General Information

14. In which season/months do households prefer to conduct emptying action?
15. Are you a **permanent or non-permanent** worker?
    - Permanent
    - Non-Permanent

16. **Do you perform any other service while giving FSM service** (do they do the work from beginning to end, e.g. do they dig the hole, break in the tank, dispose and repair the tank themselves or only clean)?

17. Do HHs here conduct **emptying proactively** or only when faced with emergency or overflow?

Emptying Services Evaluation

18. What is your opinion/comment about the following?

Opinion about vacutug service/mechanical emptying?	<table><tr><th>PROS</th><th>CONS</th></tr><tr><td></td><td></td></tr></table>
How do your service provider (Municipality/City Corp) **communicate with you** when they get an order?	
Time-lag to provide service from order? Reasons.....	
Provide complete solution or Partial? Reasons.....	
Can you provide smooth service with your existing team?	
Do you take any service charge beyond prescribed rate?	

19. Which segment of the citizens are mostly subscribing to mechanical emptying options?

Comparison Areas

- Poor or Non-poor or Middle Class
- Slum or Non-slum
- Owners or Tenants

20. Is there any specific areas/communities which you cannot access/ provide service on time or efficiently?
    - Which area are those?
    - Why not?
21. How much does it cost to avail vacutug service? (take basic cost breakdown)
22. Do you think the tariff srtucture for mechanical emptying is justified? Is there a need to change/ amend the tariff/cost structure?
23. What are the major problems /bottlenecks regarding service delivery of FSM?

Probing Areas	Problems	Solutions
Lack of skilled manpower		
Lack of adequate manpower to provide service (drivers, cleaners, sweepers)		
Lack of enough vehicles to give proper service		
Truck not managing to access certain areas (slums, narrow roads)		
Sludge management/Dumping		
Proper clothing/Protective gear? Is that adequate?		
Others		

Questionnaire for Service Providers (Senior Management)

Name	
Location	**Khulna** ☐ **Jhenaidah** ☐ **Kushtia** ☐
Type of Service Provider	City Corporation ☐ Pouroshava ☐ CBO/NGO ☐ Private Entity ☐ Others (mention) ☐
Designation of Interviewee	
Years in service	
Address	
Contact no	

General Information

1. How many households reside under this City/Pouroshava/NGO working area?
2. What is the current sanitation infrastructure in the City/Pouroshava?

Type	Percentage (approx.)
Sewerage system	
Closed pit/Septic tank	
Open pit	
Basic toilet with waste going to directly to drains. canals, rivers	
Open defecation	

3. What is the prevalent/existing behaviour among HHs for emptying service?

Type	Percentage (approx.)
Manual emptying	
Mechanical emptying	
No initiative for faecal sludge management	
Others (mention)	

4. Which department/project in this organization is responsible for emptying service in this area?
5. How many workers/staffs are there in this department (permanent-non permanent)?
   - Permanent
   - Non-Permanent
6. Are there any regular charges/taxes/fees that HHs here pay for FSM?
7. DO HHs understand the importance of safe emptying and disposal of faecal sludge?
8. Do HHs here conduct emptying proactively or only when faced with emergency or overflow?
9. In which season/months do HHs prefer to conduct emptying action?

Service Provision Model

10. Does your organization provide mechanical emptying service? What is the service provision modality?

Points to Note:

- Application System
- Trucks/Vehicles
  - Number of trucks
  - Specification/suction capacity of trucks
  - Total manpower
  - Composition of cleaning team (driver, assistant, cleaner, supervisor etc.)
  - Source of fund for trucks-donor fund or own fund
  - Average Number of calls per week (if not possible in week then in month)
  - What % of current service provision capacity is being used?

- Present tariff structure
  - Fixed cost (down payment, lease cost etc.)
  - Variable cost
  - Other cost
  - Tariff structure high or low or appropriate (comments to be collected)
  - Subsidy details (if any)
- Payment Method and payment options
- Time-lag between call for service and service delivery
- Promotional strategy - what are they doing to make the service more popular among residents?

Note: *Please ask respondents whether service providers provide 360 degree/complete solutions. Whether they provide additives such as bleaching powder or provide after cleaning services, if required.*

11. What are the major problems/bottlenecks regarding service delivery of Mechanical Emptying service

Probing Areas	Problems	Solutions
Lack of skilled manpower		
Lack of adequate manpower to provide service (drivers, cleaners, weepers)		
Lack of enough vehicles to give proper service		
Truck not managing to access certain areas (slums, narrow roads) - take note of specific areas or group of people		
Sludge management/Dumping not properly managed		
Proper clothing/Protective gear? Is that adequate?		
Stigma faced by workers/Unwilling to go to work		
Others (example: Tips charged by operational force)		

Customer profiling, Willingness to Pay, Future Plans

12. Which segment of the citizens are mostly subscribing to mechanical emptying options?

Comparison Areas:

- Poor or Non-poor
- Slum or Non-slum

13. Which segment of the non-users have high possibility of taking up the service?

14. What do you think are the main reasons why NON-USERS are not availing mechanical service?

Cost	
Convenience of alternatives such as manual cleaning	
Timeliness of delivery	
Lack of awareness of mechanical emptying	
Lack of concern for environment and surrounding	
Complexity of Application Procedure	
Payment mechanism	

15. Do you think the present tariff structure for mechanical emptying is justified? Is there a need to change/amend the tariff/cost structure?

16. If No to previous question, what could be the justified price of mechanical emptying service in your area so that more HHs can avail it?

17. What is actual cost of providing mechanical service? How much subsidy is added in each service provision (if any)?

18. (If subsidy is added) For how long can you continue providing this subsidy?

19. Will you be providing this service with the same price offerings next few years? (probable price after 6 months, 1 year or 2 years; subsidy structure in the future)

20. (For Government Providers) Do you have any plans for outsourcing the service to private entities/ NGO? If Yes, then who do you see as visible options (collect some names if possible or type of provider)

21. Do you have any plans to integrate manual/informal sweepers to work as drivers/cleaners for Mechanical Emptying service? Why or Why Not? (Probe: Lack of skills, Stigma, etc.)

22. If Yes, then how do you plan to integrate them? (Selection, Training, Stigma related to it)

23. What could be done to improve/influence WILLINGNESS TO PAY of HHs to avail Mechanical Emptying service?

Activities	Comments	Who would be responsible?
Promotional activities to highlight the benefits and efficiency of Vacutugs		
Increased subsidy (if applicable)		
Increase awareness about cleanliness, protection of environment, health and safety		
Others (mention)		

Perspectives/Opinions of users on mechanical FSM service to be shared and their opinions: taken

- Whether service provision in 24 hours is possible
- Whether cash payment/ other payment modalities are feasible
- Whether night-time service can be provided
- Whether total solution can be provided
- Can the service charge and facilities be customized according to customer demand? Describe in details

Checklist for Non-users

1. Screening Question

1.1 Are you the owner of the house/establishment? If NO, then discontinue the interview.

2. Respondent Information

Name	
Gender	
Age	
Location	Khulna ☐ Jhenaidah ☐ Kushtia ☐
Address	
Tenancy Status	Owner ☐ Tenant ☐ Others ☐ (mention)
Household Size	
Education level	Elementary school ..... 1 Secondary school ..... 2 High school..... 3 University..... 4 No education/School dropout 5
Contact No	

3. General Information about sanitation behaviour & emptying service

3.1 What kind of toilet facilities and faecal storage system you have installed?
3.2 When was it last installed? How much did it cost?
3.3 What kind of regular maintenance do you conduct for your toilet system? (If any)
3.4 When do you think you might need to replace your existing system?
3.5 How much would you be willing to pay for installing pit/septic tank based system, when you upgrade/reinstall your toilet?
3.6 Do you use sharing toilets (with other HHs) or family toilets? If sharing, how many households and persons share the toilet?

3.7 What do you know about vacutug/mechanical FSM service? Let us know.

Probing Points

a. Service provider (who are they)
b. Functionality/Use (which services it can provide)
c. Service delivery time/Time-lag
d. Service price
e. Service benefits/Good aspects

Note: After taking their comments, show them the leaflet.

3.8 How did you get to know about this service or different features of this service (service provider; functionality; service time; price and benefits)? From whom? (Probe: CC, Pouroshova, NGO, Neighbour etc.)

3.9 When was the last time you used mechanical emptying service (in years) and which season/month?

3.10 Usual emptying practice: Periodic? Or when pit/tank is filled-up?
If periodic, mention emptying frequency (half yearly, yearly, etc.)

3.11 When do you usually prefer the removal of sludge? Day or night?

4. Accessibility & Availability

4.1 From whom did you avail mechanical emptying service?

4.2 What is the process of applying and availing this service? What do you know?

4.3 How do you evaluate the process of application?

4.4 What was the lag time between request to avail the service and service being delivered?

4.5 Would you rely on manual emptying service in an emergency situation? (Sudden outflow and it has to be dealt with within 8-24 hours)

4.6 How quickly do you think you'll get the service after asking for it now?

5. Service Product Attributes and service delivery of mechanical emptying

5.1 Please rank the following attributes in order of preference (1 to be considered most important). Please collect qualitative information about top 3 rankings.

	Aspect	Rank
1	Quick (in case of emergency) & timely (when customer wants) delivery of service	
2	Cost	
3	Ease of availing the service	
4	Clean, safe and proper removal of sludge	
5	Payment mechanism	
6	Low visibility, smell	

5.2 How do you evaluate the service delivery of manual emptying service?

5.3 Did you face any problems/bottlenecks while receiving the service? Probe areas: Narrow road, Tips, Bad smell, Neighbour complains etc.

5.4 Do you intend to employ manual emptying service again in the future? If No, then state the reasons.

6. Social Norms, beliefs & attitudes related to emptying service

6.1 Do members of your society employ emptying services proactively or only when faced with an overflow/emergency situation? What method do households in your area use? (Accepted practice in society) regarding faecal sludge management/emptying?

6.2 How do you view manual emptying service?

6.3 Why have you not opted for mechanical cleaning during your last requirement? Probe: Lack of knowledge, Cost too high, Complicated to avail etc)

Would you be interested to employ mechanical emptying service the next time you go for emptying your faecal sludge? If Yes, then Why would you choose the mechanical emptying system over manual. Probe points: Prestige Issue, Family health concern, Preventing pollution, Peer pressure, Cost etc.

6.4 What are the reasons for which you might not adopt mechanical emptying?
Probe points: Lack of knowledge, Cost consideration, Inflexible to change etc.

6.5 Does society/community in which you live encourage mechanical emptying?

6.6 Would you face any social stigma to bring a truck for emptying and making it public or will you feel any discomfort to empty in front of neighbours in broad daylight?

6.7 Would you be more likely to opt for mechanical service, if it was subsidised?

7. Pricing/Tariff Structure & Willingness to Pay

7.1 How much did you pay for manual cleaning service the last time you used it?

Take cost breakdown in the table below:

Cost Particulars	Cost	Remarks/notes
Down payment/Fixed cost/Package price		
Variable cost (if applicable)		
Other misc. cost (if any)		
• Materials (Kerosene, Spade etc)		
• Tips		
• Others (mention)		
Total Cost		

7.2 Would you be willing to pay more in an emergency situation, i.e. to receive express service or to receive service on a holiday? How much more are you willing to pay in emergency (in %)? if Yes to previous questions- How much more are you willing to pay in emergency (in %)?

7.3 Did you pay the full amount or was it shared? If shared, who shared the cost?

7.4 What was the payment mechanism? (One shot or Installment)

7.5 What was the payment method? (Cash, PO, Mobile Money etc.)

7.6 What is your perception about the payment method? (Account for both positive and negative comments and suggestions)

7.7 What is your perception about the cost/tariff structure with relevance to the service received?

Reasons

7.8 How much would you be willing to pay for the service received from manual emptier?

Optimum Price	
Price in Range	

7.9 Are you willing to pay regular fees/taxes to the concerned govt. body to take care of faecal sludge management? If Yes, then in which modality/subscription would you be willing to pay (monthly or yearly or other). How much would you be willing to pay?

8. Different Service Options and Willingness to Pay for Mechanical Emptying

PART- A: Willingness to Pay for Optimum Service Modalities

8.1 Service time-lag that you would accept/prefer (give tick)

12 Hours	1
24 Hours	2
36 Hours	3
48 Hours	4
72 Hours	5

8.2 Preferred time of service

Day	1
Night	2
Indifferent	3

8.3 Communication method to avail service

Physically go to the head office and apply	1
Apply through phone/Mobile	2
Service booths outside of head office/Sub-centres	3

8.4 Preferred mode of payment

One shot	1
Installment	2
Others (mention)	3

8.5 Preferred payment method

Cash	1
Bank draft/Cheque	2
Mobile banking	3
Others (mention)	4

8.6 Other benefits

Complete solution and HH not having to get involved at all in the cleaning process	1
Near to complete solution and HH having to get involved a little bit	2
Incomplete solution and HH involvement in cleaning process moderate to high	3

8.7 WHAT WOULD YOU BE WILLING TO PAY (In range) FOR THE SERVICE COMBINATION?

Optimum price	
Price in range	

PART- B: Willingness to Pay for Different Service Modalities (Changing One Variable, Keeping Others Constant)

*Note: Please tick the answer which is **opposite/unfavorable** to the previous answer given by the respondent*

8.8 Will you be willing to pay if? (If Yes, then ask the amount)

Particulars	Options	Yes	No	Amount
Service time-Lag	72 hours or more			Convenient, Range-optimum
Time of availing Service	• Day • Night			
Communication method to avail service	• Physically go to the head office and apply • Apply through phone/Mobile • Service booths outside of head office/Sub-centres			
Payment method	• One shot • Installment			

PART- C: Customer Willingness to Pay on ACTUAL service provision (Municipality) (will add other service providers later)

Service time-lag	72-96 hours
Time of service availability	Day
Communication method	Customer has to go to office and apply through filling forms
Payment method	Full amount through Pay order/bank draft in advance

In view of the above

WILL YOU BE WILLING TO AVAIL THE SERVICE?

Yes	1
No	2

If Yes, then how much would you be willing to pay?

Checklist for Users

1. Screening Question

1.1 Have you used mechanical emptying service/vacutug service before?

Response	Action to be taken
Yes	Continue the interview
No	Do not continue the interview

1.2 Are you the owner of the House/Establishment?

Response	Action to be taken
Yes	Continue the interview
No	Do not continue the interview

2. Respondent Information

Name	
Gender	
Age	
Location	Khulna ☐ Jhenaidah ☐ Kushtia ☐
Address	
Tenancy Status	Owner ☐ Tenant ☐ Others ☐ (mention)
Household Size	
Education level	Elementary school ..... 1 Secondary school ..... 2 High school..... 3 University..... 4 No education/School dropout 5
Contact No	

3. General Information about sanitation behaviour & emptying service

3.1 What kind of toilet facilities and faecal storage system have you installed?

3.2 When it was last installed? How much did it cost?

3.3 What kind of regular maintenance do you conduct for your toilet system? (If any)

3.4 When do you think you might need to replace your existing system?

3.5 How much would you be willing to pay for installing pit/septic tank based system, when you upgrade/reinstall your toilet?

3.6 Do you use shared toilets (with other HHs) or family toilets? If shared, how many households and persons share the toilet?

3.7 How did you get to know about this service or different features of this service (service provider; functionality; service time; price and benefits)? From whom? (Probe: CC, Pouroshova, NGO, Neighbour etc.)

3.8 When was the last time you used mechanical emptying service (in years) and which season/ month?

3.9 Usual emptying practice: Periodic? Or when pit/tank is filled-up?
If periodic, mention emptying frequency (Half yearly, Yearly, etc.)

3.10 When do you usually prefer the removal of sludge? Day or night?

4. Accessibility & Availability

4.1 From whom did you avail mechanical emptying service?
4.2 What is the process of applying and availing this service? What do you know?
4.3 How do you evaluate the process of application?
4.4 What was the lag time between request to avail the service and service being delivered?
4.5 Would you rely on mechanical emptying service in an emergency situation? (Sudden outflow and it has to be dealt within 8-24 hours)
4.6 How quickly do you think you'll get the service after asking for it now?

5. Service Product attributes and service delivery of mechanical emptying

5.1 Please rank the following attributes in order of preference (1 to be considered most important). Please collect qualitative information about top 3 ranking.

	Aspect	Rank
1	Quick (in case of emergency) & timely (when customer wants) delivery of service	
2	Cost	
3	Ease of availing the service	
4	Clean, safe and proper removal of sludge	
5	Payment mechanism	
6	Low visibility, smell	

5.2 How do you evaluate the service delivery of mechanical emptying service?
5.3 Did you face any problems/bottlenecks while receiving the service?

Give reason (Narrow road, Tips, etc.)
Do you intend to employ mechanical emptying service again in the future? **If No**, then state the reasons

6. Social norms, beliefs & attitudes related to emptying service

6.1 Have you ever used manual emptying service such as through sweepers?
6.2 How do you view manual emptying service?

6.3 Why did you choose the mechanical emptying system over manual emptying system (tick where appropriate - multiple options possible)?
Probe points: Prestige issue, Family health concern, Preventing pollution, Peer pressure, Cost etc.

6.4 What method do households in your area use? (Accepted practice in society) regarding faecal sludge management/emptying?

6.5 Do members of your society employ emptying services proactively or only when faced with an overflow/emergency situation? Does society/ community in which you live encourage mechanical emptying?

6.6 Is there any form of social stigma to bring a truck for emptying and making it public or did you feel any discomfort to empty in front of neighbours?

7. Pricing/Tariff Structure & Willingness to Pay

7.1 How much did it cost to avail mechanical/vacutug based FSM service when you used it for the last time?

7.2 Was the price same as they advertised or the price you knew before availing the service?

7.3 What is the detailed cost break down? (See next page)

Cost Particulars	Cost	Remarks/notes
Down payment/Fixed cost/Package price		
Variable cost (if any) dependent on suction capacity, amount etc.		
Other misc. cost (if any)		
• Materials (Kerosene, Spade etc.)		
• Tips		
• Others (mention)		
Total Cost		

7.4 Do you have any idea whether the price you paid was subsidised or not by the service provider?If Yes, then please mention how much was subsidised or the extent of subsidy (if possible).

7.5 Would you be willing to pay more in an emergency situation, i.e. to receive express service or to receive service on a holiday? How much more are you willing to pay in emergency (in %)?

7.6 Did you pay the full amount or was it shared? If shared, who shared the cost?

7.7 What was the payment mechanism? (One shot or Installment)

7.8 What was the payment method? (Cash, PO, Mobile Money etc.)
7.9 What is your perception about the payment method? (Account for both positive and negative comments and suggestions)
7.10 What is your perception about the cost/tariff structure with relevance to the service received?
7.11 To what extent do you think these services should be subsidised?
7.12 Are you willing to pay regular fees/taxes to the concerned govt. body to take care of faecal sludge management?
7.13 If Yes, then in which modality/subscription would you be willing to pay (monthly, yearly etc.)?
7.14 How much would you be willing to pay in BDT?

Note: show them the Leaflet before starting next section.

8. Different Service Options and Willingness to Pay

PART- A

8.1 Service time-lag that you would accept/prefer (give tick)

12 Hours	1
24 Hours	2
36 Hours	3
48 Hours	4
72 Hours	5

8.2 Preferred time of service

Day	1
Night	2
Indifferent	3

8.3 Communication method to avail service

Physically go to the head office and apply	1
Apply through phone/Mobile	2
Service booths outside of head office/sub centres	3

8.4 Preferred mode of payment

One shot	1
Installment	2
Others (mention)	3

8.5 Preferred payment method

Cash	1
Bank draft/Cheque	2
Mobile banking	3
Others (mention)	4

8.6 Other benefits

Complete solution and HH not having to get involved at all in the cleaning process	1
Near to complete solution and HH having to get involved a little bit	2
Incomplete solution and HH involvement in cleaning process moderate to high	3

8.7 WHAT WOULD YOU BE WILLING TO PAY FOR THE SERVICE COMBINATION?

Optimum price	
Price in range	

PART- B

Willingness to Pay for different service modalities (changing one variable, keeping others constant)

*Note: Please tick the answer which is **opposite/unfavourable** to the previous answer given by the respondent*

8.8 Will you be willing to pay if……? (If Yes, then ask the amount)

Particulars	Options	Yes	No	Amount
Service time-lag	72 hours or more			Optimum- Range
Time of availing Service	• Day • Night			Optimum- Range
Communication method to avail service	• Physically go to the head office and apply • Apply through phone/Mobile • Service booths outside of head office/Sub-centres			Optimum- Range
Payment method	• One shot • Installment			Optimum- Range

PART- C

Customer Willingness to Pay on ACTUAL Service Provision

Actual service provision from Municipal Corporation:

Service time-lag	72-96 hours
Time of service availability	Day
Communication method	Customer has to go to office and apply through filling forms
Payment method	Full amount through Pay order/Bank draft in advance

In view of the above

WILL YOU BE WILLING TO AVAIL THE SERVICE?

Yes	1
No	2

If Yes, then how much would you be willing to Pay?

Optimum Price	
Price in Range	

SNV

Demonstration of Pro-poor Market-based Solutions for Faecal Sludge Management in Urban Centres of Southern Bangladesh

SNV Netherlands Development Organisation
Rajeev Munankami, Team Leader
Programme Office
2nd Floor, House 345-46
Road 2, 2nd phase
Sonadanga R/A Khulna
Tel: +88 041 730 789
Email:rmunankami@snv.org
www.snv.org