REPORT (USHHD)

URBAN SANITATION AND HYGIENE PROGRAMME

Understanding the feasibility for FSM PPP contracts and reviewing existing PPP/SLA contracts

SNV

IIFC

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Abbreviations

CDC	Community Development Committee
ERAS	Environmental Resource Advancement Services
FS	Faecal Sludge
FSCR	Faecal Sludge Collection Ratio
FSM	Faecal Sludge Management
FSTP	Faecal Sludge Treatment Plant
GoB	Government of Bangladesh
IIFC	Infrastructure Investment Facilitation Company
IRF	Institutional Regulatory Framework
KCC	Khulna City Corporation
KPIs	Key Performance Indicators
LGIs	Local Government Institutions
OSS	On-site Sanitation
PPP	Public-Private Partnership
PPT	Professional Protection Tools
RFP	Request for Proposal
SLA	Service Level Agreement
USHHD	Urban Sanitation and Hygiene for Health and Development
VTs	Vaccutugs

Preface

PPP in the FSM sector is a relatively new phenomenon in Bangladesh and perhaps in other parts of the world as well. As a result, its important concepts such as the role of the government agencies, business risks allocation, performance targets, etc. will evolve over time as the sector matures. This relatively short study has attempted to look forward into the future of the industry and made some propositions with respect to the commercial and technical nature of the PPP business in the FSM sector. However, much more discussions need to take place with technical experts in the area, potential investors, government institutions and the lending institutions.

The proposed nature of target collection ratio (FSCR), solids KPI (SKPI), liquids KPI (LKPI), risk analysis, allocation and mitigation, capital provided by LGI are all concepts that will evolve over time.

Thus, the purpose of this report on understanding the feasibility for FSM in PPP contracts is to provide a likely direction that PPP may take in the FSM sector rather than a prescriptive answer for any particular LGI or situation in FSM.

Executive Summary

With the successful reduction of open defecation, a vast number of people in Bangladesh now requires regular on-site sanitation desludging. If the Faecal Sludge (FS) produced in these on-site sanitation (OSS) systems are not properly treated, then this sludge can create significant health and environmental hazards. The collection, disposal and treatment of FS need to be improved to avoid negative implications on the environment and health. Currently, different international NGOs are collaborating with the public sector to address the Faecal Sludge Management (FSM) challenges through Public-Private Partnership (PPP).

Part A of the report deals with PPP in the FSM sector. A fundamental concept while introducing PPP in a new sector, such as the FSM sector, is sector unbundling. Unbundling involves examining the characteristics of each of the subsectors and then determining how PPP may be introduced in one or more of the subsectors, how the subsectors may be reorganised and which of the subsectors (if any) need to remain within the government. According to Institutional Regulatory Framework (IRF), the critical components of the FSM sector include user interference, containment, emptying, transport, treatment, and reuse.

Vacutugs that collect and transport FS from onsite septic tanks and pit latrines perform a valuable service for residents and neighbourhoods. It is essential to incentivise emptying and transportation businesses to deliver FS to the treatment plant. For attracting private sector partner, LGIs need to provide different project support, including providing land, creating market awareness and undertaking the PPP project development. As most of the LGIs have very poor FS collection performance, it is imperative to increase the Faecal Sludge Collection Ratio through contractual terms and conditions. For decreasing the risk of termination/expiry/ short contract period for the private sector, it is essential to de-risk the purchase of VTs by setting up an agreed price for the VT fleet.

For Khulna City Corporation's proposed PPP project, it is very important to conduct the bid process following Bangladesh's Procurement Guidelines for PPP Projects 2018 and PPP Law 2015. Khulna City Corporation (KCC) should be solely responsible for removing the treated sludge as the private partner do not have any ownership in the treated sludge. Besides, for reducing the operation and maintenance cost, scheduled maintenance can be considered for KCC.

In part B of the report, the consultants review the existing PPP/SLA contracts and provide several recommendations for improving the existing contract. For the Khulna FSM project, the consultant recommends proper marketing of PPP projects to potential investors. In addition, the consultant proposes the inclusion of a PPP contract in the RFP, following the directive provided in PPP Guideline 2018. Article 26.1 of the PPP Guideline 2018 stipulate that the draft PPP Contract shall be included as part of the IFB. This is to ensure that the Bidders become familiar with the terms and conditions of the Project.

For Jashore FSM/SWM project, the current contract provides some general guideline regarding the role of the concessionaire. However, it is essential to give a detailed description of the role of the concessionaire. For instance, it is essential to define the KPIs applicable for the concessionaire and relevant penalty mechanism for any non-compliance of KPIs. The current contract has not specified the Change in law clause, and it is essential to include this clause.

For Kushtia, the Change of scope clause is missing. Ideally, the section defining the necessity of changes, admissible changes the defined procedure for making such changes need to be incorporated. Besides, Force majeure section is also missing in the Kushtia contract, and it is important to incorporate force majeure events (political and non-political), the obligation of parties, allocation of costs, compensation to the concessionaire, termination of contract due to force majeure, payments due to force majeure termination in the agreement.

For Jhenaidah, the current contract KPIs related to maintenance has not been specified. It is essential to provide a detailed description of the maintenance KPIs. Besides, the current contract

has not specified the Change in law clause. In a PPP contract, it is recommended to define the Change in law

For Faridpur, the current contract has not specified the change of scope clause. Ideally, in a PPP contract, it is recommended to define the possible modifications of scope.

LGI officials need to be trained on PPP in the FSM sector. Such training should focus on two key areas (a) PPP generic processes, and (b) major concepts for PPP in the FSM sector. While the former is the same for all sectors and is hence fairly well understood, the latter is very much new and many of the major concepts for PPP in the FSM sector will evolve over time.

Part A: Understanding the Feasibility for FSM PPP projects

1 Introduction

On-site sanitation systems, such as septic tanks and pit latrines, are a major pillar for providing access to toilets in rural and urban areas of Bangladesh. With the successful reduction of open defecation in Bangladesh, there are vast numbers of people who now depend on on-site sanitation. These on-site sanitation systems require annual desludging and maintenance. If the Faecal Sludge (FS) produced in this on-site sanitation (OSS) systems are not adequately treated, then that can create significant health and environmental hazards that may undermine improvements in drinking water supply and health services. Soon, more people are expected to become urban residents in Bangladesh, creating more pressure for On-site sanitation related services.

The sanitation problem in Bangladesh will be amplified over the next two decades if current trends continue. Access to improved facilities will likely increase, but the collection, disposal and treatment of FS from these facilities will need to be strengthened rapidly and at scale to avoid negative implications on the environment and health. There is, therefore, a need to properly conduct Faecal Sludge Management (FSM). In Bangladesh, FSM has so far been neglected with very few Local Government Institutions (LGIs) widely adopting the FSM concept. Ideally, FSM should be an integral part of Bangladesh's sanitation service provision. This is especially true in small cities which lag behind the average urban benchmark.

Despite significant progress under the Millennium Development Goals (MDGs) to increase access to improved sanitation; investments in the subsequent steps, such as the safe emptying, transportation and treatment of FS from OSS systems, remain a significant challenge for Bangladesh. Bangladesh is gearing up to address this post- 'open defecation free', or ODF, challenge otherwise known as the second-generation sanitation challenge. Different international NGOs, including SNV, are collaborating with the public sector to address the second-generation sanitation challenge through Public-Private Partnership (PPP).

This report aims to assist SNV in this process by providing an understanding regarding the feasibility of PPP project development process and transaction. Part A of this report reviews the current experience of the FSM PPP projects in Bangladesh and reviews the current FSM industry subsectors and its ability to be converted towards PPP. In addition, Part A of this report provides a guideline for implementing PPP projects in FSM, followed by a financial analysis of an FSM project. As one of the objectives of this report is to assist SNV in implementing the FSM PPP project, a base financial model has been constructed using the data from Khulna City Corporation (KCC). Finally, Part A of this report provides some general recommendations based on the overall study findings. Part B of this report reviews existing PPP contracts in the FSM sector and provides comments for the scope for improvement in four FSM PPP contracts and one bid process. Part B of this report provides specific Heads of Terms of a PPP contract, which can be used by different LGIs to improve their respective PPP contracts.

2 Market Analysis for SNV's FSM Projects

This chapter discusses the municipalities where SNV is currently operating and the existing FSM market situation in those municipalities. Currently, SNV is collaborating with several Local Government Institutions (LGI) for improvement of FSM services. This chapter provides an overview of these LGIs.

2.1 Overview of Municipalities Supported by SNV

2.1.1 Khulna

Khulna, the third-largest city in Bangladesh with an estimated population of 1.5 million hosts traditional industries (e.g. jute processing). The city's population is growing while Khulna remains the regional administrative centre and is adjacent to the second seaport in Bangladesh, Mongla. The city has no existing sewerage network and the population depends overwhelmingly on manual emptying services for sludge management, which is inadequate, unhealthy and also damaging to the environment. KCC and the Community Development Committee (CDC) are providing mechanical emptying services to the city dwellers with different tariff. There is no fixed rate for manual emptying as it depends on the negotiation with the emptiers and customers.

In Khulna, three types of emptying services being practised. First, KCC provides services through 4 Vacu-Tug (VT). Second, the CDC provides service through 3 VTs. In addition, manual emptiers, who belong to the harijan community, provide emptying service.

Khulna City Corporation-run Mechanical Emptying Service: KCC provides mechanical emptying service to the citizens through 4 VTs. Any citizen can take this service by filling up a form to provide information about the pit/septic tank size, road size in front of the house, machine to pit/septic tank distance. Along with submission of the form, applicants have to submit pay-order issued from a local bank in favour of KCC. Then, a supervisor from the Conservancy Department of KCC visits the home to validate all the information of the application form within 24 hours. If the supervisor gives the go-ahead, the VT operator reaches the client's home within 48 hours. After that, sludge is mechanically pulled out from the OSS storage, and then it is transported to the treatment plant located at Rajband. The capacities of the KCC VTs are 7,000 and 5,000 litres. Presently the VT with 5,000-litre capacity is non-functional.

CDC Operated emptying service: CDC provides mechanical emptying service through 3 VTs, each having1,000-liter capacity. However, currently no CDC VT is functional. In case of availing the service of CDC operated VT, the customers do not need to apply formally and can call directly to the CDC cluster leaders or VT 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 a flat tariff of BDT 1,000 for each trip for 1,000-litre capacity trucks.

Manual Emptiers Providing Emptying Service: Customers can hire informal emptiers through contacts in-person or calling them if the phone number is available. Emptiers come to customer's house within 24 hours of getting the call. They usually make their demand based on the size & location of the pit/tank, the distance between storage and dumping place. After negotiation and having confirmation from customers, they start their work.

2.1.2 Jhenaidah

Jhenaidah is a small and comparatively new town with a population does not have any sewerage network. In Jhenaidah, household sanitation is predominantly OSS technologies, with 45% of households having septic tanks and 48% households having pits, both of which require regular emptying. Although mechanical emptying is increasing, still most of the households are mainly emptying their OSS system manually by sweepers who often cannot transport emptied sludge to a safe or designated place for disposal. Since last December 2017, Jhenaidah Paurashava outsourced their emptying, transportation and treatment of FS to a local NGO called AID Foundation. AID Foundation is following the same tariff structure which Paurashava fixed

previously. Recently Paurashava also introduced a sanitation tax to their city dwellers and is charging both tax and tariff for FSM services.

2.1.3 Kushtia

Kushtia is one of the oldest municipalities in Bangladesh that is currently serving as a trading and manufacturing hub. The city has a current estimated population of 0.38 million. Though the municipality provides mechanised emptying services, still illegal dumping exists in the city due to improper management system. Paurashava is in the process of introducing sanitation tax.

2.1.4 Jashore

Jashore is one of the oldest municipalities in Bangladesh. The municipality was established in 1864. The municipality used to provide mechanical emptying services through the VTs provided by development partners which are non-functional in recent days. Therefore, currently, all the emptying is done by informal manual emptiers. There is no fixed rate, but the fee depends upon the negotiation between the emptiers and the house owners, which is between BDT 3,000-5,000 depending upon the size of the containment. There are a couple of settlements where emptiers are living, and these emptiers are providing emptying services to the entire city dwellers.

2.1.5 Benapole

Benapole with population 36,524 is one of the newest municipalities of Bangladesh. The municipality was established in 2006. Benapole Paurashava is located in Sharsha Upzilla in Jashore District. Even though the Municipality is responsible for the provision of sanitation services including emptying but due to lack of awareness and resources, they haven't provided any services till now. Therefore, all the emptying are done by informal emptiers who come from adjoining areas as there are no known settlements for emptiers. The cost they are charging is solely dependent upon the negotiation with the house owners. In all the municipalities including Benapole, along with mechanical emptying manual emptying is prevalent. Ideally, it is important to gradually reduce the manual emptying process. The following section provides a comparison between manual emptying and mechanical emptying procedure.

2.2 Comparison between Manual Emptying and Mechanical Emptying Procedure

During the stakeholder consultation, it was found that many households use non-mechanised means to remove sludge from the containment units. Non-mechanised means included manually lifting the sludge using a bucket or shovel. In the case of manual emptying, there is hardly any capital costs involved unless investments are made in mechanical handheld equipment, such as gulper pumps. Typical tools used in manual emptying include buckets, ropes and shovels. A few manual emptying businesses rent these tools, and the primary cost incurred is mostly labour costs.

In Bangladesh, providing manually emptying service is a common practice among several social groups, who carried this as an alternate occupation. The sludge removed through these non-mechanised means was often disposed of in nearby surroundings or stormwater drains. The most common reasons for pursuing such non-mechanised desludging include:

a. Non-approachability of VTs due to narrow approach roads.
b. Delayed response by the government vacuum trucks
c. Lack of knowledge on such a facility by the municipality

Sludge is disposed of manually by burying it in a nearby land, dumping it in open fields or in open drains. In some instances, the disposal of sludge involves travelling to a site located a significant distance away. In such cases, cheap transport methods, such as pushcarts, cycle carts or bullock carts, three-wheelers, modified bikes attached to carts or container trailers, etc., are used. Currently, most of the people involved in manual emptying do not use protective gear such as hand gloves or bodysuits, and are thus in direct contact with the faeces, which could cause skin rashes and other related health issues due to direct exposure to pathogens. Considering the health hazard of manual emptying process, currently, most of the LGIs are promoting mechanical emptying service.

For a business using mechanical trucks for emptying sludge, the key capital cost is the truck itself. The truck price often varies depending on the use of second-hand trucks, local assembling of trucks and import taxes. In Bangladesh, trucks are often locally assembled, where a second-hand vehicle is modified to include vacuum pumps, hoses and containers. The operational costs of a business using mechanical trucks include labour (two to three people per truck, including a driver), fuel, and periodic repair and maintenance of the truck. Minor costs incurred mostly include telephone expenses and advertisement costs (printing leaflets).

The entire operation of mechanical desludging can last for about 10-15 minutes, depending upon the accessibility and thickness of the sludge to be pumped out. After opening the access, a crow bar or a stick is inserted into the pit/tank to get an understanding of the thickness of the sludge. If the sludge is thick, then water is poured usually through the toilet pan and mixed with the crowbar till it can be pumped out. With vacuum suction, the operators can empty 3 – 4 m^3 of sludge in 10 minutes (this excludes the time in breaking open the access point). Solid waste such as polythene, stones are often present in the pits/tanks, which can choke or block the suction pipes. Municipal operators usually use flexible pipes for suction, made of PVC and cover a long distance. For instance, in KCC, the operators often use flexible pipes with a length of 500m.

3 Unbundling the FSM Industry Structure for the Introduction of PPP

This chapter discusses the current FSM industry structure in Bangladesh. Currently, several international NGOs including SNV, Practical Action and Water Aid are collaborating with the public sector to address the second-generation sanitation challenge in Bangladesh. In addition, government agencies are trying to introduce a relevant regulatory policy for promoting the concept of PPP in the FSM sector.

A fundamental concept for the introduction of PPP in a new sector, such as the FSM sector, is called sector unbundling. Unbundling involves examining the characteristics of each of the subsectors and then determining how PPP may be introduced in one or more of the subsectors, how the subsectors may be reorganised and which of the subsectors (if any) need to remain within the government. There also may be a case for a certain subsector to become free entry i.e. fully accessible by private sector capital and service provision. As this will involve change management, we will need to view the sector's unbundling over a time period.

In the beginning, before sectoral reforms take hold, the sector is regulated by the government through, typically, one or more legislation. The mandated government entity is then given responsibility and authorised to invest in and provide all the public services in the sector. When the need for the public services become very high to the extent that the mandated government entity is unable to undertake the required level of investments in the sector, leading to poor public services, a government may consider the introduction of PPP in the sector to ameliorate the need for extensive government investments in the sector. At this point, it is worthwhile to recall the basic features of a PPP:

- A PPP is a business in which a private investor will invest in and operate a facility for providing public services.
- The PPP business has to be carried out through a PPP contract entered into between a government entity and the private investor for a defined period of time.
- In order to maintain transparency, the private investor is usually selected through a tendering process.
- To the extent possible, a PPP contract has to be well written, with the rights and responsibilities of the government-defined and in a similar manner, the rights and responsibilities of the private investor also defined.
- Some mechanism for tariff setting, tariff control and royalty.

Let us quickly review the sectoral reforms in the electricity sector in Bangladesh and how PPP was introduced in the sector. By analysing the sectoral reform process in the electricity sector, it will be possible to highlight the probable way forward for the FSM sector. Through discussing the lessons learned in other sectors, including energy, it will be possible to streamline the private sector engagement process in the FSM sector. Before 1996, the electricity sector was vertically integrated. Generation, transmission and distribution all belonged to the Bangladesh Power Development Board (BPDB) in a vertically integrated manner. Sectoral unbundling took place along generation, transmission and distribution subsectors. Over a period of 23 years, a large amount of investments has occurred through independent power producers (IPPs) with the result that presently, over 50% generation is from private investors, who are both national and international companies. Many of BPDB generation assets have been given to new government-owned companies such as NWPGCL, APSCL, EGCB, and RPCL. The transmission has been separated into a new government-controlled company call the Power Grid Company of Bangladesh. Distribution has become the responsibility of new government-owned companies such as DPDC, DESCO, NESCO, WZPDCL, PBSs under REB. The sectoral reforms are ongoing, with the Power Cell and Power Division providing the lead in the reform process.

The concepts behind the unbundling in the FSM sector are yet to be established in any level of detail. Having given the rationale for unbundling above, in this report, we will attempt to identify in a preliminary manner, the subsectors in the FSM sector and which of these subsectors may initially be thought of as being attractive for PPP. Contract development and investor selection

process (bidding management) will need to follow based upon risk identification and allocation, subsector identification.

The subsectors in FSM may be thought of as being unbundled into the three conceptual basis as follows:

1. Given to PPP
2. Free entry for private investors
3. Remaining within government

In actual practice, different LGIs may opt for different styles of sector unbundling and different types of PPP, and this may change over time. In this report, we will cover the basics of the sector, what the subsectors could be, based upon present regulations and some scenarios of likely PPP.

An important feature of PPP in FSM could be the level of existing capital equipment and assets to be provided by the LGI under a PPP contract. This is a vast subject and will be different in different LGIs, depending upon the VTs they own and are willing to give to the private investor, the FSTP they own and are willing to give. It is worthwhile remembering that the private investors will usually need a significantly larger number of VTs than what they will typically receive from the LGI. We have attempted to cover this area briefly, and our financial model has features to incorporate the provision of capital equipment as part of the deal written into the PPP contract.

3.1 FSM Legal Basis & Institutional Structure

According to the Local Government Act 2009, municipalities are responsible for FSM service. The City Corporation and Pourashava Acts (2009) also assign responsibility for sanitation services to local government. Recent moves to clarify responsibility for urban FSM have culminated in the development of an Institutional and Regulatory Framework for FSM. Typically, it is the responsibility of the local municipality to provide a sanitation service to its residents. However, in practice, emptying services are provided by both the public and private sectors. Private organisations closely worked with the government for promoting safe on-site sanitation FSM services. In recent days, the government is trying to further enhance this initiative by inviting private sector partners in FSM PPP projects. In fact, along with the sanitation sector, the Government is trying to promote the concept of PPP in all infrastructure sectors. In this regard, the government has created a law and several policy guidelines for implementing PPP projects.

3.2 Relevant PPP Laws and Regulation

This chapter presents an overview of existing PPP law, rules, regulations and guidelines that are relevant to the FSM Sector. Here, the overview subsumes different arenas covering PPP related aspects and technical aspects. We present the elements in the following sections. In 1996, the Government of Bangladesh adopted a private sector power generation policy to promote private sector participation. In 1997, under the administrative control of the Economic Relations Division (ERD), Infrastructure Investment Facilitation Company (IIFC) was established by the World Bank to provide advisory support for PPP projects. At the same time, Infrastructure Development Company Ltd (IDCOL) was established to promote private sector investment in infrastructure development.

In 2004, the government established the Private Sector Infrastructure Guidelines under which several PPP projects were carried out. In 2007, Investment Promotion and Financing Facility (IPFF) endowed with BDT 4.18 billion (equivalent to USD 60 million) was set up in Bangladesh Bank to finance government-approved PPP based infrastructure development projects to be implemented by the private sector. In mid-2009, policy encouraging public-private collaboration was included by the Government of Bangladesh (GoB) in the national budget legislation. The GoB prepared its first PPP budget in FY 2010 and encouraged infrastructure project implementation through PPP in the country. Under a new national policy, the PPP Office was established in September 2010 as a separate, autonomous office under the Prime Minister's Office to act as a facilitator to proactively realise PPP projects. Later the PPP Office was renamed

as the PPP Authority. For interested investors and lenders, the PPP Authority provides a centralised portal to high-quality PPP Projects.

PPP Authority plays several crucial roles in PPP project development and implementation. First, PPP Authority screen candidate projects to assure that only the most attractive, viable and sustainable opportunities are pursued. Second PPP Authority closely works together with sector line ministries and implementing agencies, augmenting their efforts with external professional resources. PPPA also shortlist PPP projects to a standard attractive for international competitive bidding and in a form that creates value for the people of Bangladesh. Third, PPP Authority oversees a robust and transparent tendering, evaluation and award process to assure an expedient and efficient pathway to a conclusion. Fourth, PPP Authority facilitates financing for PPP projects by supporting early-stage project development financing and as needed, capital support to help achieve financial close of awarded projects. Fifth, PPP Authority oversees the commercial negotiation of PPP contracts to ensure that the balance of risk-sharing between the public and private sector are in line with the overall PPP policy. Finally, PPP Authority support sector line ministries during the implementation phase of PPP projects to assure the projects remain on schedule and perform as agreed. Overall, the institutional framework around PPP development was centred on the following three institutions:

1. PPP Authority,
2. Finance Division, and
3. Planning Commission.

While these three agencies act as the central agencies driving the country's PPP vision, the other agencies of the government like National Board of Revenue (NBR), Bangladesh Bank (BB), Economic Relations Division (ERD), Department of Environment (DoE), Ministry of Land, Ministry of Law, Justice and Parliamentary Affairs and other central agencies also play very important roles in PPP project implementation. The Line Ministries and Executing Agencies are primarily responsible for initiation, development and overseeing the implementation of PPP projects. According to the Policy and Strategy for PPP, 2010, of the GoB, PPP models can be considered for any project that generates public goods and services if at least one of the following circumstances exists for the project:

a. The implementation of the project is difficult with the financial resources or expertise of the government alone;
b. Private investment would increase the quality or level of service or reduce the time to implement compared to what the government could accomplish on its own;
c. There is an opportunity for competition, where possible, among prospective private investors, which may reduce the cost of providing a public service;
d. Private investment in public service provides an opportunity for innovation; and
e. There are no regulatory or legislative restrictions on private investment in the delivery of the public service.

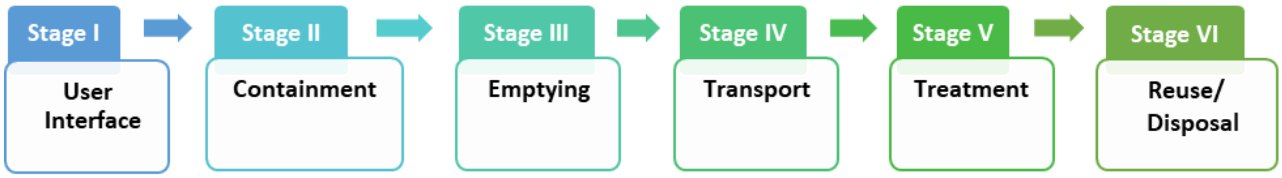
With close cooperation of PPPA, The Bangladesh Public-Private Partnership Act, 2015 ("PPP Act") was enacted and gazetted in 2015. The PPP Act is currently the guideline for implementation of projects under the PPP. The PPP Act has been enacted with the objective of facilitating the development of core sector public infrastructure and services vital for the people of Bangladesh. The law prioritizes increased investment in infrastructure which is essential for sustainable economic growth. It further provides a robust legal framework to attract the interest of national and international private sector investors to join in partnership with the government in building and upgrading core infrastructure assets. Under PPP Act, a wide range of powers have been provided to the PPP Authority to ensure an efficient and comprehensive development of the PPP program. This includes development of policy, regulations and guidelines, development of standard documentation, appointment of consultants and advisors, providing consents and opinions in relation to PPP projects, organizing seminars and training sessions, etc. Along with the PPP Act, subsequently, the government issued several guidelines and rules for PPP projects, including the Procurement Guideline for PPP Projects, 2018.

3.3 Stages in FSM Value Chain

For understanding the existing sanitation situation in LGIs, FS value chain analysis was conducted as part of this project. The FS value chain is the linear linkage of dependent

components in the pathway of FS generated from onsite sanitation system. The value chain has components such as user interface, containment, emptying and transportation, treatment and reuse. The figure shows a schematic representation of the value chain[1].

Figure 1: FSM Value Chain



According to IRF, the critical components of the FSM system include user interference, containment, emptying, transport, treatment, and reuse. The flow of funds from one step to another has to be carefully analysed to ensure the commercial sustainability of the FSM process.

As shown above, the value chain in FSM consists of the following stages:

Stage I: User Interface

Stage II: Containment

Stage III: Emptying

Stage IV: Transport

Stage V: Treatment

Stage VI: Reuse/Disposal

Stage numbers from I to VI have been given for the convenience of discussions. Out of the above six stages in the FSM Value Chain, Stage I and Stage II are a part of the house or dwelling and are not discussed further as they are less likely to become a part of PPP in the near future. The key steps of the remaining FSM value chain from Stages III to VI are discussed below:

3.3.1 Emptying and Transportation (Stage III &IV)

VT that collects and transports FS from onsite septic tanks and pit latrines performs a valuable service for residents and neighbourhoods. Without collection and transport companies to remove FS, onsite systems will not function properly. Therefore, in the PPP FSM project, the efficient operation of VT is a very crucial element.

It is essential to incentivise emptying and transportation businesses to deliver FS to the treatment plant. By formalising transactions between the emptying and treatment component of the chain, the emptying businesses can be incentivised to deliver FS to treatment plants and avoid indiscriminate disposal.

In PPP FSM project, the VT operators and assistants play a very important role. In terms of increasing the collection ratio, which is a fundamental Key Performance Indicator (KPI), the operators and their assistants can play a crucial role. The operator who comes to collect the FS is often the only person that a resident will interact with regarding their onsite system. As such, the operator has a responsibility not only to perform the tasks correctly, but to be knowledgeable about the onsite system, and to be able to communicate why sludge removal is necessary and beneficial to the client and their community.

[1]FSM Value Chain According to the Institutional and Regulatory Framework (IRF) published by Local Government Division (LGD)

Figure 2: Emptying Operation of FS from a Septic Tank Using Vacuum Equipment

The operator is also the only person who will be able to observe the onsite storage system both when it is full, and when it is empty. They should use this opportunity to assess how well it is functioning, identify repair needs and issues related to the proper operation that might increase the life span of the system. As such, they can also troubleshoot and be a source of valuable information about FSM in the community. Operators can also play an essential role in terms of building awareness for FSM among the community members. Considering the important role of operators, it is essential to train them properly. Often, due to the complexity of different types of onsite technologies, economic status and access, a VT service provider can use different types and range of VT simultaneously in any given geographical region, and within the same company. A short description of these VTs is provided below:

3.3.1.1 Conventional VT

Conventional VTs are typically fitted with either a relatively low cost, low volume sliding vane pump or a more expensive liquid ring pump. The former is more appropriate for low-capacity vacuum tankers where high vacuum and low airflow sludge removal techniques are used. Vacuum conveyance techniques work best for removing low-viscosity sludge such as that found in septic tanks. Typical duties and responsibilities of FS emptying, and transport service providers include those that occur before the FS removal, the FS collection/emptying itself, and the subsequent transportation of the FS to the treatment facility.

In Bangladesh, households are usually desludged when their pits/ tanks once are filled or when there is unpleasant odour emanating from the toilet or containment unit. In such cases, households would approach the LGIs and register a service request. Based on the availability of the vehicle, the service appointment would be provided. VT operators, usually on rolls of the LGIs, would pick the service request receipt along with the mobile number of the customer and seek clarification on the address and approach.

3.3.1.2 Pro-Poor Small VTs

In Bangladesh, often it is difficult for large VTs to access narrow roads. At times, it is not possible for the desludging operation to be carried out due to narrow roads or because the sludge was too thick to be pumped out. Considering this issue, small VTs can be used to access narrow streets in different municipalities. The volume of small VTs used for the collection of FS can range from 100 litres to 1000 litres. Various factors can influence the selection of a small vacuum truck by a service provider, including:

- the typical volume of the tanks or vaults that will be serviced;
- road widths and weight constraints;
- distance to the treatment plant;
- availability;
- budget; and
- skill level of the operators

With smaller capacity, a particular city may require several VTs, which will effectively increase the size of VT fleet and O&M cost. But, these small VTs can also provide crucial employment opportunities for several vulnerable communities, who rely on the income generated from emptying and transport service. These small VTs can be operated by different community groups, for instance, harijan community. It is difficult for the community groups to purchase bigger VTs due to their limited financing capability. These community groups traditionally provide manual emptying services in different LGIs, and it is essential to ensure employment for these groups. With Pro-poor small VTs, these communities can be involved in operating the small VTs.

3.3.1.3 Application of Transfer Station for Reducing O and M

One of the critical cost components of FSM business is the O&M cost of business. O&M costs vary significantly with the frequency of desludging and the quantity of FS transported to the Faecal Sludge Treatment Plant (FSTP) plant. Often these numbers are linked to the number of people per household, number of trips which can be made per day, and distance required to travel to dispose of the sludge. The O&M cost can be minimised by optimising transport routes through strategically located treatment plants or transfer stations.

In general, the viability of transportation services depends significantly on their ability to desludge as soon as possible after serving a household to minimise the time in traffic and accept the next job. With an efficient Emptying and Transport (E and T) and transfer station mechanism, the overall cost can be minimised, leading to better profit margin for the private sector. The transfer station can be an intermediate step in the emptying and transportation component of the sanitation service chain, prior to final disposal of septage at the treatment plant. A transfer station is appropriate in the following context:

Distance and time: Longer distances or time required to transport sludge to the treatment plant can create financial disincentives (fuel costs and time spent) for vacuum truck operators, resulting in illegal disposal

Inaccessible pits and manual emptying: On-site sanitation systems that are inaccessible to VTs are typically emptied either manually by an operator or using smaller VTs. These emptying methods have a slow-moving transport system, and in order to make profits, it is important to minimise the travel distance to disposal sites.

It is well known that an emptying business can increase its profits by increasing the number of pits/tanks emptied vis-à-vis number of trips made on a daily basis. Strategically located transfer stations reduce the transport time for emptying operators, resulting in more tanks/ pits emptied per day. There can be different types of transfer stations, including fixed transfer stations and mobile transfer stations, which are discussed below:

Fixed transfer stations: These are permanent structures which are often underground holding tanks (UHT) that are watertight with an inlet pipe for disposal of sludge, and an outlet pipe for discharging sludge into larger VTs for carting away. They may also have a solid-liquid separator connected to the sewerage system, where the liquid is discharged into the sewerage network and may result in a substantial reduction in the volumes of FS to be transported by the trucks.

Mobile transfer stations: As the name suggests, this transfer station is mobile in nature and is strategically located. It can be a large truck located temporarily at sites, where a number of operators (mechanical and manual emptying) work. It could also consist of a detachable tanker trailer that is transported when it is full and is replaced with an empty one.

In Addis Ababa, Ethiopia, the Addis Ababa Water and Sewerage Authority (AAWSA), a public utility service, built four mobile transfer stations. The sludge (from OSSs) emptied by VTs (3 m^3) is transferred into larger trucks, which then take it to the treatment plant. The transfer stations service only AAWSA operated VTs and trucks operating the farthest distance from the treatment site. It was observed that the transfer stations reduce the travel distance by 12 km per trip.

3.3.2 Treatment (Stage V)

FS can be treated in a variety of ways, and there is no single best option considering the widely varying conditions of urban areas. The criteria for shortlisting options are based on area requirement, treatment efficiency, simplicity in operation and maintenance, reliability and

robustness of treatment modules, odour and public nuisance and cost-effectiveness of the system at CAPEX and OPEX levels.

Table 1: FS Treatment Technologies Shortlisted

Sl. No.	Treatment Stages	Treatment Modules
1	Pre-Treatment	Screen and Grit Chamber
2	Solid Liquid separation	Feeding Tank Sludge Drying Beds
3	Solid Stabilisation	Biogas Digester Sludge Stabilisation Reactor Planted drying beds
4	Liquid Wastewater Treatment	Settler + Anaerobic Filter Chamber
		Vertical Planted Gravel Filter
5	Tertiary Treatment	Sand carbon filter and UV treatment

In Bangladesh, Unplanted Drying Bed and Planted Drying Bed has been mostly used for FSM projects. The table below shows comparisons between the technologies considered:

Table 2: Comparison of Unplanted Drying Bed and Planted Drying Bed Technology

Modules	Function	Operation & Maintenance	Odour	Reuse
Unplanted Drying Bed	Unplanted Drying beds are simple sealed shallow ponds filled with several drainage layers. Sludge is applied on the top and dried by percolation and evaporation	Trained staff is required for application of sludge, controlling drainage system and desludging	Very less chance of odours and flies	Dried sludge can be reused after further drying which can be done by storage or composting. FS is available for reuse in 2 weeks' time[2].
Planted Drying Bed	Planted Drying beds are sealed shallow ponds filled with several drainage layers and Plants. Sludge is applied on the top and dried by percolation and evaporation. The plants maintain the porosity of the soil and enhance the evaporation by transpiration	Trained staff is required for application of sludge, controlling drainage system, desludging, maintaining the plant growth	Odours and flies may be noticeable	Dried sludge has very minimum re-use. FS is available for reuse only after the beds are filled up in 6 to 7 years time[3].

3.3.3 Reuse/Disposal (Stage VI)

Using unplanted drying bed technology, the treated sludge can be used as fertiliser, briquettes, charcoal and other material. Market development is one of the critical aspects of any Reuse/Disposal based model. Although FS can be further processed to produce fertiliser and

[2]This technology could become a driving factor for PPP investors who are interested in making organic manure through co-composting.
[3]This technology could become a driving factor for PPP investors who are not interested in making organic manure.

briquettes, such processing should be carried out if it is commercially viable. Market promotion for this fertiliser and briquettes should be crucial, especially in regions where a supply chain for fertiliser and/or briquettes does not exist. The compost and briquettes should be marketed to the most cost-effective (i.e., bulk purchase) customer segments to reduce marketing costs. It may well be that smallholder farmers or traders (objective - poverty alleviation) might not be the ideal market segment, since the number of customer contacts will be high, and the quantity sold per client will be low.

Reuse is strongly advocated too, and due its own business potential by generating revenue from selling of the FS by-products, it is recommended to be carried out as a free entry project or a separate PPP. By doing it, the costs of operation of the FSTP can be covered by the selling and, at same time, the reuse producer self-ensures the quality of the treated sludge and its physical parameters.

It is also important to note that reuse can increase the complexity of the treatment plant, stakeholders involved and related financial risks, given that it requires broader expertise, higher investment and O&M costs. Reuse can be a consideration, only if the additional cost is less than additional revenue generation for the Stage VI. Therefore, reuse/disposal should not be central to the business model for PPP. If the market and selling price of the resource generated is not sufficient to cover at least the additional O&M costs related to reuse, then reuse can become a burden, and the business will incur financial losses. In addition, neither fertiliser production nor energy production is within the core mandate of an LGI as they belong to the agriculture ministry, industry ministry or energy ministry.

On the other hand, lumping Stage V and Stage VI together into a PPP may result in the LGI cross-subsidizing a sector that does not fall under their mandate. Such a cross-subsidy will likely have a dragging effect on the roll-out of PPP in the FSM sector. The client can implement a separate PPP project for ensuring the reuse of treated sludge. In other words, reuse has to be cost-effective on its own for it to be taken up seriously within PPP. Its benefits, costs and investor interest will indicate the path forward for this stage.

3.4 Determining the Sectoral Unbundling Process

During PPP Project structuring, LGI should determine to what extent LGI and the Private Partner shall be responsible for each FSM Value Chain's Steps: emptying, transportation, treatment and disposal or reuse of the collected sludge. The different Steps can be bundled or unbundled, depending on the purpose of the Project. Depending on the project objectives, the unbundling process can vary depending on the individual project context. The specific criteria for unbundling should be assessed during the feasibility study phase based on an extensive market survey. For instance, based on the feasibility study if it is evident that the government is best able to manage the Stage I (User Interface) and Stage II (Containment), then the public sector needs to take responsibility for these two stages.

From individual feasibility study, if it appears that the private sector is best able to manage stage III to V, then the PPP project should be structured with KPIs targeting these four stages. For instance, in the Khulna FSM project, the private partner is responsible for Stage III to V. On the other hand, in Kushtia's currently FSM project, the private investor is only involved in Stage V and VI. In other stages for Kushtia, the government is playing the leading role. In Jhenaidah, the private partner is involved from Stage III to V.

3.5 Need to Attract Good Investors in FSM PPP Project

In the PPP project, it is essential to attract good quality investors through a carefully planned project development and transaction process. For attracting good investors, it is necessary to prepare the project in a bankable manner. Projects developed using the PPP approach are well known for the high leverage ranging from 50% to 90%, relying extensively on the debt capital provided by the debt holders such as banks and other financial institutions. Therefore, raising sufficient funds via the debt channel is a key task for PPP sponsors and project companies

As PPP projects rely on banks, the project needs to fulfil the standard terms and conditions of a commercial bank. Usually, banks review the PPP contract and provide debt-based on contractual

terms and conditions. For instance, clearly defined contractual terms for force majeure and dispute resolution procedure are very important from the bank's perspective. Debt finance providers need to know the bankability-related issues of PPP projects to make the appropriate arrangement of debt financing and avoid funding problems. For the FSM business, there can be two types of investors with two different investment objectives.

First, there can be some investors who are already involved in the organic fertiliser business. Ideally, these investors will be more interested in the reuse part of the FSM value chain. For these investors, unplanted drying bed technology can be the ideal technology. If LGIs wants to focus on the reuse part, then ideally, first appropriate technology should be selected, and then the project should be packaged in such a manner that it's financially feasible for an entrepreneur with organic fertiliser business. From the government's perspective, the bidding parameter for these investors can include the per-unit price for the treated FS.

Second, there can also be some investors who do not have any existing organic fertiliser business. Instead, these investors are only interested in the operating and maintenance part of FSTP. For these investors, planted wetland technology can be the ideal technology, as this technology involves minimum O&M cost. If LGIs want to focus only on the emptying, transportation and treatment part, the project should be packaged in such a manner that the emptying and transportation fee can alone make the project financially feasible.

4 PPP Options Analysis

A FSM PPP project can be implemented under different options and the contract needs to be structured accordingly. It should be noted that the quality of the contract would play an important part in determining the benefits of all PPP options. Good quality contracts will, amongst other things, encompass an appropriate allocation of risks. Therefore, it's important to carefully prepare the FSM PPP contract, which is a key objective of this project. Further, except for service contracts, a transparent and well-considered regulatory framework is important in securing the benefits of PPP. The following subsections present a summary of the key PPP options:

4.1 Service contracts

Service contracts include technical assistance contracts, plus subcontracting or contracting out specific aspects of the FSM service. For instance, these contracts can involve a contracting with a private partner for the collection of FS. In its simplest form, the private partner provides agreed services to the public authority under the public authority's general control and supervision.

4.2 Management Contracts

A management contract is a more comprehensive form of the service contract, under which the public authority can appoint a private partner to manage all or part of the operations. Under such contracts, the bulk of the commercial risk and all the capital and investment risks remain with the government. Responsibility for all investment remains with the government under a management contract. These contracts are useful if the core objective is to increase the technical efficiency of the service.

4.3 Lease Contracts

Under a lease contract, the government leases the full operation and maintenance of its facilities within an agreed geographic area to a private partner for a period of time, say, ten years. The contract grants the private partner the right to invoice and collect charges from customers within that area. The government would own the assets and remain responsible for major extensions and upgrades. The private partner would be consulted on all major works, especially when the continuity of service is involved, and may participate in the tender evaluation or submit its own tender.

4.4 BOT Type Contracts

Build-Operate-Transfer (BOT), Build-Own-Operate-Transfer (BOOT) and Rehabilitate-Operate-Transfer (ROT) schemes are a variety of adaptations of leasing contracts specifically designed for greenfield projects or investments in PPP which require extensive rehabilitation. The nature of these contracts makes them particularly amenable to new sources of bulk supply. Under these arrangements, the private partner typically designs, constructs and operates facilities, and provides services to the municipality. Generally, any existing underlying assets are leased for a limited period, often 15 to 30 years. Contracts should be designed to allocate risks between the private partner and the government, preferably according to the capacity to manage and minimise risk.

In contrast with lease contracts, BOT type contracts allocate much more of the commercial risk for specific projects to private parties rather than governments. They can also provide a relatively quick method for mobilising project-based non-recourse finance for new capital investment in a PPP project.

4.5 Concession Contracts

Concession contracts combine elements of operating leases for existing assets and BOT contracts for green fields. Under concession contracts, a private partner is given a contractual right to use existing infrastructure assets. However, the concession contract also includes obligations to finance extensions and upgrades to the existing infrastructure. This tends to result in concession contracts being of longer duration than lease contracts to enable the operator to recover its

capital and financing costs. Management of all capital extensions and upgrades, as well as normal maintenance, is often entirely the responsibility of the private partner.

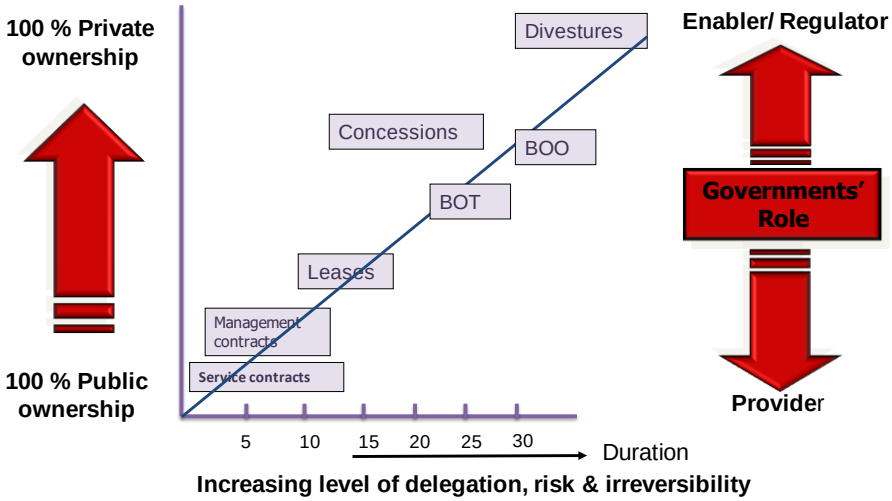
4.6 Divestiture and Build Own Operate

PPP in infrastructure can also be achieved through the direct sale of infrastructure assets to the private partner. Private ownership of assets may be achieved through either 100 per cent private ownership or JV with public sector corporations. In either case, the government retains the regulatory role.

Divestiture can be by way of sale of PPP assets, sale of shares or management buy-out. Like divestiture, BOO contracts require removal of constraints to private partner entry in PPP infrastructure and the introduction of competitive market structures or regulation by government. In a full divestiture or BOO arrangement, the private partner has full responsibility for operations, maintenance, and investment in a project.

PPP is a partnership contract between the public sector and the private sector. The partnership arrangement varies, as mentioned above, based on the project-specific issues. The partnership patterns of this agreement change with the ownership model of the project. We describe this form of partnership by the following figure:

Figure 3: Forms of PPP Partnerships



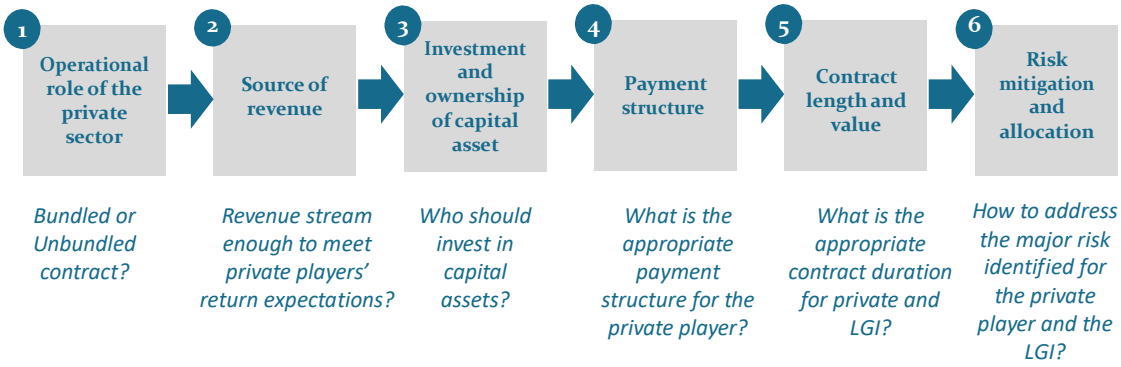
Based on the asset ownership, investment, commercial risk and duration, the above-mentioned forms of partnership can be presented in a matrix, which depicts private or public nature of the business:

Figure 4: Range of PPP Options

Option	Asset Ownership	O&M	Investment	Commercial Risk	Duration (years)
Service Contract	Public	Both	Public	Public	1-2
Management Contract	Public	Private	Public	Public	3-5
Lease	Public	Private	Shared	Shared	8-15
Concession	Public	Private	Private	Private	25-30
BOT/BOO	Both	Private	Private	Private	20-30
Divestiture	Private	Private	Private	Private	Indefinite

The success of PPP model implementation in FSM projects can depend on many aspects, political will, public perception, leadership in executives, transparency, the propensity to take a risk, and market potential. Government has to choose the partner carefully. The project execution will succeed depending on a clear feasibility study, creative project design and business plan. Government has also to ensure conducive policy environment, transparent legal framework, and good governance with accountability. There should also be a procedure for continuous re-assessment of the partnerships to ensure that the PPP meets the objectives of all stakeholders.

Figure 5: Structuring Process for FSM Project



The implementation process of a PPP project should start with a feasibility study. Based on the findings of the PPP feasibility study, LGIs need to decide whether to bundle or unbundle the PPP project and assess whether the revenue stream from the customers is enough to make a commercially feasible PPP project. Subsequently, it is essential to evaluate the possible options for investment and ownership of the capital asset.

During this process, it is essential to conduct market sounding and extensive stakeholder consultation. After that is necessary to finalise the payment structure and duration of the PPP project. Finally, it is necessary to identify different project risks and conduct risk management and allocation process. Through following such careful project implementation process, a qualified PPP partner can be selected. A good PPP partner should be value-based with significant corporate experience and resources and successful past performance.

5 Implementing PPP in FSM

This chapter discusses the possible implementation process for PPP projects in the FSM sector. As PPP is a relatively new concept in the FSM sector, it is essential to plan the project and then conduct the transaction process properly. This chapter will discuss the necessary project development and implementation process for FSM PPP projects.

5.1 Indicative Role of LGIs in PPP

For attracting private sector partner, LGIs need to provide different project support. Often it is considered that LGI support is only essential during the initial stage of the PPP project. However, as PPP is a long-term partnership between the private partner and the public sector, LGIs need to support the project continuously. Beyond contract award, ongoing, cost-effective support to private operators is key for ensuring the viability of PPPs. For example, support in demand creation, ensuring the availability of enabling infrastructure (such as transfer stations, accessible treatment facilities), or enforcing against alternatives (such as open defecation, illegal sludge dumping, or poor-quality emptying services) is very important for the successful implementation of a PPP project. Other key supports from LGIs include the following:

Provide land for Constructing FSTP: As FSTP requires significant area, it is essential to ensure that private sector operators have access to required land. From the private sector's perspective, purchasing a big piece of land near the municipalities can be a time-consuming task. Besides, such purchase will increase the requirement for equity capital for the private sector. Considering this issue, ideally, the land for the FSTP should be provided by the government. In return of this land, the private sector can provide a fixed annual contract fee (ACF) as payment to the government.

Contribute to the FSTP Construction Process: Along with providing land for FSTP, the government can also play the leading role in constructing the FSTP. If the government constructs the FSTP, then it will reduce the commercial risk for the private sector. It will also ensure very minimum equity requirement at the initial stage for the private sector. As FSM is a relatively new sector for PPP investment, it is very important to reduce the commercial risk for the private sector. In future, possibly the commercial risk of FSM project will decrease. During that time, several private companies will gradually enter the FSM market, leading to greater industry expertise and experience among private entrepreneurs. When the FSM industry reaches such maturity, then possibly the government can ask the private partners to provide the construction cost for FSTP.

Provide Land for VT Parking: For FSM project, the private sector will need significant land for parking the VTs. The proper parking facility will ensure adequate management of these crucial assets, leading the efficient service delivery process. As it can be difficult for the private partners to manage such parking facility, the government should play a leading role in arranging the parking space for VTs. Ideally; the FSTP should be constructed in such a manner that it contains necessary spaces for parking all the VTs.

Create Market Awareness for Scheduled Desludging: Government needs to play a crucial role in raising awareness on the importance of the FSM among the city dwellers. LGI's need to support the private sector in the market awareness program and promote the concept of scheduled FS collection program. As citizens are not familiar with the scheduled FS collection progress, it is essential first to assess the behavioural aspects of the community members and carefully prepare market awareness program.

Undertake the PPP Project Development Process: LGIs need to play a key role in terms of developing the PPP project in a bankable manner. For this purpose, it is crucial to conduct a feasibility study to understand the project aspects and risks. Subsequently, LGIs need to collect market feedback from potential bidders and other project stakeholders. Another essential aspect is to properly market the project among the prospective bidders through doing different project promotional activities.

Spread PPP Understanding within the LGIs: For addressing the second-generation sanitation challenge, the private sector can play a very important role. Appropriate and adequate management of FSM PPP project is imperative for the protection of human and environmental

health. Considering this issue, it is essential to learn the PPP concepts and then spread the understandings of PPP project among the other departments of LGIs.

5.2 Role of Private Sector for Providing Capital for VT

As the private sector is responsible for emptying and transportation (ET) process and obtains direct payment for the service, the private sector should be solely responsible for purchasing new VTs. Initially, the private sector can start the business with the VTs provided by the LGIs. In future, the quantity of FS is expected to increase significantly. If the private sector offers efficient service, then ideally the demand for ET service will increase and based on the market demand situation, the private sector will need to expand the VT fleet. Instead of the private sector if the City Corporation purchases the VT, then that can affect the collection ratio target. Before purchasing any VT, the City Corporation needs to prepare the project proposal and get approval from the concerned ministry. This entire purchase process can take considerable time and can affect the collection ratio target of PPP contract. For avoiding such a scenario, it is important to assign the VT purchase responsibility to the private partner.

5.3 PPP Opportunities and Risks for Municipalities and Entrepreneurs

In most cities of the cities of Bangladesh, implementing agencies and local municipalities struggle to deliver adequate FSM services. For twenty years, Chittagong City Corporation (CCC) had only one vacuum tanker to serve the entire city. In Dhaka, initially, FSM service was mainly provided by a few NGOs, who often had difficulty in scaling up city-wide coverage. PPPs offer a reliable programme for addressing this constraint and ensure adequate treatment of FS. Through a carefully draft PPP project, the government can incentivise the private partner to introduce innovation in the project management process. Other Advantages include allowing public institutions to meet mandates efficiently and cost-effectively that ensures services are pro-poor and sustainable. Entrepreneurs with interest in expanding into FSM service provision are likely to be drawn to urban areas due to the service demand, and potential to scale up.

However, it is essential to plan the PPP project development and transaction process carefully. Without a carefully planned PPP project, there is a possibility of failed PPP contract. The PPP contract agreement between Khan Agriculture Products Limited and Jashore Municipality highlights the classic example of a failed PPP project, where the private partner was unable to initiate the project operation. Such project failure can create service risk for general people as they will not be able to obtain FSM service efficiently. In the long run, such project catastrophes can also discourage qualified private partner in participating future FSM PPP project bid. For minimising this risk, it is crucial to plan and implement any FSM PPP project and systematically invite qualified private partners in the bidding process.

5.4 KPI for the Treatment of FS Liquids and Solids

PPP is a project delivery method where the private partner's payment is integrally linked to compliance of KPIs. Linking payments to well-specified KPIs is important for achieving project objectives. Considering this issue, while implementing the PPP project, it is very important to carefully design the KPIs. In the FSM sector, the ultimate aim of government from the PPP project is to ensure safe treatment of toxic FS. It is also essential to ensure that all the FS produced in a specific geographical area is properly treated and the staffs involved in this process are following safe and environmentally sound FS treatment process.

At present, the PPP market in FSM is at its infancy. As a result, its technical and commercial concepts have not yet matured. Typically, a PPP will have performance targets or KPI as the business will have to be driven by outputs monitoring rather than inputs monitoring. The LGI will monitor these KPIs for ensuring the satisfactory operation of the FSM sector in terms of at least two core aspects of their mandate (a) high achievement of FS collection in Stages III and

IV, and (b) safe treatment of toxic FS in Stage V[4]. At a later stage, during the drafting of the PPP Contract, sufficient provisions need to be kept for ensuring that LGIs or acceptable third parties monitor the KPIs and adequate levels of enforceable penalties are included.[5] Arriving at these parameters will require a substantial amount of discussions to take place between government, private investors, banks and technical experts. This initial report on the feasibility of PPP in the FSM sector will provide a general direction in the technical areas, that are subject to further discussions with technical experts, such as, BUET ITN, SNV, LGI, public health officials[6], potential investors. In a PPP, the treatment system has two end products, namely:

1. Biosolids
2. Treated Water

It is important to design KPIs for both biosolids carefully and treated water from the FSTP. If the private sector fails to achieve these KPIs, then the private sector should receive formal complaints and possibly need to pay a penalty fee for non-compliance of KPIs. Repeated non-compliance of these KPIs can lead to severe contractual provisions, including contract terminations because of private partner's non-compliance. These provisions should be clearly outlined in the PPP contract document. The possible KPIs for biosolids and treated water are discussed below:

5.4.1 KPIs for Bio Solids

Biosolids are dried sludge from drying beds, and which are stored for a period of 4-6 months for further stabilisation and reduction of pathogens. Sludge removed from drying beds is stored as heaps in sludge storage yards, during which helminth eggs and other pathogens get deactivated, or their effectiveness reduces. Biosolids can be used as a soil conditioner for farming as they are a rich source of nitrogen, carbon and phosphorus. The characteristics of treated, safe biosolid and potential KPIs are provided below:

Table 3: Potential KPIs for Bio-Solids

Solids KPI Number	Parameters	Characteristics
SKPI 1	pH at 5 % suspension	5- 7
SKPI 2	Moisture %	10 - 30 %
SKPI 3	Organic carbon %	10 – 25 %
SKPI 4	Organic Nitrogen	2- 5 %
SKPI 5	Phosphorous	0.2 – 1%
SKPI 6	Bulk Density (Specific gravity)	0.65 – 0.9

In each month, the LGIs should randomly check the quality of Bio-Solids from the FSTP. If it has been observed that the private sector is not following the treatment KPIs for Bio-Solids, then the LGI can take necessary actions as outlined in the PPP contract document.

5.4.2 KPIs for Treated Water

Water from liquid treatment modules is stored in a collection tank from where it can be reused for irrigating plantations in nearby farmlands and also can be discharged into a nearby drain. The characteristics of the treated, safe water are as follows:

[4]It is noted that Reuse in Stage VI is not identified as a core area for LGI as it involves production of either fertilizers or energy, both under the mandate of other ministries
[5]In order to maintain uniformity within the large number of LGIs in Bangladesh, it will be appropriate for the Local Government Division to approve and issue Model PPP Contracts for the FSM sector.
[6]A relevant agency under the Ministry of Health

Table 4: Treated Water Characteristics

Liquids KPI Number	Parameters	Characteristics of treated water
LKPI 1	PH	6.5-9
LKPI 2	Temperature	25 -35 degree
LKPI 3	BOD at 5 days mg/L	<30
LKPI 4	COD mg/L	<50
LKPI 5	Total suspended solids mg/L	<20
LKPI 6	Faecal coliform per 100 mL	<100
LKPI 7	Total Nitrogen mg/L	< 10

In each month, the LGIs should randomly check the quality of treated water from the FSTP. If it has been observed that the private sector is not following the treatment KPIs for treated water, then the LGI should take necessary actions following the guideline outlined the PPP Contract document.

5.5 KPIs for Collection Ratio and Proposed Targets

Currently, most of the LGIs have very poor FS Collection performance. For instance, based on the findings from the stakeholder consultation in Khulna, currently, KCC is collecting only 2% of the total FS produced by the city dwellers. The remaining 98% FS is not being collected and hence properly treated, leading to health hazards for the citizens. Annual FS collection ratio is calculated by finding the total amount of FS annually collected by the specific LGIs and dividing that by the total FS produced by the city dwellers. To address this issue, it is imperative to increase the Faecal Sludge Collection Ratio (FSCR). Only through increasing FSCR, it is possible to address the current health hazard in different LGIs. Considering this issue, it is proposed to include the collection ratio as one of the KPIs for the PPP Contract. As part of this process, the total number of FS annually generated in KCC should be studied, and that number should be specified in the PPP contract document. For KCC, the following minimum FSCR has been proposed as the KPIs:

Table 5: Faecal Sludge Collection Ratio (FSCR) Targets

Time Period	Minimum FSCR Targets
Year 0 (base year)	2%
Year 1	10%
Year 2	20%
Year 3	30%
Year 4	40%
Year 5	50%

In order to strengthen the FSM through increasing the collection ratio and avoiding the involvement of non-mechanical desludging for cleaning the septic tank, the private partner needs to add vehicles based on the market demand. With these additional VTs, the private partner would be able to properly manage desludging services and also create awareness in the public about FSM. If it has been observed that the private sector is not fulfilling KPIs for collection ratio, then the LGI can take necessary actions as outlined in the PPP contract document.

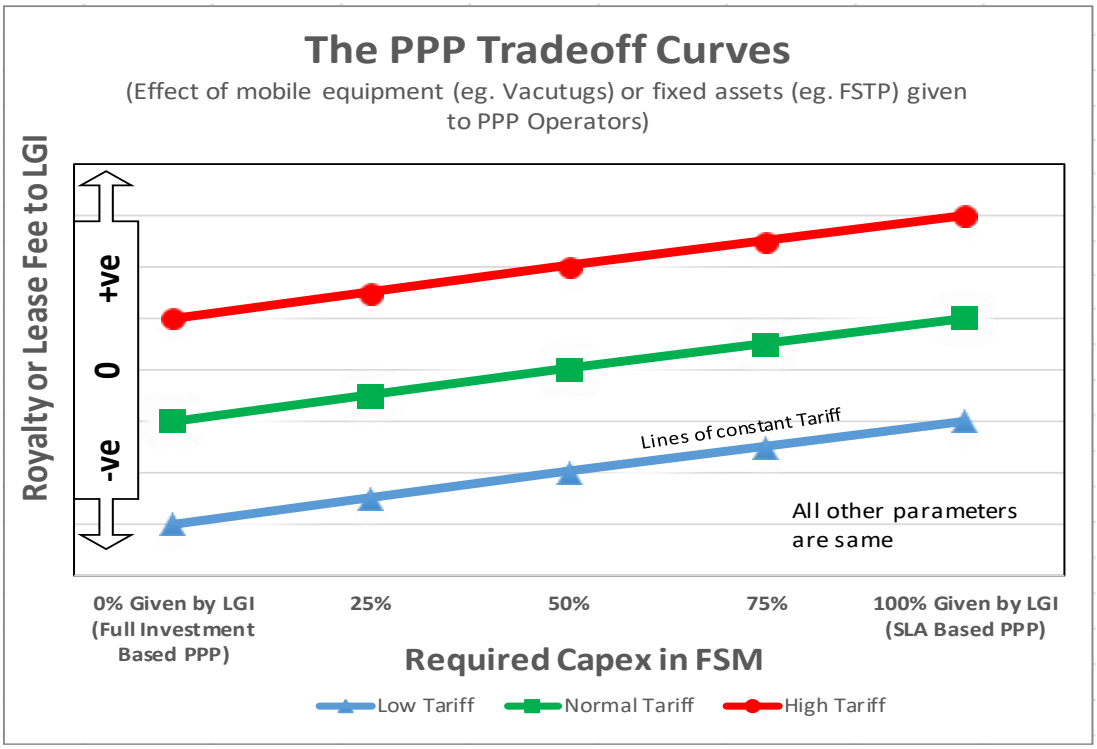
5.6 KPIs for VT Operators

Currently, most of the manual Emptiers use very minimum protective gears. Often, VT operators do not follow the required health standards while conducting desludging services. In a PPP Contract, there should be specific KPIs for minimising such behaviour. The private partner must provide necessary protective gears to the VT operators and train them regarding hygiene standards and safe collection procedure. In fact, appropriate risk mitigation measures, such as the use of protective gear, hygiene standards and provision of training, would probably only marginally increase the capital and operation costs but would have significant positive health and economic impacts.

5.7 Capital Equipment and Facilities Provided by LGI

In an FSM PPP project, if the LGIs play the leading role in terms of providing the capital expenditure, then ideally the LGI should receive relatively more payment, through royalty or lease payment from the private partner. On the other hand, if a private partner plays a key role in terms of capital expenditure, then the government should receive very minimum payment, through royalty or lease payment. As the private sector is absorbing the capital investment risk, ideally, the return for the investor should be higher to compensate for this risk. The illustration below depicts the trade-off between capital provided by LGI, the different tariffs allowed under the PPP Contract and the royalty payable to the LGI.

Figure 6: PPP Project Trade-Off Curves



The capital given can be VTs, fixed assets such as FSTP, land area for FSTP, parking, cleaning, and offices. In determining the VTs given by the LGI, care should be taken to establish the total number of VTs required to meet the FSCR Targets and the proportion of it that will be given by the LGI.

5.8 Reuse or Dispose

Reuse or dispose alternatives are in the last stage (Stage VI) of the FSM value chain. In the reuse option, two alternatives are possible (a) production of organic fertilisers and (b) production of briquettes for energy. Both these alternatives fall outside the mandate of the LGIs and hence should be treated as non-core to the LGI primary focus for maximising the collection of FS by increasing the FSCR and then detoxifying it through six (6) SKPI and seven (7) LKPI. Hence, Stage VI should be viable in its own right to be taken up. Its benefits should be higher than its costs i.e. B/C ratio should be greater than 1.

As FSM PPP is a very new concept in Bangladesh, initial PPP projects should be commercially and technologically simple. With simple commercial and technological parameters, it is essential to build the private sector's confidence in the sector first and mobilising a good number of credible investors. Depending on the project objectives, either the reuse or dispose option can be included in the project.

5.9 Bid Process in Khulna FSM Project

For attracting quality investment, it is very important to conduct the bid process following Bangladesh's Procurement Guidelines for PPP Projects, 2018 and PPP Law 2015. According to Procurement Guidelines for PPP Projects, 2018, a feasibility study of the PPP Project must be

carried out to test the overall viability and to finalise the scope and commercial structure of the PPP Project. Considering this issue, we propose a recommendation for conducting a detailed feasibility study for KCC's FSM project. It is essential to develop the draft RFP document and the draft PPP contract based on the outcome of the feasibility study and market feedback.

In the draft RFP document of KCC, different financial criteria, including the net equity value of private partner, have not been incorporated. Along with technical capacity, it is also important to assess the financial capacity of a bidder during the bidding stage. Without the required financial capacity, it may not be possible for a private partner to properly operate the FSM business.

According to Bangladesh's Procurement Guidelines for PPP Projects, 2018, the Proposals submitted in response to the RFP should be received within a minimum of 42 (forty-two) days from the issue of the RFP document. For KCC's FSM PPP project, this timeline has not been followed. It is very important to provide the required proposal preparation time to the potential bidders. As FSM is a new sector for PPP investors, it is essential to provide at least two to three months of preparation time to the prospective bidders, with care taken to promote the project to potential investors and to clarify the business concepts around the PPP project. A key document that should be included with the RFP is the draft PPP contract. For KCC's FSM project, the draft contract document has not been provided with the RFP document.

During the pre-bid meeting, it is essential to provide further information about the PPP Project and the bidding process. These additional documents can include an Information Memorandum (IM), project presentation slides and other applicable documents. During the pre-bid meeting of the Khulna FSM project held on 5 Dec. 2019, the authorities provided limited written documents to the prospective bidders. During such a meeting, it is essential to explain to the bidders the project's commercial structure and bidding parameter(s). Another aspect is to describe the bid document forms in detail.

5.10 De-risking the Major Risk Element in an FSM PPP Contract

A major risk factor for the FSM business is the management process of the VTs after the project period is for PPP is over. If the project period is short i.e. significantly smaller than the economic life of the VTs, this risk is magnified. From the private sector's perspective, purchasing the VTs will be the significant cost component for the FSM project. Such purchase can be essential to match with the service penetration and to reach the FSCR Targets. As FSM PPP projects have a small contract life (for instance, five years), it is important to specify how these assets will be managed after the contract period.

For decreasing the risk of termination/expiry/ short contract period for the private sector, we are providing a methodology that could de-risk the purchase of VTs for the private sector. We propose to set up an agreed price for the VT fleet. The VTs can be divided under different categories depending on their capacity. For the purpose of this study, VTs has been classified under four categories.

The first category can be VTs with 1000 litre capacity. It has been proposed that the standard VTs with 1000 litre capacity should have a unit agreed price of 15 lakh in a new condition. This first category has also been recognized as the standard size of VT in this report. Larger VTs will have different agreed price, which is shown in the following table:

Table 6: Proposed Sample Agreed Purchase Price Calculations for VTs

Size of VT (Litre)	Proposed Agreed Price (Sample)
1000 Litre VT	BDT 1.5 Million
2000 Litre VT	BDT 2.5 Million
5000 Litre VT	BDT 4 Million
7000 Litre VT	BDT 5 Million

Based on the agreed price, the depreciation of the VTs will be calculated using an economic life of fifteen years. If the PPP contract expires or is terminated before this economic life, the investor can either take the VTs with them (option one) or ask for compensation for the VTs from the LGIs (option two). If the investors prefer to use option two, then the private investor will be

compensated for his Purchased Assets for the Remaining Value (RV) of the purchased asset. RV is defined as the depreciated value of agreed price per VT over a lifetime using a straight-line basis (15 years proposed). This RV will be paid by LGI either directly by LGI or by the incoming investor if LGIs wants to bring in a new private investor for the FSM. The table provided below provides a sample calculation for Remaining Value.

Table 7: Sample Calculation for Remaining Value

Economic Life of VT	15 years				
Year of PPP Contract	2020				
Year of Calculation	2025				
Purchased Assets (VTs)	**Agreed Price (BDT)**	**Year of Purchase**	**Number of Years Used**	**Depreciation (BDT)**	**Remaining Value (BDT)**
VT_{1000}	1,500,000	2021	4	400,000	1,100,000
VT_{2000}	2,500,000	2022	3	500,000	2,000,000
VT_{5000}	4,000,000	2022	3	800,000	3,200,000
VT_{7000}	5,000,000	2023	2	666,667	4,333,333
VT_{2000}	2,500,000	2024	1	166,667	2,333,333
VT_{5000}	4,000,000	2024	1	266,667	3,733,333
VT_{1000}	1,500,000	2023	2	200,000	1,300,000
REMAINING VALUE					**18,000,000**

5.11 Performance-Based Monitoring and Payment Mechanism

For implementing a successful PPP project, it is essential to monitor the performance of the private partner. If the private partner does not provide the FSM service following the standards specified in the PPP contract, then there should be a penalty provision. In addition, the government also needs to support the project through carefully planned contractual provisions. The following table discusses some of the likely project risks and mitigation:

Table 8: Performance-Based Monitoring and Payment Mechanism

Risk	Mitigation	Allocation of Remaining Risk
The private partner consistently fails to meet FSCR Targets	The sanitation department of LGIs needs to regularly review the causes of failure. The FSCR targets should be set realistically and be achievable.	Fines can be designed for breaches that result from private partners fault, otherwise excused. Persistent breaches can lead to contract termination
The private partner is not treating the sludge following the Bio Solid and Water KPIs i.e. SKPI and LKPI	The sanitation department of LGIs needs to regularly measure the properties of treated sludge (Bio Solid and Water)	If the sludge does not meet specified KPIs, then a written warning should be given, followed by fines. Persistent breaches can lead to contract termination
Private partner does not clean household tanks as per the schedule	After providing the service, the private partner needs to collect the client's signature. There will be a penalty mechanism if the private partner fails to collect a signature from at least 95% of clients. LGI need to conduct random inspections of households Establishing a control centre where clients can lodge complaints.	A penalty will be imposed if discrepancies are found during random sampling, or if complaints are not dealt in a timely manner. Large or persistent breaches can lead to contract termination.

Private partner spills and dumps septage during the transportation process	Establishing a control centre where clients and local people can lodge complaints.	The LGIs must investigate complaints of spillage and illegal dumping. A penalty will be imposed if the private partner conducts spillage and unlawful dumping Persistent illegal dumping can lead to contract termination.
LGI decides to discontinue the contract for reasons unrelated to the private partner	Frequent communication and a monthly meeting between LGI and private partner.	The LGI needs to provide at least three months notice. The private partner needs to be compensated for VT investment based on the remaining value of VT.
Because of illegal connection to the waterbodies the residents are not interested in conducting desludging	LGI should provide guideline regarding illegal connection to the water bodies	LGI should assist the private partner in conducting desludging activities
Private Partner do not obtain necessary regulatory support from the government for conducting desludging	LGI should publish a detailed guideline regarding the deluging procedure, including the frequency of desludging, desludging fee and payment mechanism	LGI should assist the private partner in conducting desludging activities
Cost of emptying and transportation increases over the course of the contract	Adjustment of emptying and transportation tariff based on annual inflation. Inclusion of a tariff escalation clause.	The private partner would be responsible for bearing the cost escalations within the negotiated period.

6 Financial Analysis

This chapter presents the details of commercial viability assessment of an FSM PPP project. Ideally, a financial model should be prepared based on the extensive market study, which was not the case for this project. Therefore, the finding from this financial analysis should be carefully interpreted. As KCC is the key priority area for the Client, we have prepared the model using the available data from Khulna and the assumptions of this model may not be applicable for other cities. For the FSM PPP project, it is essential to assess different commercial parameters, including the revenue sharing process, and internal rate of return of the bidder. It is necessary to ensure that the private sector has sufficient incentive to bid for the project while fulfilling the LGI's objectives for the project. Based on the commercial and financial assessment, the chapter highlights the results of the financial model and provides a recommendation on the viable PPP procurement model. A financial viability assessment of the project has been conducted to provide a validation of whether:

- the operation and maintenance of the project can offer sufficient risk-reward balance to a prospective private sector partner to facilitate private sector commitment to the project;
- the private sector is likely to be incentivized to bid for operating and maintaining the project while adhering to meeting the LGI's objectives from the project;

The financial analysis would require a large number of assumptions to be realistically made at this stage, to reflect the actual financial environment at the time of project operation. The assumptions have been discussed in 6.2. With these assumptions and the above framework, a financial spreadsheet is prepared, which helps in determining the PPP structure for the project.

6.1 Components of the Base Financial Model

For financial analysis, we have prepared a base financial model that can serve as the basis for the project's feasibility. Ideally, a financial model should be prepared based on the extensive market study, which was not the case for this project. Therefore, a base model has been prepared, which does not include any scenario and sensitivity analysis. The financial analysis included the identification and valuation of the revenue and costs arising from the proposed project.

The financial analysis undertaken for FSM sector will employ a spreadsheet-based model providing: (1) a projection of each component of cost and expenses based on a consistent set of background financial/economic assumptions; and, (ii) the revenue generated by a given structure of revenue sources. The results of combining cost and revenue projections are presented as output indicators.

The model contains interlinked sheets keeping in view the available data and information. The sheets of the model are:

Input and Input Support Sheets	• FSM Treatment Plant Cost • Project Assumptions • Personnel and Administrative Cost Sheet
Processing Sheets	• Debt Service for the project • Revenue from the FSM Treatment • Depreciation • O&M
Result Sheets	• Income Statement • Cash Flow • Sensitivity Analysis • Summary Output Sheet

Sensitivity analysis has been included in the model to test its sensitiveness on change of different important project parameters. The input and input support sheets accommodate all the basic inputs of the project required for the financial model. These inputs have a connection with other

sheets (processing/intermediate calculation) where specific calculations will be made. Then the outcomes of the individual sheets are connected to the result sheets to obtain the final results.

The model provides analysis and charts, which can indicate the viability of the project, depicting the relationship with the revenue and the results of different options. We carried out financial modelling and provided a consolidated account of the financial viability of the project comprising the following:

- Assumption sheet – capturing key economic and financial inputs required for the FSM Treatment manufacturing plants financial model
- Operation and maintenance costs of the plant
- Financing plan
- Working Capital – projections of working capital requirement and the eligible bank borrowing for financing the same, and the gap to be met out of long-term sources.
- Revenue estimates of the FSTP plant
- Income statement
- Balance sheet
- Cash flows statement
- Book Depreciation of the plant
- Tax
- Key indicators – would present the key financial viability indicators at a consolidated place
- Scenarios/sensitivity sheet – allowing development and evaluation of scenarios and sensitivities for assessing project risks and their impact on financial viability indicators for the FSM Treatment plant project

6.2 Assumptions

It is important to note that the consultant team prepared the financial model for its internal understanding. Ideally, a financial model should be prepared based on the extensive market study, which was not the case for this project. The original TOR of this project had no provision for conducting financial model. Still, the consultant team voluntarily prepared a brief financial model based on the available data. As the model has not been prepared with rigorous market study, the findings of this model should be carefully interpreted. As the consultant team have limited project data, the consultant team prepared a base financial model for this project and have not conducted scenario and sensitivity analysis.

While preparing the financial model, we have first defined the standard VT capacity. For this financial model calculation, a VT with 1000 litre capacity or VT_{1000}has been defined as standard VT. Other VT with more FS collection capacity has been standardized in terms of the capacity of the standard VT. For instance, a VT with a capacity of 5000 litres has been defined as five standard VT. As part of the feasibility study, the consultant team assumed that Khulna city corporation have four Vacutugs.

In the financial model, it has been assumed that the private partner will provide a Fixed Royalty as a fixed annual payment for using the existing project assets. The model assumptions have been made based on the data provided by the Khulna City Corporation and field visit experience. In a PPP project, it's important to recruit the most efficient individuals and provide an incentive for continuous performance improvement. Considering this reality, compared to public sector projects, in a PPP project, the project staffs usually receive a higher level of salary and other benefits. Existing project assets include the FSTP with planted drying bed, project office, VTs and other project assets. However, existing project assets for KCC will not include the unplanted drying bed as it will remain outside the PPP project.

Along with fixed royalty, the private partner will also provide a variable royalty payment to the KCC. This variable royalty payment can be a certain percentage of Emptying and Transport revenue generated by the private partner. Based on the financial model, we propose that the Fixed Royalty will be mentioned in the RFP document, and any potential bidder must pay this amount to KCC. However, the variable royalty payment will be the bidding parameter for this project. This effectively means that technically and financially qualified private partner offering the highest variable royalty payment will be selected as the preferred bidder. However, it is essential to note that for KCC's PPP project, the bidding process has already been initiated and

the bidders are expected to submit their technical and financial proposal in the fourth week of December. Considering such a proposal submission deadline, it may not be possible for KCC to restructure the project and incorporate the concept of fixed royalty and variable royalty.

6.2.1 Details of Revenue Projections

The financial feasibility analysis required a large number of assumptions to be realistically made at this stage, to reflect the actual financial environment at the time of implementation. The model assumes that the Faecal Excretion Rate (FER) for KCC will be 0.08cum/cap.yr. Also, the current population of Khulna was assumed as 1.5 million, which will grow at 1% rate annually. The proposed project is expected to obtain revenue from emptying and transportation fee from the households, and accordingly, the financial model has been prepared. We have assumed that the private partner would collect emptying and transportation fee following the approved tariff provided by KCC.

Table 9: Tariff Rate for Emptying Service

Size of the Vacutug	Unit	Amount
VT 1000 L	cum/trip	1,000
VT 2000 L	cum/trip	2,395
VT 5000 L	cum/trip	4,095
VT 7000 L	cum/trip	5,295

In addition, the preferred technological option for KCC would be planted would be drying beds. As there is no scope of reuse from planted drying beds, the private partner will not be able to obtain any additional revenue from the treated sludge.

6.2.2 Details of Cost Projections

For a private partner using VTs for emptying and transporting sludge, the key capital cost is the VT itself. The operational costs of a business using VTs include labour (two to three people per truck), fuel, and periodic repair and maintenance of the VT. VT costs are expected to be linear, i.e. with more VTs, the costs will be proportionately increased, but independent of individual sizes of the VTs. Minor costs incurred mostly include telephone expenses and advertisement costs (printing leaflets). In PPP FSM project, the VT operators and assistant's salary will play a very important role in terms of determining the total O&M cost. The item-wise O&M for VT operation is provided below:

Table 10: O&M Cost for VT Operation

O & M cost for emptying services	Unit	Amount
VT operator Salary	BDT/m	25,000
Driver Salary	BDT/m	30,000
Helper	BDT/m	15,000
Marketing officer Salary	BDT/m	20,000
Repairs and Maintenance per VT	BDT/m	12,917
License fee	BDT/yr/VT	30,000

The capital costs of FS treatment plant are towards construction – to build receiving stations, drying beds and storage of dried FS. In total, the approximate total capital expenditure is BDT 43 million. Although the capital costs of an FSTP are considerably higher than the emptying and transport businesses, O&M costs are relatively lower due to lower maintenance cost, especially of pond-based systems with almost no expense on fuel/energy for pumping. Most of the O&M costs of a treatment plant are towards labour cost. This may significantly change if a different technological option is adopted or if there is a significant change in the scale of the treatment plant.

Besides, for operating the FSTP, the model assumed that there would be operating, and management (O&M) cost mainly due to the salary expense of FSTP operator, Accounts officer and Guard. The key O&M cost for the FSTP is provided below:

Table 11: O&M Cost for FSTP Operation

O & M cost for FSTP	Unit	Amount
Salary FSTP operator	BDT/m	20,000
Salary Accounts Officer	BDT/m	25,000
Salary Marketing officer	BDT/m	25,000
Salary Admin Officer		20,000
Security Guard	BDT/m	15,000
Electricity Bill	BDT/m	5,000
Office Support	BDT/m	30,000
Repairs and Maintenance	BDT/m	62,500

We have assumed that the FSCR for KCC will gradually improve, which will increase the annual revenue for the private partner. The current collection ratio is just 2% of total FS generated in the KCC area, which is expected to increase in future. For KCC, the following FSCR has been assumed:

Table 12: FSCR Targets

Time Period	FSCR Target
Year 0 (base year)	2%
Year 1	10%
Year 2	20%
Year 3	30%
Year 4	40%
Year 5	50%

With such an increase in the collection ratio, the project will require additional VTs to conduct emptying and transportation process. The year-wise projections for the number of VTs are provided below:

Table 13: Year-Wise Projections for the Number of VTs

VT Fleet Planning	Y1	Y2	Y3	Y4	Y5
VT_{1000}	1	1	2	2	3
VT_{2000}	2	2	4	5	5
VT_{5000}	1	2	3	4	5
VT_{7000}	1	2	2	3	4
Total no. of VT	**5**	**7**	**11**	**14**	**17**

Currently, in KCC, the available number of VTs is 4, which is expected to remain the same up to year 1. Then gradually, the FS collection ratio is expected to increase, which will lead to an increase in the VT fleet demand. Therefore, in year two, the private partner will need to purchase an additional four VTs. With the increase in collection ratio, in year three, the private partner will need to purchase three more VTs, with a total number of VTs reaching twelve. In year four and five, this collection growth pattern will remain the same, and each year the private partner will need to include three more VTs in the VT fleet. We have used an agreed price for VT, which has been previously explained in chapter four. For instance, for this model, VTs has been divided under four categories, like the standard VTs with 1000 litre capacity has a unit agreed price of BDT 1.5 million. While larger VTs will have different agreed price, which is shown in the following table:

Table 14: Proposed Agreed Price for VTs

Size of VT (Litre)	Proposed Agreed Price
1000 Litre VT	BDT 1.5 Million
2000 Litre VT	BDT 2.5 Million
5000 Litre VT	BDT 4 Million
7000 Litre VT	BDT 5 Million

Based on the agreed price, the depreciation of the VTs has been calculated using straight-line depreciation over an economic lie of fifteen years.

6.3 Results

Based on the base financial model, we calculated the equity IRR and Project IRR for KCC's FSM project. Calculation of the internal rate of return considering the cash flows net of financing provides the equity IRR. On the other hand, the project IRR gives the rate of return from the whole project. It calculates the rate of return, considering the cash flows from the project only.

Based on the financial model, the project NPV for the base case is BDT 3 million. This NPV indicates that the project to be financially profitable, and the forecasted earnings generated by this project surpasses the anticipated costs. The Project IRR of 14% indicates the earning on the total project value, which will be received by both Debt and Equity holders. In contrast, Equity IRR of 16% infers the earning of Equity Shareholders only on the investment value. In this case, equity shareholders are going to earn 16% on their investment.

Table 15: Equity IRR and Project IRR for Reference Financial Model

Indicator	Base case
Project NPV	BDT 3 million
Equity IRR	16%
Project IRR	14%

Based on the base financial model, it can be concluded that the project has an average return. It is important to note that the project's financial viability is a function of approved tariff structure. Any change in the approved tariff structure can change the financial viability of the project. The base financial projection has been conducted using the following tariff structure:

Table 16. Tariff Rates for Emptying Service

Size of the Vacutug	Unit	Amount
VT 1000 L	cum/trip	1,000
VT 2000 L	cum/trip	2,395
VT 5000 L	cum/trip	4,095
VT 7000 L	cum/trip	5,295

If we compare this return with the National Savings Schemes[7], it can be concluded that the potential private investor will obtain a very minimum return for absorbing significant market risk. Since FSM is a very new industry, it is important to prepare an FSM PPP project in such a manner that that project is financially attractive for the industry. Considering the fact that the project has an average return, it is important to reduce the risk profile of the investors through a carefully prepared risk-sharing mechanism.

[7] http://www.nationalsavings.gov.bd/site/page/5d8f6cf8-dbea-49a6-98bb-b5fc76fbeb4c/%E0%A6%95%E0%A7%80-%E0%A6%AB%E0%A6%BF%E0%A6%9A%E0%A6%BE%E0%A6%B0

7 Preliminary Recommendations for Incorporating PPP in FSM

This chapter provides some recommendations for implementing PPP projects in the FSM sector. This chapter extends the understanding already provided in Chapter four. In fact, this chapter includes some additional concepts that can be used to ensure further improvements in the contractual structures of future PPP project.

Penalty for Illegal Dumping: There should be a stiff penalty for illegal FS dumping in the PPP contract document. For the first instance of illegal FS dumping, the private partner should obtain a formal notice from KCC and pay a penalty of 50,000 taka. This monetary penalty should increase by 100% with each repeated illegal FS dumping. After five proven instances of illegal FS dumping, the KCC should have the right to terminate the PPP contract based on the private partner's default.

Responsibility of FSTP Design Flaws or Under Capacity: For KCC's FSTP project, the KCC should be responsible for any design flaws of the FSTP. As the KCC has constructed the FSTP, any future design flaws in FSTP should be addressed by the KCC. As an example, for the collection of the proposed targets of FS, the FSTP could have inadequate handling capacity. In such a case, the KCC will need to provide alternative FSTP sites or to expand the existing facility. Additionally, the FSTP should be able to meet all the six SKPI and seven LKPI targets, when being operated on a satisfactory basis.

Sludge Disposal Process: For KCC's FSTP project, the treated sludge should be removed from the wetland after every seven years. KCC should be solely responsible for removing the treated sludge as the private partner do not have any ownership in the treated sludge.

Contract Extension Process: If the private partner achieves the FSCR targets during the contract period, then that will be considered as satisfactory performance for the private partner. With such satisfactory performance by the private partner, the contract of the private partner may be extended by another five years. Such an extension after achieving the collection ratio will provide an incentive for the private partner to accomplish the project's KPI.

Bundle or Unbundle the PPP Project: PPP projects may be organized in a variety of ways, depending on the level of integration in the PPP project company. One of the critical arguments underlying PPPs compared with traditional procurement methods is that efficient risk transfer and task integration provides the private partner with a clear incentive to develop innovative solutions that can deliver more infrastructure with fewer resources in the long run. Hence, by optimizing long term incentives, and by letting each of the partners do what they do best, PPPs are often seen as a panacea for avoiding the time and budget overruns.

For FSM business, it is important to provide incentives to private partners. If we study the current KCC FSM project, then the project needs to address two critical challenges. First, the emptying and collection of FS need to be increased. It is crucial from the LGIs perspective to increase the collection ratio of FS. Currently, LGIs are collecting a very minimal percentage of total FS being generated. For instance, in KCC, the city corporation is collecting only 2% of the total FS being generated. Second, the PPP contract should ensure the effective treatment of all the collected FS.

For addressing both the challenges, the KCC can use a number of strategies. If the KCC makes the emptying and collection business a free entry (Stage III and Stage IV), then different individuals can easily enter this business, and healthy competition among different business will lead to service quality increase. For instance, KCC can make the emptying and collection of FS a free entry project and FSTP business a PPP project. With such a separate contract, possibly KCC needs to integrate these two ventures, probably through providing some tipping fee for the emptying and collection business and providing some viability gap funding or annual subsidy for the FSTP. As FSM is a relatively new concept in Bangladesh, integrating these two segments through a complex PPP model can be a difficult task at this moment and maybe more technically feasible in future. Another strategy can be to bundle these two aspects and offer a single contract

which involves emptying, collection and treatment. The current FSM PPP projects in KCC follow this strategy, where a single private partner is responsible for all these activities.

Possible Use of BOT PPP Mechanism: Before implementing any FSM PPP projects, the government needs to carefully conduct PPP option analysis. Based on the PPP option analysis, PPP procurement process should be formulated. One of the possible project implementation approach can be Build Operate Transfer (BOT) mechanism. In a BOT project, the private partner will build, finance, operate and maintain a facility for a fixed tenure. At the end of the fixed tenure, the FSM project will be transferred to the government.

Scheduled Sludge Collection Service: For VT Operators, access to containment systems is a time-consuming task as it usually takes around 10-15 minutes to locate the household and access point for desludging. Then the VT operators need to fit the PVC pipes properly, and after conducting the desludging, they need to remove the pipe. If the next desludging call is located in a distant place, they have to again repeat the same process. Such repetition of work can act as a bottleneck for FSM service delivery.

Considering this issue, scheduled (regular) service can be considered for KCC. Then, the VT operators will be able to provide service in all the households in a neighbourhood. Such planned sludge collection process can significantly reduce the Operating and Maintenance cost for the private partner.

Collection Process for Emptying and Collection Fee: After providing the Emptying and Collection service, the VT operator should collect the Emptying and Collection fee from the households and provide a written receipt. The VT operator should also provide an FS certificate to the household. The certificate should indicate the date of the next emptying service along with the contact details of the private partner.

E&T Tariff: The private partner should charge the households based on the approved tariff of KCC. Any non-compliance regarding this issue, including charging an excessive fee for the Emptying and Transportation service will lead to a breach of contractual terms. With such violation, the KCC can impose a penalty fee of 10,000 taka.

Use of Intelligent Maps: Using GIS data, septic tanks can be mapped across the city and colour-tagged to identify last cleaned date. This data can be used to send notices to the owner, as well as schedule cleaning services. This system can be operated at the control centre of the desludging operator and the local municipal office. The status/data need to be updated based on the requests received on a daily basis.

Control Centre: As part of the project, the private partner can set up a control centre. This centre can accept the requests for unscheduled desludging, customer complaints and feedback. Such a centre can enhance the quality of service and also improve customer satisfaction.

Part B: Contracts Review and Revision

1 Introduction

In part B of the report, the consultants review the existing PPP/SLA contracts and provide several recommendations for improving the existing contract. The consultant covers twenty-five crucial aspects that should be included in a standard PPP contract and compares the current FSM PPP/SLA contract of Khulna, Jashore, Kushtia, Jhenaidah and Faridpur municipality in these twenty-five essential aspects. Subsequently, the consultant also provides recommendations that should be implemented in any future PPP contract for these cities.

2 Review of Khulna Contract

	Name of the Topic	Recommendations for Improvement
1.	BIDDING PROCESS	
2.	Single Stage Bidding	The single-stage bidding, called Invitation for Bids (the **"IFB"**), is covered in article 22.1 of the Procurement Guidelines for PPP Projects, 2018 (the **"Guidelines"**[8]). According to article 27.1 of the Guidelines, the minimum time for bidding in an IFB should be 42 (forty-two) days. Consultant encourages a longer timeframe to allow more participation of Bidders, as well a two-stage bidding process that allows for interested parties to become pre-qualified.
3.	Marketing to investors	The Guidelines give a lot of importance to understanding the market for a PPP Project. In this respect, the following articles give importance to understanding the market: articles 15.1, 16.1, 26.1b, 26.2b, 26.3b, 32.1 and 57.5.
4.	Statement in the Notice inviting bids under IFB	Usually, the provisions of the PPP contract cannot be changed on a unilateral basis. It imposes a regulatory risk that the Private Partner cannot control.
5.	Draft PPP Contract	Article 26.1 of the Guidelines stipulates that the draft PPP Contract shall be included as part of the IFB. This is to ensure that the Bidders become familiar with the terms and conditions of the Project.
6.	Negotiations (section 6.2 of RFP)	This clause is very open-ended. Such negotiations on scope are not desirable as it makes the price proposal invalid. The scope of work (the **"SOW"**) can be very much altered with such negotiations.
7.	FSTP Operation & Maintenance (section 6 (ii) of RFP)	The business model has to be made clearer
8.	Bid evaluation criteria	Usually, bids are evaluated on the basis of (a) qualifying to bid (b) technical responsiveness of the bid and (c) financial proposal
9.	Providing data and information to Bidders	Hardcopy of the ppt or other reports such as surveys, feasibility studies, and research reports were not provided to the Bidders.
10.	Queries from Bidders	It is normal for a Contracting Authority to receive queries from Bidders in writing and respond to the queries in writing. Responding to queries was not carried out in the bidding process.

[8] Initial caps imply a defined term. In cases where the definition is not found within this document, the term used is the same as in the Guidelines.

3 Review of Jashore Contract

The following table provides detailed comments regarding the current PPP contract for the Jashore Municipality. The table covers twenty-five crucial aspects that should be included in a standard PPP contract and compares the current Jashore Municipality contract in these twenty-five essential aspects. Subsequently, the table also provides recommendations that should be implemented in any future PPP contract for Jashore Municipality.

SI	Name of the Topic	Existing Provision	Recommendations for Improvement
1.	The preamble of the agreement.	The preamble of the agreement. has not been included in the current contract	Preamble section needs to be included in the contract to have the information in a structured manner. In a PPP contract, it is recommended to cover the preamble of the agreement.
2.	Definitions and interpretations.	The definitions and interpretations have not been included in the current contract	In a PPP contract, definitions should be provided. Unless the essential terms are clearly defined, it is very difficult to interpret the contract properly
3.	Concession.	The existing contract provides some general guideline regarding the role of concessionaire and contracting authority.	The contract needs to structure precisely to define the obligations of the parties during the contract period. It is essential to provide a detailed description of lessor and lessee's project responsibility. For instance, in the contract, it has been mentioned that the infrastructure and equipment returned will be inspected to ensure only reasonable wear and tear that has changed the condition. However, it has not been said who will conduct this inspection. Usually, in the PPP project, there should be a specific handover clause and an independent engineer to inspect the project asset during project handover.
4.	Project Site.	The existing contract does not define the project site. It doesn't include any map, coordinates of the land and other details.	In a PPP agreement, the project site should be clearly defined. Consent /approval from DOE needs to incorporated. Authority's role in securing license and permits needs to be stipulated.
5.	Independent Engineer and other third parties such as insurer and escrow agent.	In the current contract, there are no specific clauses related to Independent Engineer and other third parties such as insurer and escrow agent.	In a PPP contract, it is recommended to include the role of other third parties such as insurer.
6.	Engagement of sub-contractors.	In the current contract, there are no specific clauses	It is essential to specify the role of sub-contractors.

SI	Name of the Topic	Existing Provision	Recommendations for Improvement
		related to Engagement of sub-contractors.	
7.	Concessionaire's/private company's obligations.	The current contract provides some general guideline regarding the role of the concessionaire	It is essential to give a detailed description of the role of the concessionaire. For instance, it is crucial to specify the types of insurance required for the project and who will fulfil the payment obligations of the insurance company. It is also essential to define the KPIs applicable for the concessionaire and relevant penalty mechanism for any non-compliance of KPIs.
8.	Design construction and maintenance of facility.	The current contract KPIs related to maintenance has not been specified.	The design construction part is not applicable for this contract. It is necessary to provide a detailed description of the maintenance KPIs.
9.	Government Agency's obligations.	The current contract provides some general guideline regarding the role of Government Agency	It is necessary to provide a detailed description of the role of the Government Agency. It is essential to cover the tariff review process for this project and the role of government in the tariff review process. In addition, how the government will monitor the KPIs related to FSM have not been specified in the contract.
10.	Change of scope.	The current contract has not specified the change of scope clause	In a PPP contract, it is recommended to define the possible modifications of scope
11.	Payments and financial matters.	The current contract provides a guideline regarding the provision of types and period of payments, the procedure for payment, and calculation of the amount of payment, payment adjustment, bonus and reduction in payment, security. However, the contract does not include any clauses related to supervision charges of the implementing authority, monitoring expenses, and insurance.	It is necessary to include clauses related to supervision charges of the implementing authority, monitoring expenses, and insurance.
12.	Tariff, fees, levy and their collection and appropriation.	The current contract provides a guideline regarding tariff structure and amount. However, the agreement does not include any clauses reviewing of the	In a PPP contract, it is recommended to include provisions related to reviewing of the tariff, tariff adjustment, and cost of tariff review.

SI	Name of the Topic	Existing Provision	Recommendations for Improvement
		tariff, tariff adjustment, cost of tariff review	
13.	Capacity augmentation.	The current contract has not specified the clauses related to Capacity augmentation.	Clauses related to Capacity augmentation should be included in the contract
14.	Waste treatment and disposal.	The current contract provides a guideline regarding methods of collection, transportation, treatment and final disposal. However, the contract does not include chemical and biological characteristics of the wastes at final disposal. These characteristics should be the KPI of the contract	It is essential to define the KPIs clearly
15.	Change in law.	The current contract has not specified the Change in law clause.	It is necessary to define the Change in law
16.	Force majeure.	The current contract has not specified the Force majeure clause.	In a PPP contract, it is recommended to define force majeure events (political and non-political), the obligation of parties, allocation of costs, compensation to the concessionaire, termination of contract due to force majeure, payments due to force majeure termination.
17.	(Normal) Termination of contract.	The agreement will automatically be renewed unless revised by both parties and agreed by the Steering Committee. If the contract is not renewed, then it is essential to specify the basis for calculating compensation for assets not fully amortised or depreciated and related matters. In the PPP contract, these issues have not been clearly specified. Besides, it has not been specified how the steering committee will be formed.	It is essential to specify the basis for calculating compensation for assets not fully amortized or depreciated and related matters. Besides, it is necessary to specify the formation procedure of the steering committee clearly
18.	Events of default and termination.	The agreement specifies that either party reserve to terminate the contract provided a six-month prior written notice. Such clauses can significantly increase the project risk and discourage private sector participation in the project.	In a PPP contract, it is recommended to specify concessionaire event of default, agency event of default, termination due to concessionaires or agency events of default, obligations and rights of parties, termination procedure and payments and claim on assets.

SI	Name of the Topic	Existing Provision	Recommendations for Improvement
19.	Mode of payment by agency or vice versa.	The current contract has specified the Mode of payment by agency or vice versa.	
20.	Handover of project facility.	In the contract, it has been specified that the infrastructure and equipment returned will be inspected to ensure only reasonable wear and tear that has changed the condition. However, it has not been mentioned who will conduct this inspection.	Usually, in the PPP project, there should be a specific handover clause and an independent engineer to inspect the project asset during project handover.
21.	Independent auditor.	The current contract has specified the clauses related to Independent auditor	In a PPP agreement, it is recommended to specify the provisions associated with the independent auditor. The contract needs to specify general requirements and eligibility, the procedure of appointment, obligations of the auditor and payment of fees.
22.	Applicable law and dispute resolution.	In the contract, it has been specified that an attempt shall be made by both parties to amicably resolve disputes that may arise during the agreement period through mutual consultations. The Steering Committee could also be involved in supporting mediation efforts between the two parties.	In a PPP contract, it is necessary to specify the applicable laws, methods of dispute resolution to be used (conciliation, arbitration) and their procedure, obligations and rights of parties. Without such clauses, the private partner's project risk can significantly increase and potentially can discourage private sector participation in the project.
23.	Representations and warranties, disclaimer.	The current contract has not specified the clauses related to Representations and warranties, disclaimer clause.	In a PPP contract, it is essential to specify the clauses related to representations and warranties, disclaimer.
24.	Miscellaneous.	The current contract has not specified the clauses related to liability and indemnity, amendment, governing laws and jurisdiction, waiver, counterparts.	In a PPP agreement, it is recommended to specify the clauses related to liability and indemnity, amendment, governing laws and jurisdiction, waiver, counterparts
25.	Annexes or schedules. Description of each schedules on various items (I, II III, etc.) as referred to in the main text are mentioned in this section.	Annexes or schedules have not been provided.	If we receive the Annexes or schedules, then it will be possible to provide more detailed comments.

4 Review of Kushtia Contract

In order to operate Faecal Sludge Treatment Plant (FSTP) and Compost plant by the private sector at Baradi Kushtia a contract has been signed between Kushtia Pauroshava and Environmental Resource Advancement Services (ERAS). The Contract is indeed a Lease as well as O&M agreement. In the signed contract, some broad and important parameters have been covered that needs to be specific and restructured. Besides some missing provisions/parameters needs to be incorporated, which are briefly described in the table below:

	Name of the Topic	Existing Provision	Recommendations for Improvement
1.	Preamble of the agreement.	The section preamble is missing. The contract includes information of preamble like the parties in the agreement, objective and description of the project, date and place of the agreement. But context and reference to legal empowerment of the authority to execute the agreement are absent.	Preamble section needs to be included in the contract to have the information in a structured manner. This section needs to include the purpose of the agreement, context and reference to legal empowerment of the authority to execute the agreement, objectives and description of the project, language and number of original copies of the agreement, date of effect, date and place of agreement, and other related matters.
2.	Definitions and interpretations.	The Definitions and interpretations section is missing in the contract	Definition and interpretations section is to be included in the contract to have a clear understanding of the contract terms and condition. It may also define what would prevail if any discrepancies or ambiguities in the text of the agreement are observed.
3.	Concession.	Rights, privileges and obligations of the concessionaire/project company are present in the contract but what would have to be done by the private company at the end of the contract period, for example transfer of the assets to the government and their conditions of workability is not mentioned	The contract needs to structure precisely to define the obligations of the parties during the contract period and at the end of the project and section outlines authorization of activities granted to the concessionaire or the project company.
4.	Project Site.	Location of the project site, use and handover of the project site, possession and maintenance of the site are present. But consent /approval from DOE is not clearly mentioned. Authority's	Consent /approval from DOE needs to incorporated. Authority's role in securing license and permits needs to be stipulated.

	Name of the Topic	Existing Provision	Recommendations for Improvement
		role in securing license and permits is absent.	
5.	Independent Engineer and other third parties such as insurer and escrow agent.	Not applicable.	Not applicable
6.	Concessionaire's/private company's obligations.	Concessionaire's/private company's obligations are included in the contract but information disclosure, public information, financing arrangement, refinancing, use of insurance proceeds, performance security, are absent in the contract.	Information disclosure, public information, performance security, uninsurable risks information disclosure requirement and reporting to regulatory bodies need precisely to be defined in the contract.
7.	Operation and maintenance of facility.	Methods of collection, transportation, treatment and final disposal, operation period, performance monitoring are mentioned in the contract, but physical, chemical and biological characteristics of the wastes at final disposal, recycling of treated waste material breach of operation and maintenance is absent.	This section needs to includes physical, chemical and biological characteristics of the wastes at final disposal, recycling of treated waste material breach of operation and maintenance, incidence management, network connectivity and access to the facility by other operators/ agencies, material breach of operation and maintenance, performance measures (quality and quantity of project outputs,), performance monitoring, information disclosure, insurance etc.
8.	Government Agency's obligations.	General obligation of the contracting authority is identified in the contract but establishment of a tariff review process, government incentives that may be applicable, handing over the project site and other areas in which the concessionaire/project company may expect support from the government and the conditions of such support , the obligations of the government if any are absent	Establishment of a tariff review process, government incentives that may be applicable, handing over the project site and other areas in which the concessionaire/project company may expect support from the government and the conditions of such support , the obligations of the government if any are absent need to be included in the contract.
9.	Change of scope.	The section is missing	The section defining necessity of changes, admissible changes the

	Name of the Topic	Existing Provision	Recommendations for Improvement
			defined procedure for making such changes need to be incorporated
10.	Payments and financial matters.	Payment adjustment is absent	This section defining provision of types and period of payments, the procedure for payment, calculation of the amount of payment, payment adjustment, bonus and reduction in payment, VAT and other taxes, performance security, insurance need to be incorporated
11.	Tariff, fees, and their collection and appropriation	The contract mentioned a fixed amount of payment by the private party to the Contracting Authority	This section including the government agency's rights, concessionaire's obligation, tariff structure and amount, exemption and discrimination, subsidization/cross-subsidization, tariff review process and mechanism, collection and payment/transfer mechanism, accounting standards, information on cost of operation need to be addressed. ,
12.	Force majeure.	The section is missing.	The section incorporating force majeure events (political and non-political), the obligation of parties, allocation of costs, compensation to the concessionaire, termination of contract due to force majeure, payments due to force majeure termination
13.	(Normal) Termination of contract.	The contract includes possibility of renewal but the basis for calculating compensation for assets not fully amortized or depreciated and related matters is absent.	Termination of contract needs to include the transition arrangements when a new operator takes over, the basis for calculating compensation for assets not fully amortized or depreciated and related matters
14.	Events of default and termination.	The section is missing.	The section needs to be stipulate concessionaire event of default, termination due to concessionaires or agency events of default, obligations and rights of parties, termination procedure and payments and claim on assets
15.	Handover of project facility.	Time of handover and obligations of the private party are present in the contract.	The section needs to include Time of handover, obligations of the concessionaire, defect liability, the procedure of handover
16.	Independent auditor.	The section is missing.	This section needs to include general requirements and eligibility, the procedure of appointment,

	Name of the Topic	Existing Provision	Recommendations for Improvement
			obligations of the auditor and payment of fees.
17.	Applicable law and dispute resolution.	Methods of dispute resolution to be used and their procedure are present but obligations and rights of parties along with applicable law are missing.	Applicable Law needs to be included.
18.	Representations and warranties, disclaimer.	The section is missing.	The section needs to include representations and warranties of the concessionaire and the government agency, obligations to notify any change to the other party are covered in this section.

5 Review of Jhenaidah Contract

The following table provides detailed comments regarding the current PPP contract for the Jhenaidah Municipality. The table covers twenty-five crucial aspects that should be included in a standard PPP contract and compares the current Jhenaidah Municipality contract in these twenty-five essential aspects. Subsequently, the table also provides recommendations that should be implemented in any future PPP contract for Jhenaidah Municipality.

	Name of the Topic	Existing Provision	Recommendations for Improvement
1.	The preamble of the agreement.	The preamble of the agreement. has not been included in the current contract	In a PPP contract, it is recommended to cover the preamble of the agreement. Preamble section can provide information in a structured manner.
2.	Definitions and interpretations.	The definitions and interpretations have not been included in the current contract	In a PPP agreement, definitions should be provided. Unless the essential terms are clearly defined, it is very difficult to interpret the contract properly
3.	Concession.	The existing contract provides some general guideline regarding the role of concessionaire and contracting authority.	It is essential to provide a detailed description of JPS and AID Foundation's project responsibility. For instance, in the contract, it has been mentioned that AID will periodically conduct a water quality test. However, the agreed parameter for this test has not been specified in the contract. Besides, along with treated water, there should be specific KPI for treated bio-solids. However, the current contract does not include any KPI of treated FS (Bio-solid)
4.	Project Site.	The existing contract does not define the project site. It doesn't include any map, coordinates of the land and other details.	In a PPP contract, the project site should be clearly defined. Consent /approval from DOE needs to incorporated. Authority's role in securing license and permits needs to be stipulated.
5.	Independent Engineer and other third parties such as insurer and escrow agent.	In the current contract, there are no specific clauses related to Independent Engineer and other third parties such as insurer and escrow agent.	It is recommended to include clauses related third parties such as insurer in the PPP agreement.
6.	Engagement of sub-contractors.	In the current contract, there are no specific clauses related to Engagement of sub-contractors.	It is recommended to specify the role of sub-contractors in the PPP agreement
7.	Concessionaire's/private company's obligations.	The current contract provides some general guideline regarding the role of the concessionaire	It is essential to give a detailed description of the role of the concessionaire. For instance, it is crucial to specify the types of insurance required for the project

	Name of the Topic	Existing Provision	Recommendations for Improvement
			and who will fulfil the payment obligations of the insurance company. It is also essential to define the KPIs applicable for treated bio-solids and water and relevant penalty mechanism for any non-compliance of KPIs.
8.	Design construction and maintenance of facility.	The current contract KPIs related to maintenance has not been specified.	Design construction is not applicable for this agreement. However, it is essential to provide a detailed description of the maintenance KPIs.
9.	Government Agency's obligations.	The current contract provides some general guideline regarding the role of Government Agency	It is essential to provide a detailed description of the role of the Government Agency. For instance, how the government will monitor the KPIs related to FSM have not been specified in the contract
10	Change of scope.	The current contract has not specified the change of scope clause	In a PPP contract, it is recommended to define the possible modifications of scope
11	Payments and financial matters.	The current contract provides a guideline regarding the provision of types and period of payments, the procedure for payment, calculation of the amount of payment. However, the contract does not include any clauses related to supervision charges of the implementing authority, monitoring expenses, and insurance.	In a PPP agreement, it is recommended to include clauses related to supervision charges of the implementing authority, monitoring expenses, and insurance. Relevant clauses related to VAT, taxes, performance security, insurance need to be incorporated
12	Tariff, fees, levy and their collection and appropriation.	The current contract provides a guideline regarding tariff structure and amount. However, the agreement does not that will be tariff collected from the households.	In a PPP contract, it is essential to include provisions related to reviewing of the tariff, tariff adjustment, and cost of tariff review.
13	Capacity augmentation.	The current contract provides some guideline regarding capacity augmentation.	It is essential to provide a detailed description of Capacity augmentation. For instance, it is important to specify the applicable provisions if AID foundation wants to use other alternative technologies.
14	Waste treatment and disposal.	The current contract provides a guideline regarding methods of collection,	In a PPP agreement, it is recommended to define the KPIs clearly

	Name of the Topic	Existing Provision	Recommendations for Improvement
		transportation, treatment and final disposal. However, the agreement does not include chemical and biological characteristics of the wastes at final disposal. These characteristics should be the KPI of the contract	
15	Change in law.	The current contract has not specified the Change in law clause.	In a PPP contract, it is recommended to define the Change in law
16	Force majeure.	The current contract has not specified the Force majeure clause.	It is recommended to define clauses related to force majeure events (political and non-political), obligation of parties, allocation of costs, compensation to concessionaire, termination of contract due to force majeure, payments due to force majeure termination.
17	(Normal) Termination of contract.	The contract mentions that after three years, the PPP contract can be extended depending on the satisfactory performance of the AID Foundation. If the contract is not renewed, then it is essential to specify the basis for calculating compensation for assets not fully amortised or depreciated and related matters. In the PPP contract, these issues have not been clearly specified.	It is essential to specify the basis for calculating compensation for assets not fully amortized or depreciated and related matters in the PPP agreement
18	Events of default and termination.	The current contract has not specified the Events of default and termination	In a PPP contract, it is essential to specify concessionaire event of default, agency event of default, termination due to concessionaires or agency events of default, obligations and rights of parties, termination procedure and payments and claim on assets.
19	Mode of payment by agency or vice versa.	The current contract has specified the Mode of payment by agency or vice versa.	
20	Handover of project facility.	In the contract, it has been specified that the	Usually, in the PPP project, there should be a specific handover clause

	Name of the Topic	Existing Provision	Recommendations for Improvement
		AID Foundation will be responsible for maintaining the project asset. However, it has not been mentioned how the asset handover process will be conducted after the project period.	and an independent engineer to inspect the project asset during project handover. Also, there should be a provision of a security deposit from the private partner.
21	Independent auditor.	The current contract has specified the clauses related to Independent auditor	In a PPP contract, it is necessary to specify the provisions associated with the independent auditor. There should be separate clauses for auditor's eligibility, procedure of appointment, obligations of the auditor and payment of fees.
22	Applicable law and dispute resolution.	In the contract, it has been specified that in any event of defaults and project dispute, the parties will meet and speak with each other. If it fails, a mutually agreed mediator will be consulted to reach a resolution.	In a PPP agreement, it is essential to specify the applicable laws, methods of dispute resolution to be used and their procedure, obligations and rights of parties. Without such clauses, the private partner's project risk can significantly increase and potentially can discourage private sector participation in the project.
23	Representations and warranties, disclaimer.	The current contract has not specified the clauses related to Representations and warranties, disclaimer clause.	In a PPP contract, it is essential to specify the clauses related to representations and warranties, disclaimer
24	Miscellaneous.	The current contract has not specified the clauses related to liability and indemnity, amendment, governing laws and jurisdiction, waiver, counterparts.	In a PPP agreement, it is recommended to specify the clauses related to liability and indemnity, amendment, governing laws and jurisdiction, waiver, counterparts
25	Annexes or schedules. Description of each schedules on various items (I, II III, etc.) as referred to in the main text are mentioned in this section.	Annexes or schedules have not been provided.	If we receive the Annexes or schedules, then it will be possible to provide more detailed comments.

6 Review of Faridpur Contract

The following table provides detailed comments regarding the current PPP contract for the Faridpur Municipality. The table covers several crucial aspects that should be included in a PPP contract. Subsequently, the table also provides recommendations that should be implemented in any future PPP contract for Faridpur Municipality.

	Name of the Topic	Existing Provision	Recommendations for Improvement
1.	The preamble of the agreement.	Preamble of the agreement has been included in the contract. This section describes the background of the contract, identifies the parties in the agreement and Purpose of the agreement.	This section may also include the following: Context and reference to legal empowerment of the authority to execute the agreement, Objectives and description of the project, language of the agreement, date of effect, the date and place of agreement.
2.	Definitions and interpretations.	A definition and interpretation section is included in the contract.	The contract should include operational definitions and interpretation of terms used in the contract document that requires clear understanding. It may also define what would prevail if any discrepancies or ambiguities in the text of the agreement are observed.
3.	Concession.	The existing contract provides some general guideline regarding the role of concessionaire and contracting authority.	The contract should outline the following: authorization of activities granted to the project company; Rights and obligations of the concessionaire/project company; Contract period and extension of the contract. What would have to be done by the private company at the end of the contract period, for example, transfer of the assets to the government.
4.	Project Site.	The existing contract does not define the project site, use right, allowed use of the project site, possession and handover of the project site etc.	location of the project site, Use rights, title and permitted use of the project site, handover of the project site, possession of the site, maintenance of the site, applicable licenses and permits that the private company need to collect from concerned authorities. If the contracting agency would have any role in securing those licenses and permits.
5.	Independent Engineer and other third parties such as insurer.	Independent engineer is not applicable for this contract since there is no construction works involved. There are no provisions for insurance in the contract.	If construction works are involved in the contract, a provision for independent engineer should be included defining the procedure for the appointment. Contract should include information related to insurer.

	Name of the Topic	Existing Provision	Recommendations for Improvement
6.	Concessionaire's/ private company's obligations.	The current contract provides some general guideline regarding the role of the concessionaire	It is essential to give a detailed description of the role of the concessionaire. The contract should specify the types of insurance required for the project and who will fulfil the payment obligations of the insurance company. It is also essential to define the KPIs applicable for treated bio-solids and water and relevant penalty mechanism for any non-compliance of KPIs. The contract should have a provision for performance security
7.	Operation and maintenance of facility.	The current contract provides some general guideline regarding the Operation and maintenance of facility	The contract should clearly mention methods of collection, transportation, treatment and final disposal; physical, chemical and biological characteristics of the wastes at final disposal; Recycling of treated waste. Procedure for temporary closure for repair and maintenance, access to the facility by other operators/agencies, material breach of operation and maintenance, performance measures (quality and quantity of project outputs), performance monitoring procedure,
8.	Government Agency's obligations.	The current contract provides some general guideline regarding Government Agency's obligations mostly related reporting requirement by the operator.	The contract should describe the Government Agency 's obligation related to handing over the project site to the project company Areas in which the project company may expect support from the government and the conditions of such support. The contract should clearly mention how tariff will be reviewed, Under what circumstances government incentives will be applicable and how it will be disbursed.
9.	Change of scope.	The current contract has not specified the change of scope clause	In a PPP contract, it is recommended to define the possible modifications of scope
10.	Payments and financial matters.	There are no clear payment provisions in the contract.	The contract should mention how the amount of payment will be calculated, period of payments, provision for bonus and reduction in payment, VAT and other taxes,

	Name of the Topic	Existing Provision	Recommendations for Improvement
11.	Tariff, fees, and their collection and appropriation	There are no clear provision for Tariff, fees, and their collection and appropriation	The contract should have the tariff structure and amount, exemption and discrimination, subsidization, process and mechanism, collection and payment/transfer mechanism.
12.	Force majeure.	There are no provision for Force majeure in the contract	The contract shall mention the events of Force majeure the obligation of parties under Force majeure, allocation of costs to be borne by the parties in the event of Force majeure,compensation to the concessionaire, termination of contract due to force majeure Payments due to such termination.
13.	(Normal) Termination of contract.	There are no provisions for termination in the contract.	The contract should mention the circumstances under which contract can be terminated Compensations in the event of termination and the basis for calculating compensation for assets not fully amortized or depreciated and related matters.
14.	Events of default and termination.	There are no provision related to events of default and termination	The contract should specify concessionaire event of default, agency event of default, termination due to concessionaires or agency events of default, obligations and rights of parties, termination procedure and payments and claim on assets.
15.	Handover of the project facility.	No provision related to handover of project facility	Usually, in the PPP project, there should be a specific handover clause and an independent engineer to inspect the project asset during project handover. Also, there should be a provision of a security deposit from the private partner.
16.	Independent auditor.	No provision related to the independent auditor	In a PPP contract, it is recommended to specify the provisions associated with the independent auditor
17.	Applicable law and dispute resolution.	The current contract has not specified the clauses related to Applicable law and dispute resolution.	In a PPP contract, it is recommended to specify the applicable laws, methods of dispute resolution to be used and their procedure, obligations and rights of parties. Without such clauses, the private partner’s project risk can significantly increase and potentially can discourage private sector participation in the project.
18.	Representations and warranties, disclaimer.	The current contract has not specified the clauses related to Representations and warranties, disclaimer clause.	In a PPP contract, it is recommended to specify the clauses related to representations and warranties, disclaimer

7 Summary of City Specific Workshops

As part of the project, the consultant team conducted four city-specific workshops with municipality officials and private investors. Following the request of SNV, Bangladesh, the proposed workshop with Khulna City Corporation was cancelled. Because of the Covid-19 pandemic, all the workshops were conducted online. During these workshops, the consultant team carried out detailed discussions with the active participation of municipality officials, potential private investors and SNV. The findings of each of these workshops are discussed below:

7.1 City Specific Workshop with the Officials of Kushtia Municipality

On 25 August 2020, IIFC conducted the city-specific workshop with the officials of Kushtia Municipality. Currently, Kushtia municipality has an operational FSM contract with the Environmental Resource Advancement Services (ERAS) for operating Faecal Sludge Treatment Plant (FSTP) and Compost plant. As part of SNV's "Enhancing capacity of LGIs to address PPP contracts for FSM services" project, IIFC conducted the Kushtia Municipality workshop, which was divided into three separate sessions.

In Session One, the IIFC team conducted a project background analysis and brainstorming session. In the project background part, the municipality officials shared their FSM project experience. Subsequently, the IIFC team conducted a brainstorming session with the workshop participants. During the brainstorming session, the workshop participants provided different important project insights. The municipality officials reported that currently, the municipality is collecting only 2% of the FS generated in the municipality area. IIFC team informed the participants that for fulfilling the targets of SDG, it is essential to increase this FS generation and reach 100% FS collection by 2030.

In session two, the IIFC team shared their study findings with the municipality officials. As part of SNV's "Enhancing capacity of LGIs to address PPP contracts for FSM services" project, IIFC team reviewed the existing contract between Kushtia municipality and Environmental Resource Advancement Services (ERAS) for operating Faecal Sludge Treatment Plant (FSTP) and Compost plant. While this contract is one of the pioneer contracts for promoting private sector participation in the FSM sector, IIFC team presented seventeen suggestions to the Kushtia Municipality.

In session three, IIFC team provided their study observations and possible areas of Improvement for Kushtia municipality. IIFC team briefed the municipality officials regarding different FSM concepts including block scheduled desludging and introducing KPIs for ensuring 100% FS collection.

On 25 August 2020, IIFC also conducted a separate investor workshop with the officials of ERAS. Currently, Kushtia municipality has an operational contract with the Environmental Resource Advancement Services (ERAS) for operating Faecal Sludge Treatment Plant (FSTP) and Compost plant. During the workshop, ERAS highlighted their project experience and showed their interest in their project contract extension. ERAS also showed their interest in expanding their capacity and asked for the municipality's assistance in this process.

7.2 City Specific Workshop with the Officials of Benapole Municipality

On 04 November 2020, IIFC conducted the city-specific workshop with the officials of Benapole. Compared to other municipalities, Benapole is a relatively new municipality and currently planning to improve its FSM service delivery. As part of SNV's "Enhancing capacity of LGIs to address PPP contracts for FSM services" project, IIFC conducted the Benapole Municipality workshop, which was divided into two separate sessions.

In Session one, The IIFC team conducted a brainstorming session. Initially, the IIFC team shared their FSM project experience with the officials of Benapole municipality. Subsequently, the IIFC team conducted a brainstorming session with the Benapole municipality officials. During the brainstorming session, the workshop participants mentioned that currently, they do not have a well-equipped FSM system and requires more FSM Infrastructure. Without required infrastructure, the municipality cannot regularly collect the FS generated in the municipality area.

In session two, the IIFC team shared their study findings with the municipality officials. IIFC team briefed the municipality officials regarding different major FSM concepts including stages of the FSM value chain, block scheduled desludging, and providing KPIs for ensuring 100% FS collection.

7.3 City Specific Workshop with the Officials of Jhenaidah Municipality and AID Foundation

On 14 October 2020, IIFC conducted the city-specific workshop with the officials of Jhenaidah Municipality and AID Foundation. Currently, Jhenaidah municipality has an operational FSM contract with AID Foundation. Soon this operational contract will end, and now, Jhenaidah municipality is exploring the possible future contract options. As part of SNV's "Enhancing capacity of LGIs to address PPP contracts for FSM services" project, IIFC conducted the Jhenaidah Municipality workshop, which was divided into three separate sessions.

In Session one, The IIFC team conducted a project background analysis and brainstorming session. In the project background part, the municipality officials shared their FSM project experience. The municipality officials mentioned that they need more vacutugs and land for project expansion. They are also worried about the future capacity of the private partner and feels that for future the municipality will require a carefully drafted contract. Through a carefully prepared agreement, the municipality will be able to expand its FSM service capacity and ensure required FS collection.

In session two, the IIFC team shared their study findings with the municipality and AID Foundation officials. As part of SNV's "Enhancing capacity of LGIs to address PPP contracts for FSM services" project, the IIFC team reviewed the existing contract between Jhenaidah municipality and AID Foundation. Based on detailed contract review, IIFC team provided seventeen suggestions.

Finally, in session three, IIFC team provided their study observations and possible areas of Improvement for Jhenaidah municipality. The municipality officials also informed the IIFC team that they are interested in increasing the present FSM capacity. They also showed their willingness to improve the contractual provisions of their future FSM PPP project.

7.4 City Specific Workshop with the Officials of Jashore Municipality

As IIFC team was conducting a separate PPP transaction assignment at the same time with Jashore municipality, the format of the proposed workshop with Jashore municipality under "Enhancing capacity of LGIs to address PPP contracts for FSM services" project was changed. Instead, IIFC team had an introductory discussion with the Jashore municipality officials concerning their PPP project transaction assignment. During the introductory discussion IIFC team briefed the municipality officials regarding their phase one project and explained major FSM PPP concepts. The Jashore municipality officials shared their project experience with IIFC officials and highlighted their expectation for the future PPP project.

8 Conclusions

The city-specific workshops were conducted with the active participation of the concerned municipality officials and SNV. These workshops provided important guidance regarding the future course of actions for promoting PPP projects in the FSM industry. Along with the concerned municipality officials, private partners also participated in some of the workshops. The private partners showed their interest in this sector, which is an encouraging sign for other potential investors. ERAS showed their active interest in expanding the project capacity and asked for the municipality's assistance in this process.

For addressing the second-generation sanitation challenge, PPP can play an important role. Appropriate and adequate management of FSM PPP project is imperative for the protection of human and environmental health. However, currently municipalities do not have any capacity building initiatives to train its officials regarding PPP project development and management. Considering this issue, it is essential to regularly arrange PPP training programs for different departments of LGIs.

The above training can focus on two key areas (a) PPP generic processes, and (b) major concepts for PPP in the FSM sector. While the former is the same for all sectors and is hence fairly well understood, the latter is very much new and many of the major concepts for PPP in the FSM sector will evolve over time.

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