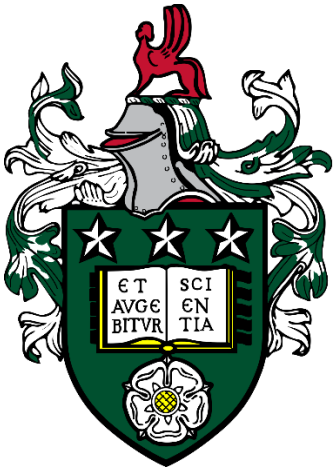

The Political Economy of Sanitation

An Exploratory Study of Stakeholder Incentives in Delivering Sanitation

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“My Lord, enable me to be grateful for your favour which you have bestowed upon me and upon my parents and to do righteousness of which you approve. And admit me by your mercy into [the ranks of] your righteous servants” [Surah An-Naml: 19]

To Wafaa, my sister-mum, thanks for believing in me!

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Finally, I dedicate this work to our late colleague Dr Fiona Zakaria, who passed away weeks before submitting my PhD in Leeds, and to my late parents; your memory will always warm my heart!

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List of Abbreviations

ACF	Action Against Hunger
ADB	Asian Development Bank
AIDA	The Association of International Development Agencies
ANC	The African National Congress
ANCYL	The African National Congress Youth League
BARI	Bangladesh Agricultural Research Institute
BDT	Bangladesh Taka
CBOs	Community-based organisations
CBSA	Container-based Sanitation Alliance
C&T	Collection and Transport
CMWU	Coastal Municipalities Water Utility
USD	The United States Dollar
CoCT	City of Cape Town
COVID-19	Coronavirus Disease 2019
DA	The Democratic Alliance
DPHE	Department of Public Health Engineering ()
EPWP	Expanded Public Works Programme
EU	European Union
FFT	Full-flush Toilet
FL	Fresh Life
FLTs	Fresh Life Toilets
FS	Faecal Sludge
FS/WW	Faecal Sludge and Wastewater
FSM	Faecal Sludge Management
GB	Great Britain
GDP	Gross Domestic Product
GLAAS	The Global Analysis and Assessment of Sanitation and Drinking-Water
GoB	Government of Bangladesh
GoI	Government of Israel
GPS	Global Positioning System
GVC	Gruppo di Volontariato Civile

HHs	Households
INGOs	International non-government organisations
IRF	Institutional Regulatory Framework
ISD	Informal Service Department
ITN-BUET	International Training Network of Bangladesh - Bangladesh University of Engineering and Technology
JMP	Joint Monitoring Programme
LISs	low-income settlements
LMICs	Low and middle-income countries
MDGs	The Millennium Development Goals
MIG	Municipal Infrastructure Grant
MoLG	Ministry of Local Government
MOU	Memorandum of Understanding
MoWS	Ministry of Water and Sanitation
NCC	Nairobi City County
NCWSC	Nairobi City Water and Sewerage Company
NEMA	National Environment Management Authority
NGEST	the North Gaza Emergency Sewerage Treatment Plant
NGOs	Non-governmental Organisations
OD	Open Defection
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
PA	The Palestinian Authority
PE	Political Economy
PEA	Political Economy Analysis
PFT	Portable Flush Toilet
PLO	The Palestinian Liberation Organisation
PPP	Public-Private Partnerships
PWA	The Palestinian Water Authority
RBF	Result-Based Financing
SDGs	Sustainable Development Goals
SNV	Stichting Nederlandse Vrijwilligers (Foundation of Netherlands Volunteers)
SVC	Sanitation Value Chain

UK	United Kingdom
UN	United Nations
UNDP	United Nations Development Program
UNICEF	The United Nations Children's Fund
UNRWA	United Nations Relief and Works Agency for Palestine Refugees in the Near East
USAID	The United States Aid International Development
USD	United States Dollar
WHO	World Health Organisation
WASH	Water, Sanitation and Hygiene
WSISU	Water and Sanitation Informal Settlement Unit
WSUP	Water & Sanitation for the Urban Poor
WatSan	Water and Sanitation
WTP	Willingness To Pay
WW	Wastewater
WWTPs	Wastewater Treatment Plants
VAT	Value-added Tax

Abstract

Despite continued funding to increase access to safely-managed sanitation, progress is still lagging, especially within urban low-income communities. Mismatch of sanitation stakeholders' incentives and bias in allocating funds toward the various sanitation services is a crucial barrier to sustainable and effective provision. This PhD thesis explores the incentives of sanitation stakeholders to allocate funds across the sanitation value chain (SVC). By building on political economy and institutional economics, the research explores how economic characteristics of sanitation interact with various views about the responsibility to fund sanitation. I use four qualitative case studies purposefully selected to investigate various service delivery arrangements within a variety of development contexts.

Since large infrastructure receives substantial investments in the development sector, the first case analyses how incentives influenced the functionality of faecal sludge treatment plants in four small towns in Bangladesh. The case finds stakeholders' lack of incentives toward less visible services, such as faecal sludge collection and transport, a barrier to sustainable service provision. The findings of this work led me to develop a more systematic approach to investigating incentives toward funding and providing each service along the SVC in the subsequent case studies.

Since the development sector increasingly advocates for market-based sanitation, the second case examines the operations of Sanergy, a private provider of container-based sanitation in low-income settlements (LISs) in Nairobi, Kenya. The case sheds light on the mismatch of incentives of foreign services providers backed by philanthropist donors, the served population and governmental organisations. In addition, the role of the state in providing or supporting the private sector to provide sanitation is non-existent, potentially due to the lack of accountability to citizens and their inability to demand and advocate for their fundamental right to sanitation.

The third case study investigates the public provision of sanitation in LISs in Cape Town, South Africa; it provides an opposite narrative of Kenya. For South Africans, dignified sanitation is a basic right the state must stipulate for all. Community-based organisations and local leaders have mobilised collective action for the state to provide public toilets, often of temporary nature, free of charge in LISs. However, such efforts do not extend to safe faecal sludge collection, transport, and treatment, undermining the sustainability of the offered services.

External donors are not central in the first three cases. Therefore, the Gaza Strip, Palestine, was selected to explore how the incentives of various stakeholders, including external donors, play out in a fragile and donor-dependent context. Despite the limited domestic financial resources,

external donors prioritise the capital costs of large new infrastructure - the downstream of the SVC (wastewater treatment) leaving behind unmet rehabilitation and operation needs to maintain these infrastructure and other upstream service in the SVC. Besides, donors' selectivity in allocating funds undermines the recipient's country autonomy and ownership of the provided services.

I propose an extended political economy analysis (PEA) to understand the issue of stakeholders' incentives in promoting equitable and sustainable sanitation services. This analysis creates a space to appreciate the complex nature of delivering sanitation services. It builds on institutional economics concepts to offer nuance investigation of the unique economic characteristics of sanitation and its impact on the incentives and views of stakeholders about the responsibility to fund and provide it. I do so by utilising the services characteristics framework developed by Batley and McLoughlin, which categorise service characteristics into: nature of good, market-related, task-related and demand-related characteristics.

As sanitation entails heterogonous services, this study systematically analyses each segment of the SVC separately. For instance, excludability – the ability to deny non-payers from accessing a good or a service, and rivalry – when the consumption of a service by one individual subtracts its consumption from others (Cornes and Sandler, 1986), put sanitation on a spectrum of public and private goods. The nature of good, in turn, detracts or incentivises some stakeholders from using, producing, or providing it. Citizens in the LISs of Cape Town perceive toilets as a public good, taking how sanitation resonates with the country's history of apartheid and colonisation. Citizens are unwilling to contribute and believe the state should provide it as per their constitutional right to free basic sanitation. While the same right is spelt in the constitution of Kenya, the state is not compelled to provide basic sanitation to LISs in Nairobi, where private providers offer a range of services for a fee.

As this study finds that sanitation characteristics are not generalizable and, in turn, are perceived differently among the stakeholders and their context, it is vital to conduct an in-depth analysis of the context and the potential sanitation services to assess the prevailing narratives and incentives of each stakeholder to promote sanitation. Investigating stakeholders' incentives to provide and fund sanitation beyond the 'economic logical choice' is the first step to unfolding and aligning stakeholders' incentives to deliver sustainable and equitable safely-managed services across the SVC.

Key words: Institutional economics, funding gaps, incentives, political economy analysis, public services, sanitation value chain

Chapter One: Introducing the Thesis

1.1 Introduction

Access to water and sanitation (WatSan) is essential to the health, economic growth and wellbeing of society, and both water and sanitation are recognised as basic human rights (United Nations, 2016). However, the provision of WatSan services is often not prioritised by governments, especially in low and middle-income countries (LMICs) (Mumssen, Saltiel and Kingdom, 2018). They are often not a priority compared to electricity, communication, education, or transportation. Some households (HHs), regardless of their income levels, also prioritise investing in electricity and communication rather than WatSan services (Komives, Whittington and Wu, 2001).

Within WatSan, sanitation is even more neglected than water; fewer funds are allocated toward sanitation despite its slow progress compared to water service (WHO, 2017). In 2020, 74% of the world population had access to safely managed water compared to only 54% access to safely managed sanitation (UNICEF/WHO, 2021). Global targets, such as the Sustainable Development Goals, for sanitation are often more ambitious than for water since it is already lagging. It is estimated that in 2015, inadequate sanitation cost the world 222.9 USD billion, a sum of sanitation-related illnesses, mortality losses, and capital resources lost due to poor access to sanitation (LiXil, WaterAid Japan and Oxford Economics, 2016). Often the poorest population in the country have the lowest access to sanitation (Morella, Foster and Banerjee, 2008).

Reluctance to fund sanitation is arguably due to the lower perceived benefits of sanitation compared to the direct instant cultivated benefits of water; investing in sanitation is less beneficial to them in the short run than water (Cairncross *et al*., 2010; Trémolet, 2011). For instance, policymakers in Rwanda categorise water infrastructure as a standalone 'essential infrastructure' with disregard to sanitation and hygiene promotion (Tsinda *et al.*, 2021). Therefore, some governments are unwilling to fund sanitation and remain dependent on external support (Evans, Hutton and Haller, 2004; McGinnis *et al.*, 2017).

Sanitation is unattractive politically since communities often prioritise other services. It is considered a 'taboo' topic in many countries since it is related to people's need to defecate and fewer people are interested in discussing its issues compared to water (Trémolet, 2011). Even when communities and social advocates break the silence, providing a service that is culturally accepted, technically and financially suitable for the context is still a challenge.

Another difference that might have led to the slow progress in sanitation compared to water is its heterogeneous technical and provision requirements. Firstly, the scale of sanitation services varies; toilets are provided at household (HH) or housing block scale, faecal sludge (FS) transport is provided on the neighbourhood, or the city scale and the FS treatment is provided on the scale of multiple cities or localities. Secondly, sanitation is not a standalone service; it is often supplementary to water or housing services. Thirdly, access to sanitation involves a set of providers to deliver it (e.g., mason for the user interface, pit emptiers in case of onsite systems, treatment plant operators), and various users (user of toilet, receiver of the collected faecal matter and even the buyers of the treatment reuse products). Consequently, it is difficult to set up a service that accommodate the varying scales, capacities, and incentives of the involved stakeholders.

Misalignment between the incentives of sanitation stakeholders in addressing sanitation issues is a key barrier to the sustainability and effectiveness of delivering sanitation services. There is often bias toward funding infrastructure such as large treatment plants while leaving essential operational needs and less visible services underfunded (Mumssen, Saltiel and Kingdom, 2018). Therefore, aligning stakeholders' incentives is crucial to ensure effective and equitable use of available funding to achieve safely managed sanitation for all. Ostrom, Schroeder and Wynne suggest that incentives are a product of the prevailing political, institutional and social and economic contexts (1993a). Incentives are also closely related to the service economic and institutional characteristics such as monopoly tendency, externalities and nature of good of the service (Batley and Harris, 2014).

Providing sanitation entails hardware (e.g., infrastructure) and software (e.g., sanitation promotion programmes) components as well as the enabling environment. Spending public funds toward on sanitation is justified by its largely public benefits (Evans, van der Voorden and Peal, 2009). Therefore, this thesis contributes to the debate of the responsibility of funding and providing the services directly related to the hardware components of sanitation. The thesis focuses on contexts of challenging institutional, socio-economic and political contexts from LMICs using the examples from secondary towns in Bangladesh, low-income settlements (LISs) in Kenya and Cape Town, and urban cities in Palestine.

1.2 Research Aim and Questions

This thesis aimed to understand how the institutional and economic characteristics of sanitation services influence the incentives of the stakeholders to fund or provide it. To achieve this aim, the research sought to answer the following questions:

1. What are the incentives associated with allocating funds toward sanitation services?
2. How do stakeholders' incentives interact with the institutional and economic characteristics of sanitation services?
3. To what extent can understanding stakeholders' incentives explain the challenges of delivering sustainable sanitation services?

1.3 Thesis Structure

This thesis is comprised of four stand-alone journal article-style chapters (Chapter four-seven) complemented by four chapters to further engage with the research topic, explain methods and the higher-level implications of the study (Chapter one, two, three and eight), summarised as follows.

Chapter One introduces the thesis, it provides the rationale and focus of the thesis, its aim and research questions and the key definitions adopted throughout.

Chapter Two is a literature review that lays the theoretical framework adopted in this thesis. It assesses how sanitation is defined, the subsequent service provision arrangements, and the incentives of associated stakeholders to fund it. It then identifies the critical funding challenges which arise from the conflicting views of stakeholders and their varied incentives toward sanitation provision.

Chapter Three describes the research design; it reflects on the key methodological issues. It defines the research approach and reports the research procedure for the four case studies. It also reflects on the positionality of the researcher, methodological limitations, and ethical issues.

Chapter Four is a standalone published peer-reviewed journal article that presents the first (formative) case study of the thesis. It discusses the stakeholders' incentive issue in promoting the sustainability of faecal sludge treatment plants in secondary towns in Bangladesh. The article presents a review of sustainability issues in FS/WW treatment infrastructure, research methods of this study, findings, and discussion.

Chapter Five is a standalone paper-style chapter presenting the second case study of Sanergy sanitation services in Nairobi, Kenya. It provides a systematic analysis of the service characteristics and stakeholders' incentives in funding sanitation in this context. It discusses the stakeholders' incentive issue in the context of private sector provision in LISs. The

chapter presents a review of sanitation conditions in the LISs of Nairobi, the research methods of this case study, findings, and discussion.

Chapter Six is a standalone paper-style chapter presenting the third case study of state provision of sanitation services in LISs in Cape Town, South Africa. It provides a systematic analysis of the service characteristics and stakeholders' incentives in funding sanitation. It discusses the stakeholders' incentive issue in the context of state provision in LISs. The chapter presents a historical review of sanitation conditions in the LISs of Cape Town, the research methods of this study, findings, and discussion of the study.

Chapter Seven is a standalone paper-format chapter presenting the fourth case study of external aid involvement in sanitation services in the Gaza Strip, Palestine. It provides a systematic analysis of the service characteristics and stakeholders' incentives in funding sanitation. It discusses the stakeholders' incentive issue in the context of dependency on external aid for providing basic services. The chapter presents the political events that shaped the current delivery of basic services, a review of sanitation conditions in the Gaza Strip, research methods of this case study, findings, and discussion.

Chapter Eight concludes the thesis; it provides the thesis's findings summary, ties the four case studies together, and discusses the high-level challenge in addressing stakeholders' incentives toward providing sustainable and equitable sanitation. It reflects on the methodological contribution of the thesis. It then outlines the policy and practice implications of the thesis.

1.4 Glossary of Definitions

There is a lot of confusion over some terms used in discussing the challenges of providing sanitation services, to avoid that in this thesis, I use the following definitions throughout.

Sanitation broadly entails the collection, transport, treatment, disposal, and reuse of human excreta (faecal waste or black wastewater), grey wastewater and solid waste. The focus of this thesis is on managing human excreta taking its persisting challenges and not to address the other emerging challenges such as climate adaptation and biodiversity loss. I use the term sanitation to refer to 'Basic Sanitation', which is what the United Nations for the International Year of Sanitation Communications Strategy defined as "the *disposal of human excreta to prevent disease and safeguard privacy and dignity*" (Evans, van der Voorden and Peal, 2009, p.6).

Stakeholders is a term encompassing any 'affected parties' in a programme or a service such as end users and funders (Setty et al., 2020). In sanitation, there are several parties either affected or concerned with the service beyond the users and funders of interesting such as: environmental protection, public health, and poverty alleviation. As sanitation involves various service influenced by the socio-economic and political context; the stakeholders are changeable based on the studied sanitation system. In this thesis, stakeholders are the key actors involved in achieving the goal of basic sanitation (see the above definition).

Institutions are the 'rules of game' in a society such as norms and arrangements (informal), in addition to the formal man-made constraints that govern human interactions (Harris, 2013; North 1990).

Services are non-consumable goods, and not produced in a factory. Instead, they require coproduction between the producer and the users (Ostrom and Ostrom, 1980; Joshi and Moore, 2004). For instance, the value from a phone network is only achieved when the phone users subscribe to it, unlike the phone itself, manufactured in a factory and has a functional value without the need for contribution from users. The Cambridge Dictionary define services as *a public need* such as: postal services, transport, and public health services; provided by a government system or private organisation.

Incentive is a stimulus (comprising rewards or punishments) that motives people to pursue something (Ostrom *et al.*, 2002). The key action that requires stakeholders to be incentivised in sanitation services is allocating physical production resources (e.g., money, land, and manpower). In this thesis, I look at stakeholders' incentives not only toward contributing to the physical aspect of production, but also to the soft aspects (e.g., advocacy, and accountability measures) which are vital in expanding and promoting sustainable sanitation services.

Goods (in economics literature) are products, resources, or services that has a utility or benefit to the society. There are various types of goods, depending on the feasibility of excluding other from using it and whether it takes the form of individual or joint use, such as: private goods, public goods, club goods, and common-pool goods.

Chapter Two: Incentives for Investing in Sanitation Services

2.1 Introduction

Research on the incentives of stakeholders to fund sanitation, can take different forms, built on a range of different theoretical and methodological underpinnings. It can involve a process evaluation of the planning and operation of a service, which is the approach I use in Chapter four in my formative case study. Exploring incentives can also be embedded in large-scale behavioural research pilots, institutional analysis, and political economy analysis (PEA). In this thesis, I build on institutional economics concepts to inform an extended approach to PEA focused on understanding the incentives of stakeholders in sanitation, which is the approach I use in Chapter five, six, and seven. This chapter lays the theoretical framework for the research inquiry about incentives. I first introduce the various ways of defining sanitation, including its economic characteristics. This is a vital introduction as ambiguity in how sanitation is defined and perceived contributes to the persisting challenges in the sector. I then summarise the prevailing narratives about the responsibility for funding sanitation, their implications, and discuss how these narratives interact with how sanitation is defined.

The next section discusses how demand for sanitation differs based on context and perceptions about sanitation. The remaining sections explore the incentives of the key stakeholders involved in providing sanitation and how these incentives interact with its service characteristics, which is the approach I am adopting throughout the following inquiries in chapter five, six, seven and the final discussion chapter.

2.2 Defining Sanitation

The sanitation value chain (SVC) describes the flow of human excreta, starting from demand creation, collection, emptying and transport to treatment, reuse or disposal of faeces and urine (Trémolet, 2011). It is used to describe all the technical components needed to deliver a complete sanitation service and it is executed either onsite or offsite as follows (Ibid):

1. **Onsite sanitation**: is also referred to as Faecal Sludge Management (FSM), illustrated in the upper part of Figure 1. For it to be safely managed, the human excreta must be contained and left there (to be treated by natural processes) or stored and partially treated in a pit latrine or a septic tank. The remaining FS is then emptied and transported using a range of manual and mechanical technologies to a site to be treated, and the final product is either reused or disposed of safely. Unsafely managed onsite sanitation can include the overflow of FS or supernatant from its containment or where the removed sludge is dumped in nearby water bodies or lands.

2. **Offsite sanitation:** is also called sewer-based sanitation, illustrated in the lower part of Figure 1. For it to be safely managed, the wastewater (WW) collected from the press-flush toilet is conveyed through a piped network to a transfer station or directly to the central wastewater treatment plant (WWTP) to be treated and prepared to reuse or safely dispose of the final products. Water availability is crucial for this system for the solid parts of the excreta to move through the pipe network, unlike onsite sanitation.

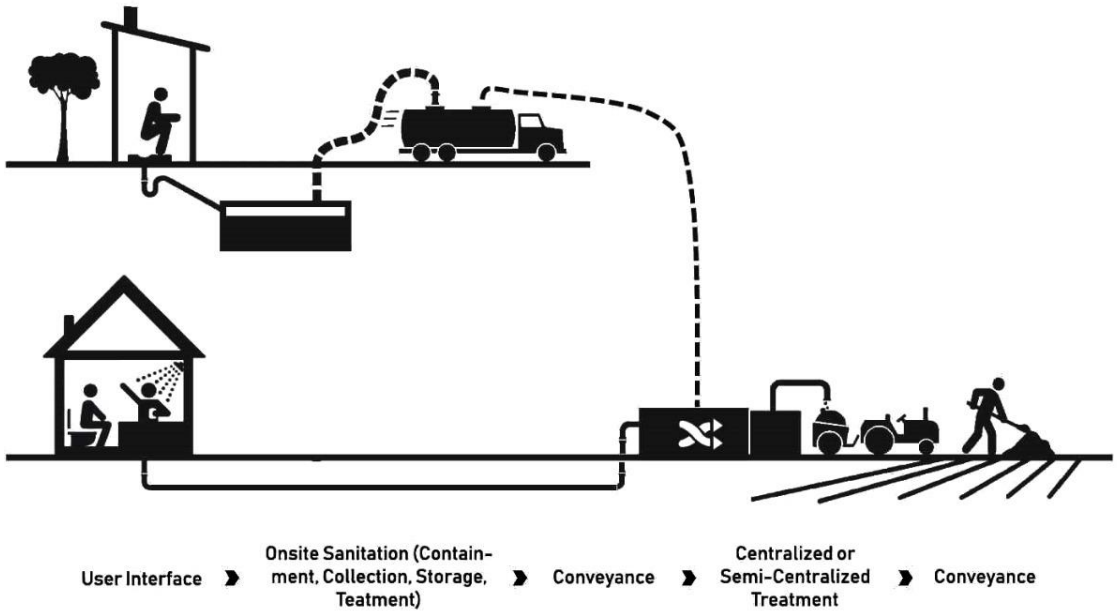

Figure 1: The sanitation value chain shared widely by Bill and Melinda Gates Foundation in 2008 (BMGF, 2012)

As explained in Chapter one, several countries are lagging behind achieving safely managed sanitation. In 2015, the UN General Assembly ratified the 17 Sustainable Development Goals (SDGs) to be achieved by 2030 for the entire world (United Nations, 2019). The SDGs, similar to other international commitments, are aimed at guiding United Nations (UN) member states to prioritise key aspects related to the wellbeing of their nations and aspire to meet specific targets for them. The SDG 6 is about WatSan: "*Ensure availability and sustainable management of water and sanitation for all*". Addressing all segments of the SVC are crucial for achieving this goal, and is highlighted in four of its targets (Ibid):

- SDG 6.2: Realisation of equitable and adequate sanitation and hygiene for all.
- SDG 6.3: Protecting the water quality by the sustainable management of half of the global untreated WW.
- SDGs 6. A: Software support and international cooperation with developing countries in the WASH-related programmes.

- SDG 6. B: Encourage the local communities' involvement in WASH delivery and management.

The UN Joint Monitoring Programme (JMP), a key reporting and monitoring partner of SDG 6.1 and 6.2, has developed the water, sanitation and hygiene ladders shown in Table 1 (WHO/UNICEF, 2017). States would ultimately aspire to achieve universal and equitable access to safe and affordable sanitation, referred to as safely-managed.

Table 1: The sanitation ladder (WHO/UNICEF, 2017)

SERVICE LEVEL	DEFINITION
SAFELY MANAGED	Use of improved facilities that are not shared with other households and where excreta are safely disposed of in situ or transported and treated offsite
BASIC	Use of improved facilities that are not shared with other households
LIMITED	Use of improved facilities shared between two or more households
UNIMPROVED	Use of pit latrines without a slab or platform, hanging latrines or bucket latrines
OPEN DEFECATION	Disposal of human faeces in fields, forests, bushes, open bodies of water, beaches or other open spaces, or with solid waste

Note: *improved facilities include flush/pour flush to piped sewer systems, septic tanks or pit latrines; ventilated improved pit latrines, composting toilets or pit latrines with slabs.*

The sanitation ladder is an important tool to assess progress in sanitation provision; extending sanitation hardware does not necessarily result in wellbeing gains of the served communities or users. For sanitation hardware to deliver its intended outcomes, it requires integrated service arrangements that consider and manage the roles, capacities and incentives of all stakeholders. Sanitation provision involves different providers and users across the SVC which might lead to ambiguous roles and responsibilities. Therefore, defining sanitation from a service delivery perspective is crucial to unfold the potential conflicting views and incentives regarding delivering it.

Onsite and offsite sanitation can be broken down into 'wholesale' and 'retail' services and infrastructure (Evans, 2007). The retail services are those which can be provided directly to the end-user or consumer, usually at the scale of the household (HH). Wholesale services are those that provide the 'shared' or 'common' elements of the system (e.g., networks of pipes or trucks to collect and transport waste, and treatment plants) (OXIRM, 2014). The retail service provision can operate on a smaller scale and can be disaggregated 'horizontally'

around the city (i.e., multiple service providers can operate in a single city). Wholesale services, by contrast, require central coordination and planning and are usually delivered by a single service provider throughout the city. For example, toilets and pit latrine/septic tanks installation, as well as the emptying services, are 'retail' services, delivered directly to the HH/user; the provider may have a direct relationship with every HH and the provider is able to afford the required tools to perform the job independently without referring to a larger investor and/or employer. By contrast, FS and WW transport and treatment plants are 'wholesale services'; they receive human waste from multiple users, including HHs, institutions and businesses and the operator will need to access machinery such as a vacuum truck (that he/she cannot afford to purchase/rent independently) provided by their employer. The wholesale elements of the service tend to benefit from economies of scale and tend towards being natural monopolies. Figure 2 summarises the service options that can be adopted across the SVC and categorises them under retail/wholesale services.

Figure 2: Retail and wholesale sanitation hardware (Author's own, 2023)

2.3 Providing Sanitation

Wholesale and retail sanitation services are funded through different channels. Wholesale services are usually funded by domestic public transfers, international public transfers such as ODA[1] grants, and repayable finance. Retail services are usually funded from either the user's expenditures on self-supply or through tariffs/connection fees. Hence, the main stakeholders involved in funding sanitation are as follows (Evans, van der Voorden and Peal, 2009; Trémolet and Rama, 2012; Mumssen, Saltiel and Kingdom, 2018):

1. **The users of the service:** the user groups vary based on various factors such as their income levels, willingness to pay for a service, hygiene awareness level, and service level preference.
2. **Governmental organisations (GOs):** the organisations involved vary based on the country's policies and development agenda. For instance, in some countries, organisations of environmental protection fund part of the sanitation services such as the FS/WWT, while in other countries, this is non-existent. Also, in decentralised countries, local government organisations are expected to fund sanitation; in centralised countries, the regional or national government organisations will remain the funding body for sanitation.
3. **Local non-governmental organisations (NGOs):** charities involved in the provision or support providing sanitation as a form of improving the wellbeing of their served communities.
4. **Private sector:** commercial partners, and private providers who see an economic value from providing sanitation.
5. **International development partners:** such as development banks, government and non-governnment agencies working with multilateral and bilateral donors to contribute to the development of a recipent country in line with international commitments such as the SDGs.

There is another set of stakeholders that can potenially invest in sanitation including national and international private banks, however, I exluded them because their role in the sector is currently negligible.

[1] The Overseas Development Assistance (ODA) is a governmental aid from one country to another, with the aim of promoting the economic growth of developing countries (OECD, 2019).

In onsite sanitation, users tend to be expected to cover most of the capital costs of HH containment hardware (e.g., pit latrines and septic tanks) since it is a retail service that does not require large-scale infrastructure. By contrast, in offsite sanitation users only bear the cost of the containment and HH sewer hardware (connection) through connection fees and charges, or this cost may be folded into the finances of the utility, depending on local policy (Daudey, 2018). The utility and other state organisations would bear the subsequent parts of the system such as bulk sewer networks, pumping stations, and treatment plants.

Who Delivers Sanitation?

There are many different technological configurations for the SVC, many funding stakeholders, and different components of the SVC may be sold as wholesale or retail goods in different contexts. This results in diverse service delivery arrangements, for example, self-provision, social provision by private associations like charities, market- based provision, social provision by state agencies and indirect state provision (Joshi and Moore, 2004). Exploring these different configurations allows us to investigate who provides (or could potentially provide) different components of the SVC, and why they might be incentivised to do so.

Since the 1980s, a global trend of neoliberal policies among established international financial institutions has pushed for the private market provision of Water and sanitation in low and middle-income countries (LMICs) (Castro, 2008; Schwartz and Schouten, 2007; Williamson, 2000). This is based on the premise that the private sector has the financial resources required to improve the industry. It is often justified with the claim that this would reduce inequalities in the sector and make the service accessible to the poor (Castro, 2008). Also, it is argued that the private sector has a strong incentive (i.e. profit) to increase the efficiency, recover investments and drive down service costs (Gray and Gray, 1981; Wellenius, Foster and Malmberg-Calvo, 2004). This trend is not exclusive to international financial institutions; some countries have also shown a strong appetite for private involvement in the sector, partly due to their failure to achieve universal access to affordable and efficient services (Castro, 2008). However, the 1980s privatisation trend was notably ineffective in addressing sanitation (Krause, 2007).

Private provision of sanitation has resurfaced lately as a means to increase sanitation coverage and other goods, as public utilities are struggling with performance inefficiencies (USAID, 2018; McGinnis *et al.*, 2017; Prasad, 2006). Private provision of sanitation can take various forms in terms of scale, formality, agenda, target users and funding sources. Despite the

increasing focus on private participation, there is no evidence of any private providers of solely sanitation services being in profit anywhere in the world. Private providers depend heavily on subsidies and support from the government and external donors (Bakker *et al.*, 2008; USAID, 2018; Acey *et al.*, 2019).

The counter premise to the private provision of sanitation is the recognition that WatSan are essential human needs and must be secured for all regardless of their capacity to pay for them (United Nations, 2014). This may be said to be in tension with the interests of private providers (Castro, 2008). Sanitation is also a public good that contributes to the wellbeing and prosperity of the served society only when most of the collective public can access it (merit good). Sanitation has several positive externalities, which I elaborate more about it in the following section. Free-market provision can therefore lead to an imbalance between the supply and demand, either providing insufficient services, or making redundant investment, and in either case compromising the community's wellbeing (Walsh, 1995; Keefer and Khemani, 2005; Andres *et al.*, 2019).

The premises of private and public provision to provide universal sanitation are heavily contested. Purely private provision has failed historically in high as well as LMICs to bring "*fresh private investments*" to the sector (Castro, 2008, p.3). It depends heavily on collecting service fees, state subsidies and borrowing (Azpiazu and Schorr, 2004). It is also argued that it has even increased both the local and global inequalities in WatSan services due to the "*very skewed pattern*" of service provision by private monopolies that avoided serving the poor (Castro, 2008, p.12). It is argued that sanitation is not an attractive investment opportunity for the private sector, particularly with the absence of regulatory and institutional arrangements needed to ensure high uptake (O'Keefe et al., 2015). Conversely, the public sector suffers from a lack of skills and planning capacities, low-cost recovery leads to low efficiency and eventually failure of the service (Reymond, Renggli and Lüthi, 2016; Zaqout and Hueso, 2020). Also, it is argued that the public sector does not have strong incentives to provide or improve the service, which is exacerbated by the unclear and fragmented roles and responsibilities causing overlap and poor coordination in the provision of sanitation (Ibid).

Nature of sanitation: a public or a private good?

The persisting conflict on the provision responsibility is partly due to the multifaceted service nature of sanitation and its differing value to society members (Mumssen, Saltiel and Kingdom, 2018; Schwartz and Schouten, 2007). Here I use institutional economics concepts (defined in the following box) to explain the nature of sanitation as a good and its value to

society, in a hope to identify the incentives and priorities of stakeholders in providing sanitation services. I use this section to firstly to elaborate on the nature of good (defined by the excludability and rivalry of a service). I have specifically focused on the nature of good discussion since it resonates with the discussion about the roles and responsibilities to provide sanitation in this PhD. The remaining part of this section elaborates on other institutional economics topics such market failure, demand and task-related characteristics using the service characteristics framework, which also covers the nature of good discussion (Batley and McLoughlin, 2015).

Excludability

the ability to deny non-payers from using or consuming a good without incurring high costs, for example, building a gate or security guards.

Rivalry

consumption of the service by one user subtracts its use by others, e.g., consuming food or buying a house (Ostrom and Ostrom, 1980; Harn*er et al*., 1986; Cremer *et al*., 1998).

Externalities

the benefits or costs to a third party that are not reflected in the market price (Cornes and Sandler, 1986; Hyman, 2011).

Services that are completely excludable and rival are defined as private goods such as food. Services that are excludable but non-rival are called club (toll) goods where individuals who subscribe to would use it jointly while excluding non-subscribers such as theatres and telecommunication Network (Ostrom and Ostrom, 1980). Goods that are non-excludable, but rival are defined as common-pool resources that require collective governance such as using a groundwater reservoir or extracting oil (Ostrom, 1990). The concept of common-pool resources has prompted heated debates in academia about the capacity of communities to collectively manage such resources in equitable manner taking the socio-economic and political challenges at play in a given context (see for example: Mehta, 2001; Cleaver, 2002) and whether it is simply endorsed marketisation (aggregated individual property rights) (de Soto, 2000; Obeng-Odoom, 2016). Goods that are non-excludable and non-rival such as air pollution control or national defence are considered public goods. Figure 3 summarises the four types of economic goods adapted from Hess and Ostrom (2003).

The notion of publicness implies the state's responsibility of the state to provide it as per the market failure theory since public goods are characteristics by externalities that that lead individuals and the private sector to underinvest in it (Mazzucato, 2016). Nevertheless, it is arguable that a good is only *a public good* when there is collective demand fostered by the political life of a society (Kopiński and Wróblewski, 2021). Kaul et al (1999) have also introduced the concept of Global public goods (also referred to as common good) to account for goods that are transboundary such as climate change and loss of biodiversity.

Sanitation offers varying benefits (outcomes) throughout the SVC such as privacy and dignity for the user of the toilet (upstream segment of the SVC) and environment protection benefits throughout the SVC. To illustrate, a latrine owner might disregard the importance of bearing the total cost of safe FS emptying and disposal to protect the surrounding environment because paying the minimum would still satisfy his/her personal need (emptied pit latrine). Therefore, reducing sanitation to one form of good would be misleading and unproductive.

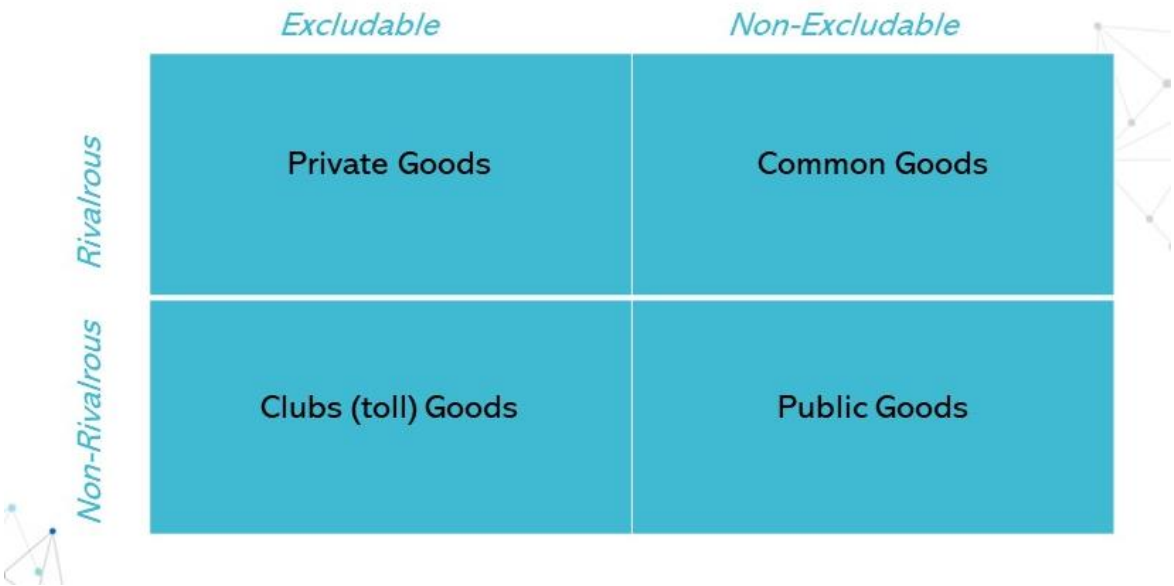

Figure 3: The four types of economic goods adapted from Hess and Ostrom (2003)

Retail sanitation services often provide a private good since the provider sells the service (e.g., HH toilet) on the scale of users – HH – and therefore it has mostly private benefits, while wholesale sanitation is often provided on the scale of a wider group of users (e.g., FS/WW treatment plant) which produces a majority of public benefits. To further understand the nature of sanitation as service I discuss in the following paragraphs the excludability and rivalry of sanitation infrastructure across the SVC, which lays the basis for my service characteristics analysis in light of understanding stakeholders' incentives to fund sanitation.

Figure 4 summarises my proposed categorisation of key sanitation services (both onsite and offsite) on the spectrum of public and private good.

Figure 4: Nature of good spectrum for onsite and offsite sanitation hardware (Author's own, 2023)[2]

Access to a HH toilet provides a hygienic and dignified place for the 'person' occupying it to relieve him/herself. These are not shared with 'non-users' and only people who reside in the HH (or other private premises where the toilet is located) are allowed to use it, making it an excludable service (Trémolet, Kolsky and Perez, 2010). The toilet is non-rival; one person can use it at a time, but it is available for others to use afterwards. Therefore, it is not purely private like consumable goods. 'Flying toilets', disposable bags used for collecting the excreta of an individual, are a purely private good because one use subtracts it from others.

Shared/public toilets, a widely adopted toilet provision, are to some extent excludable when a gate or lock is in place to prevent non-payers/subscribers from using them. Being open to a larger group of users than HHs makes the shared/public toilets partially a non-rival service even though each user would reduce the quality of the toilet for the next users significantly; a phenomenon that Cornes and Sandler refer to it as 'congestion' (1986). Partial non-rivalry

[2] The photos used are available freely from Google images

and excludability form a special case of public good referred to as ‘club good’ (Ibid), which is the case of a shared toilet facility.

In onsite sanitation, the second segment of the SVC is the FS collection and transport, which has both a private and public good nature. A HH or a public toilet operator can choose to pay for emptying (excludable and rival = purely private good) or for safe emptying and transport (non-excludable and rival = partially public good) because the safe handling delivers non-excludable outcomes (clean surrounding environment) enjoyed by the whole community, including, non-payers. The FS treatment plants or dumping sites are a purely public good because the provider would incur extra costs to exclude non-payers from using it (non-excludable), and using it does not subtract it from other users (non-rival) (Ostrom and Ostrom, 1980; Harner *et al*., 1986).

In offsite sanitation, the FS collection and transport segment is comprised of the HH connection and trunk sewer networks. The HH connection is a club good because HH connection would be extended only to payers (excludable), but one connection does not subtract it from others who wish to connect (non-rival). The trunk sewers, however, similar to the FS and WW treatment plants, are a pure public good because the provider would incur extra costs to exclude non-payers from using them (non-excludable) and using them does not subtract their use from others (non-rival) (Ibid). For instance, in many contexts where both FSM and sewered-systems co-exist, pit emptiers can pour the collected FS into nearby trunk sewers free of charge (non-excludable) because preventing them from doing so would incur additional costs, such as enforcing fines. Pit emptiers pouring FS in trunk sewers will not subtract the service (non-rival) from the users connected to the sewer network. The level of progress toward safely managed sanitation and its impact on the public health are key contextual information that determine the significance of service’s externalities, a key attribute of market failure, which I argue that it could influence our views on defining the publicness of a good. For instance, access to a private toilet contributes to an individual’s wellbeing and realising his/her right to sanitation, so it can be considered a private good. This aligns with Nickson and Franceys (2003) argument that urban WatSan services are potentially marketable private goods with excludable benefits and consequently the private sector could be involved in providing them. Conversely, if a community predominantly practices open defection (OD), it is a case of public interest to start using a toilet since OD poses serious public health and environmental concerns (externalities) such as waterborne disease outbreaks, child stunting, and malnutrition (Spears, Ghosh and Cumming, 2013).

While I show the spectrum of public and private goods (see Figure 4) based on the technical excludability and rivalry of each form of the services across the SVC, the governance context and state's policies dictate the level of contribution toward externalities which are a key characteristic to public goods. For instance, Nairobi City Utility in Kenya provides a subsidised offsite sanitation service to communities living in formal housing, while communities in informal housing are not eligible for such a subsidy, even to provide the lowest rung of the sanitation ladder that is not OD (shared pit latrines) due to their housing status (World Bank, 2019a). Fostering positive externalities by subsidising sanitation to informal settlements who still practice OD is not a priority for the city utility and therefore, those communities take full responsibility for providing a service or depend on external development organisations to support access to private and public toilets.

In summary, whether a sanitation service is perceived to have externalities (potentially a public good), it depends on factors such as the scale of the service provision, the public health and socio-economic status, governance systems, and policies in place. In addition, the values and expectation of the roles and responsibilities of the providers and users of sanitations services dictates whether sanitation is fulfilled or ignored. Hence, understanding the commitments of users and other stakeholders toward sanitation should take into consideration the complexity of private/public good division, driven by varying externalities, of sanitation services.

Institutional and economic characteristics of sanitation

Scholars of institutional economics suggest there are other institutional and economic service characteristics, beyond the nature of a good, that influence the stakeholders' incentives to contribute to the delivery of basic services such as sanitation (Cornes and Sandler, 1986; Ostrom, Schroeder and Wynne, 1993a). McLoughlin and Batley created the service characteristics framework (2012) that collates a set of service economic and institutional characteristics and how those characteristics influence stakeholders' incentives. The framework is comprised of four categories; the first category: nature of good, which I elaborated on it in the previous section, entails the two characteristics (rivalry and excludability) that define whether a good is a private, public or in between that; the second category: market failure entails the characteristics that influence the marketability of a service such as externalities and monopoly tendency; the third category: task-related entails characteristics that define the service provision arrangements; and the fourth category:

demand-related entails characteristics that impact or drive service demand and collective action such as territoriality.

The framework, which was developed in phases based on their research with the Overseas Development Institute (ODI) about political and governance challenges of service delivery, provides insights on how service characteristics create political salience for a service to be provided. Batley and Harris (2014) provide insights about the applications of the framework and draw relations, presented in Figure 5, between the four categories and their combined political salience. These insights are based on a series of consultations with experts from non-governmental organisations (NGOs), think-tanks and academia, in four service sectors: health, education, water, and sanitation (Ibid). For instance, the task-related characteristics create effect toward the monitorability of a service by policy makers and managers which in turn boost the demand-related characteristics and increase the user's capacity to organise demand and incentives of the services providers to offer the service (Ibid).

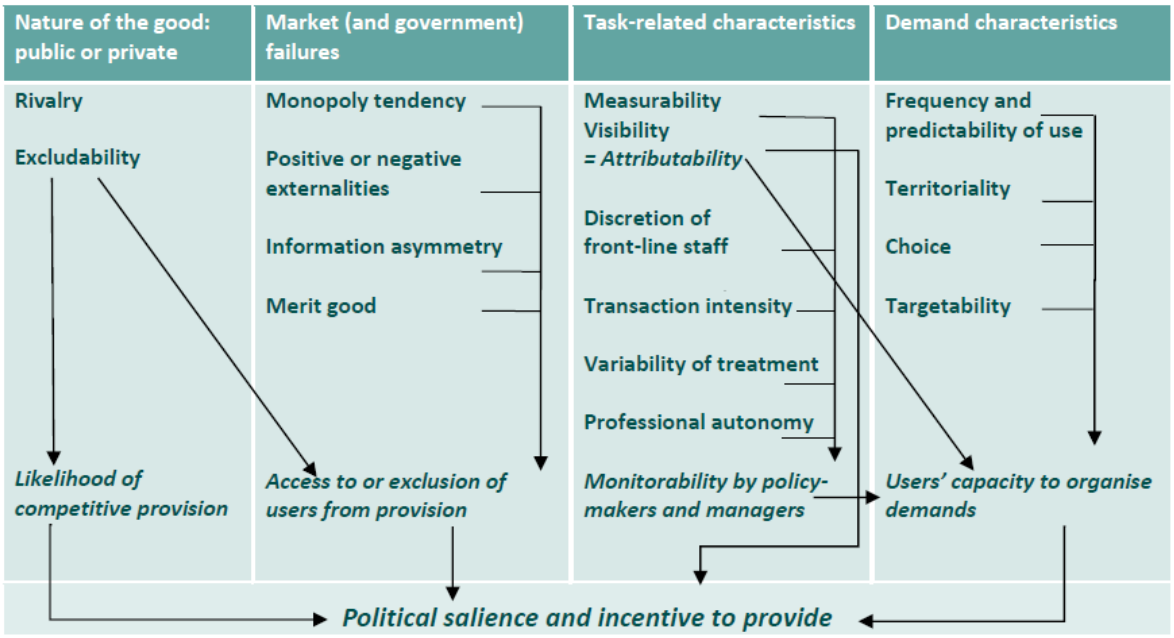

Figure 5: The composite impact and relations between service characteristics (Batley and Harris, 2014)

The characteristics, for example under the demand category, create combined effects toward the user's capacity to organise demand of the service. The combined effect can also be a product of characteristics of more than one category. For instance, the characteristics under the task-related category create combined effect toward the monitorability of a service by policy makers and managers which in turn boost the demand effect of user's capacity to organise demand and incentives of the services providers to offer the service (Ibid). Eventually, the four categories feed in the political salience of the services which create

incentives for the policy makers and service providers to offer and improve the service (McLoughlin and Batley, 2012).

In this thesis, I apply key concepts from this framework in my service characteristics analysis. as I agree with Batley and Harris' argument that shortcomings in providing a service are inherently associated with the characteristics of the service itself (Ibid). However, I did not systematically use all the concepts covered in the framework as my various attempts to do so have proven that some characteristics are irrelevant to the system I am analysing. The following sections discuss stakeholders' incentives in contributing to sanitation, and reflect on how those incentives interlink with the characteristics of sanitation services broken down into retail and wholesale services.

2.4 Stakeholders' Incentives to Contribute to Sanitation

The production of public services such as sanitation, unlike consumable goods produced in a factory, require coproduction by users and providers (Ostrom and Ostrom, 1980; Joshi and Moore, 2004). As users, state, private market, and aid have varying incentives in contributing to the SVC, conflict, or lack of collective incentives across the SVC will arise. Mumssen, Saltiel and Kingdom define incentives in WatSan services as "*the motivating influences or stimuli inciting people, and thereby inciting institutions, firms, and other actors involved in the WatSan services sector to pursue certain objectives or to behave in a certain way*"(2018, p.41). Incentives are the product of the existing policies, regulations, and institutional frameworks adopted in WatSan services (Ibid).

Sanitation Demand

Users' incentives to demand sanitation are not only motivated by the utility of the service (relieving oneself, health gains, clean environment), it is also motivated by the social norms (Mason, Batley and Harris, 2014). For instance, a study in Bangladesh showed that the convenience and prestige of owning toilets were key incentives, while in Ethiopia, security and privacy were the main incentives; the health gains from using private toilets were not enough incentivise sanitation investment in the two contexts (Allan, 2003; Mason, Batley and Harris, 2014).

Users also have technology preferences that are not necessarily those offered or provided to them (e.g., type of toilet technology or the choice between onsite or offsite systems) which might discourage their uptake and contribution. For instance, container-based sanitation (CBS) is an acceptable technology in LISs in Nairobi, Kenya (World Bank, 2019a), while the

same technology is faced with rejection in LISs in Cape Town, South Africa (Botha, 2018). In India, many poorer communities prefer OD over improved pit latrines (the technology most often installed under government programmes), but they would use a flush toilet rather than OD if given the choice (Coffey, Spears and Vyas, 2017).

Payment arrangements are also crucial for users' uptake of the sanitation services. Whittington *et al.* (1990) suggest that HHs with limited resources have more willingness to pay (WTP) for expensive services that offer flexible payment arrangements than cheap services with fixed payment arrangements or large one-off payments. Users' WTP is also influenced by their relationship with, confidence in, and expectations of the service provider. In some countries, society expects the state to provide WatSan services free of charge (Evans, Hutton and Haller, 2004; Schwartz and Schouten, 2007). Consequently, the user is not willing to pay for the service provided by the state, while he/she might be willing to pay double the fee if the service is offered by private providers, since the user does not assume it is the responsibility of the private provider to offer this service (Whittington *et al.*, 1990).

Additionally, economic status and housing conditions impact communities' interest in progressing on the sanitation ladder. To illustrate, a HH residing in an LIS Info might not consider the HH toilet with limited emptying (private good) to continue using the facility without safe disposal of FS, let alone the public good part, a priority since the HH has limited resources and other competing priorities for basic needs like securing food and shelter (Whittington, 2010). In a global study about spending and investments in basic services such as electricity, water, sanitation and telecommunication, HHs were seen to only invest in sanitation once they reached a significantly higher income level compared to when they invested in other services (Komives, Whittington and Wu, 2001). On the contrary, although it is not generalisable and depends heavily on the priorities and beliefs of the society, a higher income HH in better quality housing would likely already have an improved HH toilet (private good) and might be enthusiastic about adopting safe treatment and disposal of human waste (public good) to contribute to a sustainable planet for the next generations (WSP, 2015).

Private Market Incentives to Provide Sanitation

Demand is often the key driver to private market participation, which, as explained earlier, is insufficient for sanitation. In 19th Century Victorian London, WatSan was privately provided as a natural market response to high-class demand for home improvement; the same market was unwilling to provide WatSan to the less 'respectable' classes as those providers would

assume the other classes have low r WTP (Black, 2008). Therefore, the Sanitary Commission at that time had to rely on public action to improve the sanitary conditions of the LISs of London, such as the Public Health Act in 1848 (Ibid).

In the last two decades, many development actors started stimulating more private participation in sanitation to accelerate progress in LMICs. This shift stems from the repeated inefficacies of states and the assumption that the private sector would attract investments to sanitation services. Some organisations also incentivised, through financial support, governmental organisations to work with the private sector. For instance, in Faridpur, Bangladesh, the municipality has formed a public-private partnership (PPP) with two pit emptying groups who became formal cooperatives supported by Practical Action, an NGO based in the UK (Zaqout *et al.*, 2020). Nevertheless, such partnership, mediated and funded by external development actors, should be treated with caution as examples to be emulated, since those governments may engage in PPP to placate donors but not necessarily because they are interested in having a meaningful partnership with the private sector.

Other less conventional development actors such as philanthropists and private investors have elected to support the private sector in isolation from the government. Experiences in this arena are characterised by their specific interests which include promoting innovation and environmentally friendly sanitation solutions (Fejerskov, 2017). For instance, Peepoople, a Swedish for-profit company, developed the Peepoo bag, a single-use biodegradable toilet bag (to replace non-biodegradable plastic bags used as 'flying toilets'), marketed in Kibera, Kenya (Fischer, Kokko and McConville, 2021). The founders of the company faced rejection and disbelief from the development sector because of the simplicity of their product (Ibid). Later, they received support from fellow scientists motivated by "*developing circular and more environmentally sustainable sanitation solutions*" and piloted their product (Ibid, p.73).

Peepoo, after ten year of operation, failed to expand partly due their lack of engagement with key stakeholders and minimal understanding of the local context and development work processes (Fischer, Kokko and McConville, 2021). In summary, private sector incentives to provide sanitation, whether they are social, environmental, or commercial, must align with incentives of the other stakeholders involved, otherwise it will fail to scale and extend sanitation for all.

The Incentives of States to Fund Sanitation

States' incentives to fund sanitation are either endogenous, exogenous or both (Mumssen, Saltiel and Kingdom, 2018). Endogenous incentives stem from internal factors and the development context of the country, where the state demonstrates awareness of its issues, challenges, as well as its historical, cultural, and political context. Endogenous incentives are the primary driver of committing to providing the service in countries that are not donor-dependant. For instance, the incentive can be to improve and develop the sector, or more politically motivated, as happened in Brazil. The ruling party from 1968 to 1985 first improved WatSan services to legitimise its administration (Ibid).

In South Africa, the incentive to achieve WatSan reform was to achieve a sense of dignity and promote human rights concepts after the end of apartheid (UNDP, 2006). To date, municipalities in South Africa are pressured due to collective action and local activism to improve sanitation services in LISs (Robins, 2019). Other countries are motivated by promoting circular economy, such as in Sweden; Helsingborg and Stockholm aim to enhance further their WW technology through source separation of WW (Lennartsson *et al.*, 2019). All of the examples mentioned thus far demonstrate internal incentives for improving sanitation.

Exogenous incentives are the external factors, such as financial and technical assistance to states (Mumssen, Saltiel and Kingdom, 2018), as well as global initiatives and commitments to improve sanitation, such as SDG 6. According to Abeysuriya *et al.* (2019) and WaterAid (2016), the progress of LMICs in sanitation in the last decade is a result of the political commitments of countries to global initiatives such as the SDGs, human rights to WatSan and ending open defecation in India and Bangladesh. Changes of institutional arrangement in Albania were motivated by several political and administrative changes but it was also motivated by the country's desire to join the European Union which was conditional upon them improving basic services like WatSan (Mumssen, Saltiel and Kingdom, 2018). Unfortunately, political commitments that stem from endogenous and exogenous pressure to improve WatSan services often do not 'cascade' to the local leadership (Abeysuriya *et al.*, 2019). This is potentially due to not sharing similar vision/interests or do not benefit directly from such commitments unlike the higher-level political leaderships and/or not equipping the local leadership with the needed resources and capabilities to implement those commitments. For example, decentralisation in countries like Bangladesh put the responsibility of providing public services, including WatSan services, which is driven by political commitments due to

endogenous and exogenous pressure, on the local governments. However, decentralisation often does not translate into improving local capacities, legal and financial autonomy and thus there is little willingness to provide public services such as WatSan (Panday, 2017; Zaqout and Hueso, 2020).

Endogenous and exogenous incentives also influence the choices in resources allocation toward various sanitation technologies, scopes, and systems, based on the perceived benefits. Some countries adopt low-cost technology rather than alternatives that are seen as more 'modern' and more 'costly', based on their pro-poor policies and strategies that champion extending services to the poor (Mara and Alabaster, 2008). Other countries ignore the need to tackle the lack of pro-poor services, make technocratic choices, and endorse expensive orthodox infrastructure as they perceive other low-cost infrastructure as a second-class option (Paterson, Mara and Curtis, 2007; ISF-UTS and SNV, 2016). Such choice is a result of the historically and politically embedded preference for modernisation that seldom addresses the service's non-technical aspect, including the country's political economy context (UNDP, 2006; Kooy and Harris, 2012; Criqui, 2020).

Incentives for External Aid Agencies to Fund Sanitation

Slow progress in WatSan coverage due to shortcomings from public and private providers, mainly in LMICs, calls for the aid sector's participation. Domestic and foreign organisations such as INGOs, bilateral and multilateral donors, development banks, and philanthropic organisations provide sanitation either as humanitarian (emergency) or development aid. International commitments to achieve the SDGs related to WatSan have stimulated donor countries to fund. Donor countries are not only doing it out of kindness and concern about WatSan in recipient countries, but also to achieve other political and economic gains. States use aid to promote their domestic and international agendas. Also, on the domestic level, political leaders may promote their aid agenda to win domestic electoral votes as they demonstrate their international impact and leadership and disburse funds as long as it is important to their voters (Heinrich, 2013).

Aid commitments boost leadership internationally and form political and economic concessions between donor and recipient countries which impact donor's incentives in choosing recipient countries for sanitation and other sectors. The analysis by Dreher, Nunnenkamp and Thiele for the UN General Assembly voting behaviour of 143 countries between 1973 and 2002 showed that aid disbursements have shaped voting among donor and recipient countries (2008). France and United Kingdom (UK) tend to provide aid to their

former colonies to maintain their historical ties (Alesina and Dollar, 2000). Some donor countries target emerging economies to market their technologies and expertise (Clist, 2011). There are also emerging donor countries like China, Qatar and the United Arab Emirates who are heavily subsidising loans and providing aid overseas to increase their impact globally (Woods, 2008; Zureik, 2018). El Khanji's (2022) analysis of the incentives of ODA giving countries concludes that bilateral funding of WatSan is allocated mainly to effective recipient governments with low GDP; the exception is the United States. The geopolitical interests of the US in the MENA region, Central America, and the Caribbean shape its aid spending in WatSan (El Khanji, 2022; Wang 2011).

Selectivity is also perpetuated in prioritising specific services, fostering technological advancement, and transplanting best-practices reforms from donor countries and often with minimal regard to the context and the state capability of the recipient country to adopt those technologies (Andrews, Pritchett and Woolcock, 2017). Some countries, namely in the EU, have even shifted their interests in funding WatSan from the human right – access to basic services – to environmental conservation (Koch, 2015), which undermines the focus on user's preferred options such as full-flush toilet (FFT) to forcing 'environmentally-friendly' options such as CBS toilets which requires less water for its operation (although may not reduce overall water consumption by users).

Government and philanthropic organisations tend to fund large infrastructure and its expansion instead of subsidising recurrent expenses because it is a more transparent process. Reporting the supposed achievements of capital investment is said to be easier and more reliable compared to tracking funding for recurrent operational expenses (Andres *et al.*, 2019). Transparency is important to the people (e.g., taxpayers) and agencies donating aid to see where their money goes. Achieving transparency in funding recurrent expenses is data and personnel intensive due to the high number of transactions involved, which is not favourable in external assistance (Pritchett and Woolcock, 2004).

2.5 Barriers to Sustainable Funding Across the Sanitation Value Chain

Producers of a service such as sanitation (e.g., a private company or municipality) will need users throughout the SVC and other stakeholders to have incentives to contribute to the service in order to achieve the desired output (Newman, 1972; Ostrom and Ostrom, 1980). For instance, the value of extending a sewer network is only achieved when there are HHs connected to it. Therefore, it is vital to understand and align the incentives of the concerned stakeholders to deliver efficient and sustainable services, especially in funding arrangements

(Ostrom, Schroeder and Wynne, 1993b; Trémolet, 2011; Reymond, Renggli and Lüthi, 2016; Mumssen, Saltiel and Kingdom, 2018).

Retail Sanitation

As shown earlier, sanitation demand is associated with private good attributes such as privacy, prestige and cleanliness which are provided, and require less resources to be achieved, through the retail part of sanitation at the HH level (HH toilet, pit/septic tank emptying, and HH sewer connection) which users are inclined to pay for from the private sector offering it in a competitive market. When the HH level service is not applicable, for example, for tenants in an informal settlement, where they are restricted to a shared toilet (club good) users might be willing to pay for it and the private sector would therefore not provide it in the absence of demand. The private nature also allows targeted service delivery to a certain population or geographical area which is relevant to some politicians to gain popularity and external aid stakeholders as a mean to showcase their impact.

Keefer and Khemani(2003) argue that states and their politicians have more incentives to subsidise private goods instead of spending on 'broad-based public' goods. Targeted private goods to small groups increase visibility and achieve political gains with fewer costs and efforts. For example, during the Total Sanitation Campaign in India, political elites preferred targetable subsidies for sanitation hardware over sanitation promotion campaigns (Mason, Batley and Harris, 2014). States that receive aid will also consider their donors' preferences to secure funds. Many donors prioritise public goods which directly benefit the state if the good includes infrastructure, as the state come to own assets donated to their country.

The marketability of some retail sanitation goods in LISs might be an issue in commercial markets since they still have public good aspects and externalities, such as in the case of safe FS emptying and transport. Consequently, the private sector require additional monetary incentives beyond the demand of the public in order to minimise the commercial risks of the service (OECD, 2009). Considering the overall positive externalities of sanitation, states would need to work with the private sector to increase their incentive to provide the service while promoting equitable, inclusive and sustainable delivery, through engaging with continuous development and assessment of the service, including but not limited to selecting the technology, cost, promoting demand, and the pricing of the service. The state would need to provide financial incentives (subsidies) to the private provider to fill the gap between the cost and the affordability of the service (Ibid). Those incentives include financing for software such as capacity building, marketing, hygiene promotion programmes, and advocacy

at the national level (Evans, van der Voorden and Peal, 2009). It can also include hardware subsidies either for infrastructure construction or operational expenses (Ibid).

Outputs of some services are difficult to evaluate and have complex delivery processes as they involve many factors and stakeholders which makes them less visible to users. Limited visibility disincentivises some stakeholders from funding them (Mani and Mukand, 2007). The retail provision of FS collection and transport has complex arrangements, in many experiences around the world, it involves: pit emptiers, a business manager, an NGO and a local government institution, in addition to coordinating with a treatment plant operator (World Bank, 2019b). Therefore, it would be a misleading task for users to attribute the service to the state, assuming it is the main contributor. By comparison, when providing a private toilet, it is only a matter of the main donor/contributor and the HH arranging the installation for themselves (Trémolet, Kolsky and Perez, 2010). Similarly, recurrent costs such as operations and maintenance and human capital investments are not as visible as paying capital costs of a services, so some stakeholders rarely see it as a funding priority, which eventually cause the service to collapse (Mcloughlin and Batley, 2012; Batley and Larbi, 2004).

In addition, services of short-term outputs are more visible than services of long-term outcomes (Mani and Mukand, 2007; Rogoff, 1990). Stakeholders may choose to subsidise hardware of visible, instant outputs (hygiene kits, vouchers or toilets) instead of software, for example, sanitation promotion activities such as behaviour change, marketing and capacity building which have a longer-term outcome of involvement to improve sanitation but are less visible. The visibility of a service, as summarised in Figure 5, produces political salience which is irrelevant to the purely private market. Political salience is important for states and external donors to prove their commitment to providing services (Mani and Mukand, 2007).

Wholesale Sanitation

In contrast to retail services, individuals may be reluctant to pay for wholesale sanitation services that remain purely public goods (safe FS transport, trunk sewer, and FS/WW treatment plants). Wholesale goods are non-excludable and non-rival, so users will not voluntarily pay proportionally to cover them (Ostrom and Ostrom, 1980). Users do not need to pay to benefit from public goods; therefore, the private market will under-provide. In addition, these public goods require large upfront investments as natural monopolies, which the private sector would struggle to secure (McLoughlin and Batley, 2012).

The state would have an incentive to provide wholesale sanitation (public good) to leverage positive externalities and limit the negative externalities that undermine the collective wellbeing of society (Cornes and Sandler, 1996: Evans, Hutton and Haller, 2004; Mason, Batley and Harris, 2014; Andres *et al.*, 2019). It could also have the required upfront large investments and regulatory tools (e.g., taxes, subsidies, and bills) to ensure equitable provision and contributions from both the state and the served communities. Also the scale of those services require huge capital investments (Ostrom and Ostrom, 1980). Unlike retail, wholesale services are not targetable, so their visibility to stakeholders at the fore of the SVC (toilet users) is limited. Consequently, wholesale sanitation does not create political salience to the recipient population. However, it will be highly visible, as mentioned earlier, to some stakeholders, such as the recipient national governments, development banks, and multilateral donors.

Therefore, involvement of the state is necessary for the private provision of sanitation. However, states often choose not to support private providers, especially when the providers do not have registered businesses (informal) or offer the service to people living in informal settlements (considered illegal). For instance, pit emptying[3], is often provided informally to clients residing in LISs, and providers seldom coordinate or receive support from their local governments. In Kampala, Uganda the absence of regulation of pit emptying services has led to a monopoly controlled by truck owners who inflate prices (O'Keefe et al., 2015). informal settlements of Nairobi, Kenya, pit emptiers are subjected to assaults and theft from 'cartels' and do not have any protection from the government (Mallory *et al.*, 2020). In Bangladesh the private and informal providers of pit emptying service are not stimulated by the demand of the service but rather stuck in the profession due the associated colonial and historical caste and minority origins of the profession (Zaqout et al., 2020).

Figure 6 summarises the service characteristics differences (targetability, externalities, marketability, and visibility which are part of the McLoughlin and Batley service characteristics framework), which I discussed in the previous paragraphs, between wholesale and retail sanitation. I have intentionally discussed and visualised those four characteristics, because they were the most citied and discussed characteristics in literature about WatSan services and therefore they had the merit to elaborate on, unlike other characteristics such as

[3] Pit emptying is the removal of faecal waste from onsite sanitation (e.g., septic tanks and pit latrines) manually using basic tools like buckets, shovels and ropes. The practice is mainly provided informally to low-income settlements who do not have access to formally provided basic services.

the discretion of front-line staff which was discussed as a key contributor to the financial sustainability of sanitation. The scale of each characteristic is indicative of its significance in comparison between the two types of sanitation. For instance, targetability potential in retail sanitation (e.g., distribution of vouchers to construct toilets to a specific users/beneficiaries) is in general higher than wholesale sanitation (WW treatment plant serving the wider users' group). The costs and benefits from retail sanitation are often incurred or captured easier than wholesale sanitation. Due to the high externalities of wholesale sanitation is it less marketable than retail sanitation. Although the division between wholesale and retail sanitation is clear in those three characteristics, it is vague when discussing the visibility of a service. This is since visibility is strongly connected to the culture, access to information, and social norms; toilets' provision could be more visible for some communities while large 'noisy' FS treatment plants be visible to others.

Figure 6: Key differences between the service characteristics of wholesale and retail sanitation (Author's own, 2023)

In summary, there are varying stakeholders' incentive in a given governance context that interact with the service characteristics, which are dynamic and changeable based on the governance context. To explore this dynamic causal relationship, I chose different governance contexts with diverse sanitation services (onsite and offsite) for the four case studies of this PhD to showcase and aid the service characteristics discussion and the potential to rethink incentives in the light of understanding the service characteristics of sanitation.

2.6 Political Economy Analysis

PEA involves a wide range of approaches that examine the interaction of political and economic processes in a society. It attempts to understand the distribution of power and wealth among different groups and processes in place to maintain and transform the power dynamics in a society (Tsinda *et al.*, 2021). Conducting PEA in WatSan covers a range of issues including understanding how the political agendas of governments impact and are impacted by WatSan issues, and how the various structural issues support or hinder the development of WatSan in a given context (Ibid). PEA also explores the dynamics between national and local governments, governance processes, and financing (Abeysuriya *et al.*, 2019). There is also a stream in PEA that focus on the role of external stakeholders and their changing approaches such as moving from 'best practice' to 'best fit' approaches and how that influence the development process in a given setting (see for example Kelsall, 2011; Booth, 2012). In term of level, PEA fall under: country-level frameworks (see for example Gkiouleka *et al.*, 2018; Labonté, 2018), sector level (see for example Harris, Kooy and Jones, 2011; Criqui, 2020), and problem-specific or programme level (see for example DFID, 2009; Abeysuriya *et al.*, 2019). The PEA conducted in this PhD lies within the programme-level since I centre it on the SVC and its respective services in a given service area. The focus on services offers a level of detail that is often overlooked when conducting country or sector-level analysis. Unfolding the incentives issues through PEA is critical to assess its impact on service delivery (Kooy and Harris, 2012; Boex *et al.*, 2020).

There are PEA frameworks that address the stakeholders' incentives issue in delivering services such as sanitation, the scope of this PhD. Some PEA frameworks analyse the relationships between key structural factors – such as the historical and political context (see for example Scott, 2001) and existing institutions and stakeholders (see for example Ostrom, 2011). Ostrom's institutional analysis, is often debated whether it is truly 'political' as does not interact enough with power dynamics in a society (Cleaver, 2002; Kashwan, 2016; Abeysuriya *et al.*, 2019; Brisbois, Morris and de Loë, 2019).

This PhD combines key institutional economics concepts with in-depth engagement with the key political and structural issues in a hope to provide a 'political' reflection about incentives of stakeholders to promote financial sustainability across the SVC in the light of understanding the economic and institutional characteristics of the provided services. To do so, I adopt the service characteristics framework, presented in the previous sections, that highlights the causal relationship between the economic service characteristics, such as the

nature of good, externalities, and monopoly tendencies, with political salience of basic services and processes associated with it such as collective action.

As I explain in Chapter three, I build the service characteristics analysis in the light of key political economy challenges in each case study using literature and qualitative interviews. For example, I explored the apartheid experience in Cape Town and how it influenced the perceptions about sanitation and the consequent roles and responsibilities to provide it. I have also explored, in this Chapter and in Chapter five, the international interests to privatise basic services such as sanitation and its connection to land tenure and informality issues.

Conducting service characteristics analysis with such focus has, therefore, elevated the classical market failure discussion in economics to a more nuanced political economy discussion.

2.7 Conclusion

Providing safely-managed sanitation services in urban settings entails a heterogeneous set of retail and wholesale services. Heterogeneity across the SVC makes sanitation a special case of basic services that lies on a spectrum of private and public good characteristics. Most institutional analyses of sanitation offer simplistic dichotomies, such as labelling sanitation either as a private or a public good and therefore assigning the responsibility to provide either to individuals or collectively. Therefore, this thesis offers a more sophisticated analysis of the characteristics in real-world cases to fill the knowledge gap about the service characteristics and the institutional economics decisions associated with them.

The delivery of sanitation differs between retail and wholesale services, based on structural factors such as the political, demography and socio-economic contexts in a given location. Coordinating all segments of the SVC becomes a challenge when there is a complex array of stakeholders and incentives involved. The various typologies of governance regimes for delivering sanitation (e.g., monocentric, polycentric, and fragmented) influence the coordination of the roles and responsibilities to provide sanitation (van Weli*e et al*., 2018). The real-world cases presented in this thesis reflect on the interaction between service characteristics and governance regimes and how they influence the incentives of stakeholders to fund sanitation.

Chapter Three: Research Design

3.1 Introduction

This chapter provides the methodological basis of how I address the research questions. It provides reflections about the process of research and the rationale of my methodological choices. It starts by establishing the qualitative research approach adopted in this thesis. It then provides an account of the different phases of the research process. Finally, the chapter provides an overview of the ethical issues of this thesis and my positionality as an active instrument in this study. This chapter does not aim to provide an elaborate description of the methodological specification of each case study. Instead, it discusses the common higher-level methodological considerations and leave those details to be covered in the respective chapters of the four cases studies, which are presented in academic paper format with separate methods and material sections in Chapter four, five, six and seven.

The thesis examines how the economic characteristics of sanitation services influence the incentives of stakeholders to fund them. It then reflects on the mismatch of stakeholders' incentives and its impact on the sustainability of sanitation services. This chapter starts by presenting the philosophical grounding of the thesis.

3.2 Research Approach

Qualitative Methodology

As the thesis is concerned with gaining deeper understanding of the incentives issue in sanitation, a qualitative methodology is more appropriate than quantitative since it allows analysis of the research with an interpretive lens, because "*it is concerned with how the social world is interpreted, understood, experienced, produced or constituted."*(Mason, 2002, p.3). Those attributes are crucial for the study, as explained in Chapter two, stakeholders' incentives are shaped by structural features such as demography, politics, social norms, and the economy.

A qualitative methodology gathers data from a smaller sample compared to quantitative to often answer why and how questions while the quantitative often seeks to answer to find trends, produce statistical significance or simply to answer how many and how much questions. The small sample undermines the generalisability of research findings; however, it is a feature rather than a shortcoming as it prioritises depth over breadth and each scope and thus *"has its own merit"* (Patton, 2002, p.228). Unlike quantitative inquiries, qualitative research is not constrained by predetermined and standardised tools (Ibid). Besides, Edwards and Holland (2013) suggest that the analysis and theoretical grounding in a qualitative inquiry

is the ‘source’ of its generalisability. A key limitation of qualitative research is its susceptibility to misinterpretation because the data includes human language and the research process often depends on the judgment of the researcher (Tuli, 2011). To overcomes this shortcoming, I discussed my research findings and key arguments with different groups of researchers who are familiar with the context of each case study, this included the Bangladesh and UK WaterAid teams who provided reflections about the research findings. Similarly, the local consultants who supported the research in Nairobi, Cape Town and the Gaza Strip have also provided their reflections about the research findings and will contribute as co-author when I start preparing the case studies for peer-reviewed publications. I have also presented the preliminary research findings at a workshop for the Scaling up Off-grid Sanitation Research Consortium in South Africa in September 2022 and as part of the Water@leeds Confluence run by the University of Leeds in October 2022.

Case Study Design

This thesis takes a case study approach as it is useful in understanding the relationship between a group of people in a given context; it provides a holistic and in-depth approach to understand such interactions (Yin, 1994; Patton, 2002). Also, the case study design was particularly relevant for the analysis process as the institutional and economic characteristics of services and stakeholders’ incentives are context-sensitive (Mason, Batley and Harris, 2014); using the case study design emphasised the impact of context on the incentive issue. In this thesis, I use multiple case studies – units – which can offer more compelling analysis than one case (Yin, 1994), since those cases involved diverse contexts of varying impact on the incentives issue.

The phrase *case study* has been subject to diverse interpretations and uses. For instance, Yin (1994) defines it as a research method that uses a small number of qualitative analysis units and often involves field observations or ethnography. Campbell and Stanley (1963) and Eckstein (1992) use the phrase to describe a singular unit of analysis, while George and Bennett (2004) perceive a case study as a process-tracing research method. Gerring (2004)does not restrict case studies to a certain type of research methodology, nor does he reduce it to an organisational tool in a qualitative research inquiry. Instead, he departs from those interpretations to offer a more compelling one, which I adopt in this thesis. A case study design is “*an intensive study of a single unit for the purpose of understanding a larger class of (similar) units*”; a single unit is “*a spatially bounded phenomenon*” such as a state, an event, or persons, and researched at a specific temporal boundary (Ibid, p.342). I explain in

the case study selection the spatial and temporal boundaries of the selected four units of analysis in the following sections.

3.3 Research Process: Phase I to IV

The research process has been an iterative process as the research evolves and considering my learning curve as a doctoral researcher. However, here I compile the methodological considerations in the classic order: literature review, case study selection, empirical data collection, analysis, and reporting.

Phase I: Literature Review

The literature review included literature on the political economy of sanitation, institutional economics, and state capability. The key literature topics were identified based on the regular discussions with the PhD supervision committee and my peers and mentors during short conferences and research group meetings. Also, the formative case study, presented in the following chapter, has influenced the literature covered in the thesis. The literature search was an iterative process that lasted until I finished writing the thesis. For each case study, presented in Chapters four, five, six and seven the literature search covered peer-reviewed articles and grey literature about access to sanitation services.

Many research scholars refer to literature as a *secondary* data source and often use it to triangulate their *primary* empirical data. This study handles literature as key data source and a building block for the service characteristics analysis. I adopt the notion of David Silverman (2013) regarding the richness and validity of analysing documents as he endorses 'finding' data instead of 'manufacturing' it through the empirical qualitative data collection tools. For Silverman, literature documents *are "lively materials that have to be understood in their own right*" and not merely to triangulate empirical data, therefore focusing on manufactured data moves qualitative researchers to quantitative arena; data-intensive research with rigid research protocols (Ibid). Indeed, I analyse literature to capture how sanitation issues and stakeholders are perceived and portrayed from the perspective of researchers and organisations involved.

Phase II: Case Studies Selection

Initially, my PhD was going to address the sustainability of sanitation services in Bangladesh. The research started by exploring the sustainability issue of faecal sludge treatment plants (FSTPs) in four secondary towns, presented as the first case study (formative study). The focus on FSTPs was determined in collaboration with WaterAid policy teams in the United

Kingdom and Bangladesh; there is growing interest, from external and national stakeholders, to promote FSTPs across the country (WaterAid, 2019; Asian Infrastructure Investment Bank, 2019). Therefore, the research could inform better planning of such infrastructure. Due to the COVID-19 pandemic restrictions, my research in Bangladesh was interrupted. I pursued other contexts where I have more academic networks to ease empirical data collection during the pandemic.

Nevertheless, the formative study in Bangladesh informed the research design of the following case studies. It showed that incentives to fund other elements of the sanitation value chain (SVC), such as faecal sludge containment, collection and transport, were determinant to the functionality and sustainability of the study's FSTPs. Consequently, in the following three case studies I addressed the whole system – SVC – in each context to understand the key challenges in the sector. Therefore, the three case studies followed a more systematic approach to answer the research question, by assessing stakeholders' incentives toward promoting sustainability throughout the SVC.

As covered in Chapter two, market-based sanitation is increasingly promoted and is highly prevalent in low-income settlements (LISs). Therefore, the second case study explored stakeholders' incentives issues in the context of the market-based sanitation. The case study investigates the work of Sanergy, a private provider of container-based sanitation (CBS) in LISs in Nairobi, Kenya. Despite the small-scale operation of Sanergy compared to other providers, this case sheds light on the interaction between foreign private providers backed by philanthropists, the served population and the state. It also allows exploration of the key incentives challenges when providing safely managed sanitation throughout the SVC in the light of scarce resources and government budgets allocated toward sanitation.

The third case study provides an opposite narrative to Kenya. In the case of Cape Town, South Africa, the City of Cape Town (CoCT) is responsible for providing basic sanitation in LISs. For citizens, the colonial and Apartheid history in the country positioned dignified sanitation as a fundamental right that the state should guarantee for all its citizens regardless of their housing status. The CoCT provide an array of onsite and offsite sanitation technologies and outsource some of the services to private contractors.

The fourth case study explores the issue of stakeholders' incentives in donor-dependent regions within a humanitarian context in politically complex situation. It utilises the case of offsite sanitation services in the Gaza Strip, Palestine. A relation can be made between the

incentive issue in Palestine and the apartheid period in South Africa, which I briefly cover in Chapter six. However, the study took a pragmatic approach, as holding the Israeli Apartheid accountable is not feasible at the time being; it focuses on the influence of external stakeholders, a key player in the sector, on the incentives of local stakeholders and the delivery of sanitation service.

In the cases of South Africa and Palestine, I do not focus on a specific unit of analysis as I did in the case of Bangladesh and Kenya. I rather look at the issue of townships in Cape Town (South Africa) as a whole, considering that all those LISs receive a service funded by the CoCT with similar technology options (noting that sanitation provision across the country is not uniform). In Gaza Strip (Palestine) I do not specify a governorate or city since they are mostly homogenous in terms of the institutional and economic context and service provision.

As Table 2 shows, the four case studies are heterogonous in terms of institutional and economic settings and sanitation technology; this meant that the research process differed in some instances. However, the overarching findings provide a space for comparison and reflections on the broader policy and practice implication of this study in the sector. Heterogeneity among case studies aligns with Gerring's (2004) argument that case studies perform a double function by studying the unit itself and representing the broader class of units. Indeed, covering different technologies across the SVC in each case study has prompted more interaction with the service characteristics analysis, which is a key inquiry in this thesis as I discuss earlier in Chapter two. The case studies covered versatile scenarios of (non) excludable and (non) rival goods and their associated externalities which provided reflections on stakeholders' incentives in relation to the economic value of a given sanitation technology. Also, the various socio-economic and institutional features of the four cases also provided an opportunity to reflect on the study of service institutional and economic characteristics at different service delivery arrangements and scales.

Table 2: An overview of the four case studies

Case study	*Bangladesh*	*Kenya*	*South Africa*	*Palestine*
Unit of Analysis	Local government operations in four towns: Jhenaidah, Lakshimpur, Narsingdi, and Chowmuhani	Private sector (Sanergy) in Nairobi's low-income settlements: Mukuru and Mathare	City of Cape Town public services in Khayelitsha Township in Cape Town	Water utilities' sanitation services in the Gaza Strip
Sanitation Technology	Off-site (faecal sludge treatment plants)	On-site (container-based sanitation)	Various on-site (container-based sanitation) and off-site sanitation (sewered)	Predominantly off-site (sewered) and on-site in some towns (cesspits)
Features	Political stability, development loans, rural-urban migration	Political instability, development loans, rapid urbanisation, rural-urban migration	Post-apartheid inequalities, political rivalry, rural-urban migration, social activism	Protracted humanitarian crisis, political complexity (Internal division and Israeli Occupation), NGOs participation
Funding[1] Sources	Development banks loans, taxes	Philanthropic grants	National government grants, development banks loans and taxes	Development aid

[1] Funding allocated for sanitation services in the unit of analysis e.g., low-income settlements; not the funding for the country in general

Phase III: Empirical Data Collection

Silverman (2013) argues that many qualitative empirical studies could have been answered better with quantitative tools, especially when the researcher asks the participants the exact questions that the study aims to answer. While I agree with Silverman that many qualitative inquiries are excessively structured to the extent of losing the value of conducting it, I chose to deliver this research with support of empirical data. I am an *outsider* to most of the contexts in the study and as Silverman puts it "*people are only entitled to have experiences in regard to events that they have observed and/or which affect them entirely*" (Ibid, p.40). I do not claim that I am fully aware of the contexts or the processes that I cover, but interacting with the participants has offered nuance to my interpretations that, if I had only used literature, could have been missed.

Empirical data collection took place at different stages of the PhD to adapt to COVID-19 travel restrictions. Also, the empirical data collection for each case study involved different arrangements. In Bangladesh case, I conducted in-person interviews, in Nairobi case I conducted most of empirical data collection activities remotely and a local consultant conducted a set of in-person interviews, in Cape Town case I conducted all the interviews both in-person and remotely. Lastly, in the Gaza Strip case, a research assistant conducted the interviews in-person. In general, I had to structure the research guides carefully when I collaborated with a consultant or assistant to ensure the interviewer captured the key information that I was concerned with. This was important to avoid me speculating while analysing each case study, unlike the cases where I was the interviewer, which allowed me to follow up with further questions to confirm the views of the interviewees. I also had the chance to have a debrief meeting with the interviewers to discuss the key findings from their data collection, and I also shared the key findings with them to confirm that it is reflective of the data they have collected. In this section, I address the common topics among the four case studies, and I leave the details of each case study to the following chapters.

Semi-structured Interviews

Qualitative interviewing was the key tool for empirical data collection, particularly considering time constraints due to the COVID-19 pandemic, as interviews offer more rapid results than observational studies (Silverman, 2013). Interviewing takes different forms in terms of the formality level between the interviewers and the interviewees and the types and

structures of the posed questions (Patton, 2002). For all the case studies, I used an interview guide with a list of questions and issues to be covered in the form of semi-structured interviews. Using a semi-structured interview has the merit of an informal conversational style that establishes rapport between the interviewer and the interviewee while maintaining the focus on the research topic. The interviews covered: 1) knowledge questions to inquire about facts such as roles and responsibilities in providing sanitation, and 2) opinion and value questions to understand the interviewees' perceptions regarding the dynamics between stakeholders. Knowledge questions were mostly used to triangulate literature used in analysing the service characteristics in each case study, and the opinion and value questions were helpful for the stakeholder incentives discussion. I use quotations repeatedly to report the responses to the second type of questions as they "*reveal the respondents' depth of emotions*" (Ibid, p.22). The interview guides are included in the appendices section of this document.

Travel restrictions during the COVID-19 pandemic has severely impacted my field work plan, with restrictions lasting from the beginning of my 2nd year (January 2020) until the end of the 3rd year of my PhD (December 2021). I had to adopt to various interviewing arrangements which included remote interviewing, working with research collaborators, and by the middle of the 4th year I finally managed to conduct in-person interviews for the South Africa case study. Patton argues "*validity in quantitative research depends on careful construction to ensure that the instrument is measuring what is supposed to measure… In qualitative inquiry, the researcher is the instrument…*" since the credibility of qualitative methods is closely related to the competence, and rigour of the person doing field work and all the things going in their lives (Ibid, p.14). Therefore, myself and the research collaborators who conducted the interviews in Kenya and Palestine might have influenced the collected data, and this had to be considered during analysis and the writing of this thesis.

Sample Size

Deciding the appropriate sample size of interviews for qualitative data collection is assessed by saturation, "*the point at which gathering more data about a theoretical construct reveals no new properties, nor yields any further theoretical insights about the emerging grounded theory*" (Bryant and Charmaz, 2007, p.611). Although saturation is a crucial indicator for judging the validity and rigour of qualitative inquiry, there is no universal rule for judging it (Hennink and Kaiser, 2022). Some qualitative scholars decide on the saturation of their sample by using statistical models to measure the significance of codes. Reviewing the

collected data is a more accepted approach than the latter since using prior-defined statistical models built based on the researcher's assumptions diverts the inquiry to prioritise generalisability and statistical significance over depth. Hennink and Kaiser call this approach 'Code Meaning' and argue that saturation in a study can be reached at a different stage for each code/dimension of the study (Ibid). I purposefully recruited interviewees to discuss issues related to the research inquiry. As the interviews progressed, I reviewed the transcripts and issues raised to identify emerging issues or dimensions to be covered in the following interviews, until no new dimensions emerged.

In all case studies, the sample size of interviews did not exceed 20 participants. However, using the sample size to judge saturation is problematic since qualitative inquiry does not aim to reach generalisable findings or statistical significance. Francis *et al.* (2010)argue that saturation in qualitative inquiries should determine whether the data have captured the depth, nuances and various dimensions of the studied phenomenon. Similarly, therefore, "*rigorously collected qualitative data from small samples can substantially represent the full dimensionality of people's experiences*" (Young and Casey, 2019, p.12). Hennink and Kaiser (2022)reached the same conclusion from their systematic review of the reporting of sample saturation in qualitative research. Besides, the service economic characteristics analysis in this thesis is based on literature and the empirical data are used to complement and triangulate literature. Hence, purposeful sampling can achieve saturation without excessive empirical data collection.

Phase IV: Data Analysis and Reporting

This thesis uses inductive thematic analysis to develop an in-depth understanding of the research problem. Immersing oneself in and coding data inductively helps in identifying the key issues associated with the research problem, without enforcing a pre-defined framing of the research findings (Ulin, Robinson and Tolley, 2005). The inductive analysis started along with the empirical data collection to make sense of the emerging themes to embrace the "*emergent nature of qualitative design*" (Patton, 2002, p.436). Overlapping between data collection and analysis is beneficial as long as the initial analysis does not overwrite the analysis process (Patton, 2002; Corbin and Strauss, 2008); it generates insights and reflections on the data collection process to explore more themes related to the research problem in the following interviews and case studies.

In each case study, I first organised the data (literature and interviews transcripts) into a series of codes[4] and identified the key emerging themes from them (thematic maps). Each code represents a key emerging topic from literature and/or empirical data, and each set of related codes was grouped into an overarching theme. For instance, in the FSTPs case study (Chapter four) in Figure 9, the 'external development actors' was a key theme emerged from the analysis where it ties together and influences key aspects (codes) of the service such as the 'political will' to contribute to 'cost recovery' and 'local capacity' building. It also interacts with key theme 'unbalanced' partnerships' driven by issues such as devolved governance and political will (codes) that result in ad hoc projects (code).

As the case studies are not similar in their scale (for example the case study from Bangladesh focuses on wastewater treatment, the case from Nairobi focuses on all the services provided by Sanergy Social Enterprise), the spread of the topics has differed a lot. The specific focus of the case study in Bangladesh on wastewater treatment led to a thorough coverage of challenges associated with its sustainability, while the mapping in the case study from Nairobi was focused on market-based sanitation issues, since Sanergy Social Enterprise was the focus of the analysis. The issues emerged from the case of Cape Town was focused around the historical experiences of the black and coloured population of Cape Town such as race-based segregation and later their use of sanitation (toilets) to protest inequalities during and after the end of apartheid. Unlike the previous three case studies, in the case of the Gaza Strip, the mapping provided a more general view about challenges in that region and how it is deeply connected with wider national and foreign political challenges. A key challenge in qualitative analysis is making sense of a massive dataset and trying to "*reduce it to patterns and constructing a framework for communicating its essence*" (Patton, 2002, p.432). Appendix 3.3provides the code books for the thematic mapping of the four case studies presented in the PhD. Unlike quantitative research, there are no formulas or rules to judge the validity and significance of the findings. Therefore, some researchers provide exhaustive reporting of the procedure, or incorporate deductive parts based on existing research to improve the validity of their research methods (Corbin and Strauss, 2008).

As explained earlier, the formative case study (FSTPs in Bangladesh) took a less systematic form of analysis. I thematically analysed the empirical data centred around the four FSTPs in Bangladesh. While for the following three cases in Kenya, South Africa and Palestine, the

[4] "*Codes are short statements that capture the meaning of the phrase, and can be used to index the data and group together phrases with similar ideas or meaning"* (Chapman, Hadfield and Chapman, 2015, p.203)

research adopted the SVC concept throughout the inductive and deductive (hence why I put it as a common stage between the two in Figure 7) analysis processes to prevent reducing the research inquiry to one segment of sanitation; for examples, almost all the found literature in South Africa focuses only on the containment segment (toilet). This also helped identify the potential funding gaps throughout the SVC. Throughout the three case studies (Chapter five, six, and seven) I use the SVC to structure the presentation of the key findings about sanitation services, the service characteristics analysis and the key discussion elements and I also use it as a reference point to discuss the key findings of this thesis in Chapter eight.
In the second part of the analysis incorporated a deductive analysis by interrogating the findings from the inductive thematic analysis and the incentives issue (covered essentially from the literature review in Chapter two in addition to literature in the respective case studies) against the SVC. The deductive analysis was guided by Batley and McLoughlin's (2015) service characteristics framework, covered in Chapter two, as a guide for relevant concepts and relationships. In reporting the key findings and discussion of the three case studies, I do not use the key themes emerged from the inductive analysis to structure those sections as it was only a steppingstone to identify key institutional and economic issues that feed in the main analysis segment (deductive analysis throughout the SVC).

I combined inductive analysis with established concepts in the Batley and McLoughlin's framework in order to minimise confirmation bias, as those concepts provide some structure to the relationships and related theme (Harris, 2013). The deductive analysis followed a systematic approach by addressing each segment across the SVC, as shown in Figure 7, in the following deductive analysis step, I attempted to follow the same rigorous analysis using each segment of the Batley and McLoughlin's framework, but this proved counterproductive as some service characteristics were not relevant in the studies context; I elaborate on this in the following chapters. Data analysis in each case study was an iterative process that started by the thematic analysis to triangulate and check for contradictions between literature and empirical data not only for facts, but also for the views and beliefs of stakeholders that impact their incentives.

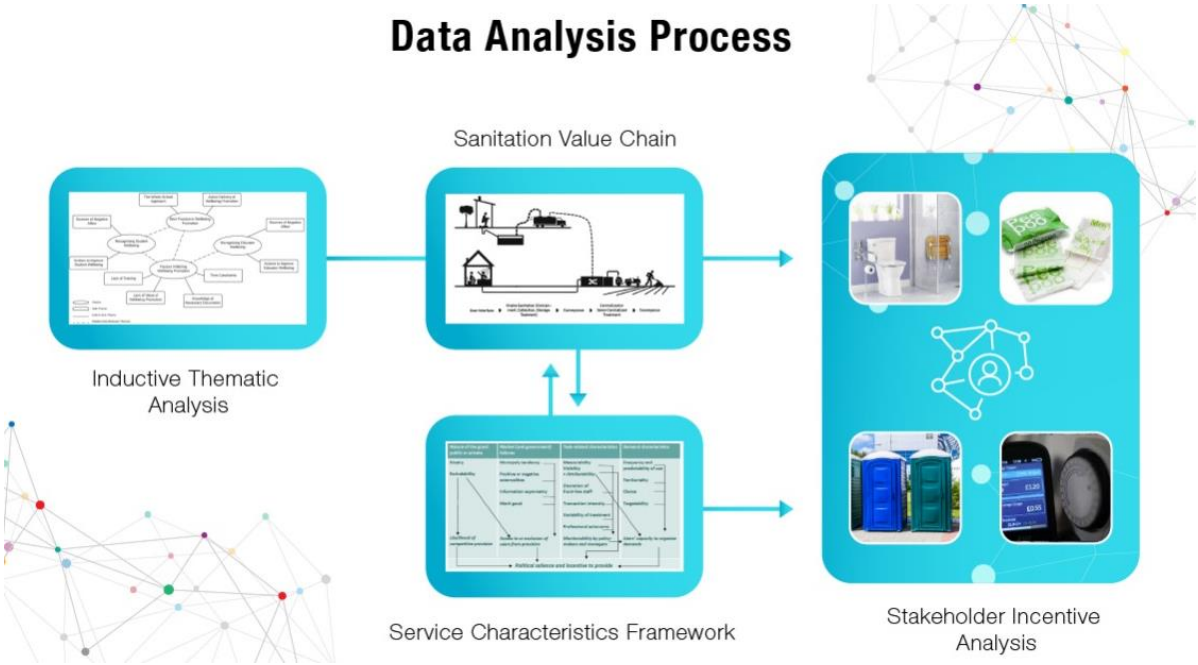

Figure 7: Data analysis process (Author's own, 2023)

The inductive thematic analysis identified the key institutional and economic features of the case studies and its impact on stakeholders' incentives. For instance, the social dynamics of the LISs in Nairobi and Cape Town and how they impact access to sanitation services. The thematic analysis also captured the roles, responsibilities, and conflicts between the key stakeholders in each case study. As explained in Chapter two, there are several stakeholders involved with sanitation. Nevertheless, to enable productive analysis, I focused on the most relevant stakeholders in the case study involved in achieving the desired outcomes for basic sanitation: *the disposal of human excreta to prevent diseases and safeguard privacy and dignity*. For instance, the farmers in Sanergy's case (potential users for the organic fertiliser), and environmental protection agencies were not included as stakeholders as, at least in the current operations, they do not contribute directly to the end goal of basic sanitation. Therefore, the group of stakeholders in each case study varied to represent the context. For instance, I do not consider external donors as a stakeholder in South Africa since their role is almost non-existent, while in Bangladesh, Kenya and Palestine I address them as primary stakeholders, considering their substantial role in funding sanitation.

3.4 Positionality, Ethical, and Methodological Reflections

Self-reflection about research is vital as "*research is a process, not just a product*" (England, 1994, p.82). Bourke suggests that it is part of the process to reflect on all the stages of research starting from development of the idea to the dissemination of research findings (Bourke, 2014). Reflexivity also leads to ongoing learning, growth of the researcher and

refining her/his craft (Freire, 1970). Unlike quantitative research, the researcher is the instrument in a qualitative inquiry (Patton, 2002). Hence, the credibility of a qualitative inquiry depends on the competence and rigour of the person conducting the research. In addition, the beliefs, political stance, and cultural background (gender, race, class, socioeconomic status, educational background, etc.) of researchers shape and influence their approach to conducting research (Ibid).

Positionality

Hall argues that researchers must first *position* themselves somewhere to have a say about a subject matter (1990). Positionality is particularly important in qualitative research as it explores individuals and their experiences (Bourke, 2014); interpreting such information is highly subjective. Therefore, striving for objectivity is essential to achieve credibility, but seeking complete objectivism is 'a naïve quest' since separating oneself from the research subjects is impossible (Ibid).

As my standpoint regarding water and sanitation (WatSan) service leans toward advocating to protect the human right to basic sanitation, I often challenge the distribution of roles and responsibilities among stakeholders in this report. I also channel my frustration with the tendency, commonly associated with engineering, to deal with sanitation as a technocratic issue without addressing its governance issues. In addition, my prior experience and work in the Gaza Strip have influenced my view on the challenge of providing universal sustainable and equitable sanitation. Thus, when I interacted with participants, analysed, and reported findings; I did so with my Palestinian identity and experience and as a multidisciplinary researcher. However, my position in the four case studies varied between outsider and insider.

I am primarily an insider in the Gaza Strip case study; I belong to that geographical place and community and share their collective memory of Occupation, internal division, and de-development. This has made the research process emotionally triggering, which I tried to channel into the wish to voice my people's struggle. The shared experiences, history, and knowledge assists insiders in "thinking as usual" (Collins, 1986); this meant not using neutral language, especially when talking about the Israeli Apartheid, which outsiders might prefer to ignore in fear of being accused of partiality.

My stance might impact the publishability of my research, taking the current accusations of anti-Semitism when speaking up about the human rights violation of the Israeli Government. For instance, as a Palestinian researcher living in the United Kingdom, I have been asked, in

some cultural events, to condemn acts of resistance led by Palestinians against the Israeli Occupation. Also, some of my fellow Palestinian academics have even asked me to ‘tone down’ my writing since it is not acceptable in the international development sphere. Taking this closed cycle of blaming the victim, I believe it is important to name things as they are. I also found in my stance that I tried to compensate for the feeling of being an ‘outsider’ since moving to the UK in September 2017, especially for the guilt of not witnessing in-person the last two Israeli aggressions against the Gazans in May 2021 and August 2022. Therefore, I believe it is crucial to stick to my narrative. Reading literature about Cape Town, conversely, it is characterised by the strong language of calling out apartheid and its legacy. It only made me hope that scholars writing about Palestine in such spaces will be empowered to call out that similar apartheid.

In the Cape Town case study, I needed to digest a complex history of race-based segregation associated with colonial times and apartheid. My identity as a non-white Palestinian woman may have created space for participants in Cape Town to engage with curiosity in my research objectives. Several participants showed interest in my experience and the research findings of the Gaza Strip case study. Many South Africans show solidarity with the current Palestinian struggle with the Israeli apartheid and how it resonates with South Africa's history. As a Palestinian researcher, I made a similar association between South Africa and Palestine when I selected them as case studies, wondering whether I would find a correlation between the two realities.

The historical contexts of the two apartheid systems are unique and entail different challenges that the indigenous people had/have to endure. Inequalities between the Palestinians and Israelis regarding access to basic services resonate with the discrimination and inequalities produced during apartheid in Cape Town. However, when addressed in WatSan-related literature, the inequalities produced by the Israeli Apartheid are not referred to as explicit apartheid, as in South Africa. Taking too lightly the inequalities issue between the Israeli and the Palestinians is probably due to the problematic treatment of Palestinians' issues as humanitarian crises. Therefore, offering shallow solutions for the symptoms of apartheid instead of looking at the bigger picture and the Government of Israel’s role in promoting race-based discrimination perpetuated (in the scope of this study) by the de-development of the basic services sector.

Organising my research in Bangladesh involved close collaboration with WaterAid team in Bangladesh and the UK has given me access to interview local and national government

personnel as WaterAid work closely with those institutions. I was privileged to have such access, which I recognised as I struggled to access governmental personnel in the other case studies. In Bangladesh, my identity as a Muslim Palestinian helped me build rapport and trust with the interviewees as the headscarf for women is favourable in Bangladesh, and there is solidarity from the Bangladeshis with the Palestinians cause, especially as both countries are predominantly Muslim. Many interviewees were interested to know more about Palestine, and some express their empathy and support. The access I received in Bangladesh and South Africa, because of my identity, might have influenced my sampling, interpretation, and the findings I opted to highlight in the thesis.

The case of Sanergy services in Nairobi, had different conditions; it is an international organisation that aims to scale its service model and therefore my position as a researcher was difficult, as they showed interests in collaboration but there was a caution about my study and the potential reputational consequences for them. Prior to their decision to participate in the study, I submitted a research brief with a detailed list of interview questions. I was also interested in conducting a participatory analysis session with and the local government, however, they declined due to the fragile political context and the sensitivity of the relationship between Sanergy and Nairobi City County. The interviews with Sanergy were triangulated with literature, especially their own publications, to capture any contradictions. Collaborating with Sanergy has allowed me to access key personnel involved in the planning and operations of Sanergy sanitation services in Nairobi. Working closely with Sanergy as a gatekeeper might have influenced the data collection process. Interviews were also conducted with other stakeholders, as I detail in Chapter five, without Sanergy as a gatekeeper, to gather the varying views about the viability of their business.

Ethical Reflections

In addressing the ethical dilemma of research, Silverman (2006) suggests interrogating two issues; firstly, to evaluate the reasons for choosing the research topic as researchers identify topics that relates to their values and what they think is important (Weber, 1946). Indeed, choosing to focus on stakeholders' incentives aligns with my belief that providing equitable access to at least basic sanitation still lacks organised and sustainable efforts and I claim that understanding stakeholders' incentives would unfold the root causes of the slow progress in improving access to sanitation. The topic also resonates with my first-hand experience and frustration during my time working in consulting groups in the Gaza Strip, as there is a viscous cycle of failure and ineffectiveness in development efforts.

Also, for the formative case study, the research objectives were developed in direct consultation with the practice partners (WaterAid UK and Bangladesh). WaterAid identified the importance of filling the knowledge gap about the functionality of the studied FSTPs (they were never evaluated after construction), while the GoB and its development partners were planning similar plants across Bangladesh. Although WaterAid helped define the scope of the study, it did not interfere with the data collection, analysis and reporting processes of this study and the report of the study was shared internally and externally as an independent piece from WaterAid. Understanding the incentives of the local stakeholders toward maintaining the sanitation infrastructure, funded through the national government and its external partners, would provide insights for planning and delivering similar projects. The findings and recommendations of this study were published in a practice-oriented peer-reviewed journal (Waterlines) and communicated with several representatives from development organisations to inform their decisions toward funding such infrastructure.

The second issue that Silverman (2006) highlights is the position and relationship of the researcher and the participants. As not all research can offer help or benefit participants, at least directly, it is vital to ensure protecting them. Potential hazards associated with interviewing people include exploitation, deception, and identification of subjects, clashing with groups we dislike and pressuring people to participate in the study. As the main data collection stage was intended to start at the same period when the COVID-19 pandemic began, the travel restrictions allowed me, and my supervisors, to re-evaluate the need for an elaborate overseas field work trip. Planning data collection took into consideration the exploitive nature of research conduct and excessive data collection leading to wasting resourcing and burdening participants (Francis *et al.*, 2010). Therefore, the decisions about the sample size and recruited research participants were intended to be minimal.

To do so, I started the empirical data collection by interviewing experts to explore the potential of using their existing data sets, where relevant to my study. Expert interviews were intended to replace interviewing households, as the perspective of households (HHs) was important to cases. Nevertheless, I was aware of upcoming HHs surveys in both the Kenya and South Africa cases as part of a research project within the university, so my supervision team and I agreed not to conduct HH interviews. The COVID-19 pandemic and its ensuing travel restrictions made many researchers revisit the necessities of conducting extensive data collection for their research activities and research questions.

Exploitation is also associated with interviewing vulnerable groups; vulnerability has many dimensions, such as gender, age, social status, disability, and others, and it often contributes to vulnerable groups being unable to stand up for themselves. The study generally included interviews with professionals in government and non-governmental organisations, social activists, and researchers. In the case study of Sanergy in Nairobi, the interviewing included four interviews with potential customers (landlords) and workers (pit emptiers) for Sanergy, who might be considered vulnerable groups. However, the interviews did not cover sensitive topics and only focused on their perceptions of working with Sanergy. Hence the sensitivity of the conversation between the interviewees and the interviewer was minimal. Also, a local consultant conducted the interviews, which removed the language and cultural barriers between the interviewee and the interviewer.

In terms of identification, most of the participants expressed they are happy with revealing their identities for different reasons, including the potential to become known to outsiders in hope of potential support or collaboration, other groups, of advocacy nature, also were comfortable with sharing their identities as the research topic is relevant to their advocacy and their position concerning the topic is well-known. Some organisations, especially those involved in service provision, preferred to be anonymous to prevent any potential harm from their participation. There are also instances where participants asked to keep some personal views off the record as they felt they did not represent their organisation's views.

Informed consent ensures the rights of participants by ensuring they know they are being researched, informing them about the nature and aim of the research, as well as the consequences of their participation, and allowing them to withdraw at any time (Ryen, 2004). All the participants in this study received, via email, a consent form and an information sheet (see Appendix 3.1 Consent Form) when I invited them to the interview, in the case where the research assistant or the local consultant coordinated the interview, they communicated those documents with the interviewees before they made the decision to participate. Sending those documents when we first approached the interviewees was important to empower potential interviewees to make informed decisions about their participation.

I chose not to take photos from my field trip in South Africa, and I did not ask my research collaborators to visit the site of public toilets to do so in this and other countries. Using toilets is a personal matter that many of us feel uncomfortable discussing. During my field visit to a LIS in Cape Town, I could not help but put myself in the shoes of its residents, and how I

would feel if someone came to take a picture of my toilet, so to me, that potential harm exceeded the benefit. Besides, several published materials document the conditions of sanitation services in the studied cases. Interestingly, some of the interviewed community activists were keen that I take photos of the communal toilets in their settlement to amplify their voices as they advocate for better housing and sanitation services. However, I declined politely and explained further my role as a researcher, hoping that my findings would still amplify their voice. As for the study of the FSTPs in Bangladesh, I provided photos for the FSTPs as advised by other collaborators as evidence of the functionality of each FSTP, and the field visits included the operators of those plants, but this is a less personal matter compared to toilet use.

The ethical hazards in research continue as we analyse and report our findings. Gillan and Pickerill (2012, p.133) suggest giving voice to the groups "*who feel under-represented in their societies*". Thus, in the research analysis, I was committed to the narrative of sanitation users and their right to dignified sanitation. For instance, in the Cape Town case, I reflect on sanitation technology from the point of view of the coloured and black communities, whether they consider a particular toilet technology is dignified or not, leaving aside my personal views and the views of the City of Cape Town (CoCT) about that technology.

Similarly, I do not blame the local government and non-government organisations for sustaining sanitation infrastructure in the Gaza Strip case study. The Gazans live in a protracted humanitarian crisis and have lost their right to self-determination; the Israeli Occupation and foreign agendas obstruct any internal efforts to improve essential services. In general, my approach conflicts with Robert Dingwall (1980, p.874), who claims that social research should aim to be generalisable, instead of having "*synthetic moral outrage,"* by even-handling the 'villains' and the 'heroes'.

Finally, all the data collection activities received ethical approval. The formative case received ethical approval (MEEC 17-032) from the Maths and Physical Sciences and Engineering Faculty Research Ethics Committee. The following three case studies received ethical approval (AREA 20-114) from the School of Social Science Human Research Ethics Committee. My supervisors and I decided that the latter Committee was more suited to assess the ethical issues for such a study.

Methodological Limitations

This thesis includes data collected from literature and qualitative interviews, and its preparation entailed various inputs in terms of time, place, and individuals involved, which introduced various limitations. In most instances, I tried to mitigate the impact of those limitations on the credibility and validity of this research.

1- Working with Gatekeepers

Gatekeepers were involved in the empirical data collection activities for the case studies in Bangladesh and Kenya; in both cases it was inevitable to coordinate with gatekeepers as I was interested to either interview staff from their local government offices (DPHE) or their staff (Sanergy Enterprise). The gatekeepers were involved in coordinating the interviews and, in Bangladesh's case, in selecting the FSTPs location to be covered in the empirical study. This might have influenced the data collection process, but as explained earlier, the selected FSTPs had varying functionality levels which helped me achieve the research objective by reflecting on the varying incentives and capacities of the local governments involved in such projects. For Sanergy, I conducted interviews with professionals and academics not affiliated with the company, to limit the potential bias from interviewing its personnel.

2- Sample Selection Bias

As I explain in the following chapters, I faced challenges in recruiting research participants in some case studies. This might have caused unintended sample selection bias. For instance, in the case of Cape Town, the delay in receiving the ethical clearance from the CoCT caused me to overrepresent the activist groups compared to the government representation. Similarly, in the case of the Gaza Strip, the lack of response from external donors has made the interviews focus on the local experience of service providers, including local and international NGOs. Nevertheless, the over-representation of some groups is sometimes more suitable for producing ethical research that gives voice to the under-represented in the development sector (Gillan and Pickerill, 2012; Silverman, 2022). Reports of sanitation programmes are often written by leading organisations such as the CoCT or the donor agencies in the Gaza Strip.

3- Generalisability

As I mentioned earlier, the cases were selected to showcase the application of service characteristics analysis to understand stakeholders' incentives in varying institutional and economic contexts. However, the selection does not imply generalisability of the research findings, as qualitative inquiries are not particularly interested in such thing. Besides, promoting generalisability is problematic in development- research as it assume "*collective*

experience, community spirit" which is never the case (Laws, Harper and Marcus, 2003, p.275)

3.5 Concluding Remarks

This chapter is an overview of the research approach and the key methodological choices starting from selecting the case studies, data collection and analysis, and other methodological reflections. I provide reflections on the common methodological issues in each of the four case studies (presented in the relevant chapter). This chapter does not report the granulated information of the research methods and materials for each case study, as it makes more sense to report these in the respective chapters of the case studies, since the studies are not identical, and to present the information when most appropriate for the readers as they engage with each case study in detail.

Chapter Four: Providing Municipal Faecal Sludge Management Services in Bangladesh

Published Peer-reviewed Article

Zaqout, M. and Hueso, A. (2020) 'Providing municipal faecal sludge management services: lessons from Bangladesh', Waterlines, 39(2–3), pp. 166–179. doi: 10.3362/1756-3488.20-00002.

4.1 Introduction

As explained in the previous chapter, this PhD is comprised of four cases study; this chapter presents a formative case that investigates the functionality of faecal sludge treatment plants (FSTPs) in Bangladesh. Although this chapter is centred on the FS/WW treatment segment of the SVC, it provides evidence as to the importance of addressing the varying incentives of stakeholders throughout the whole SVC. This finding influenced my decision to systematically address stakeholders' incentives in the following three case studies (Chapters five, six, and seven), within all the services across the SVC.

This study contributes to the first research objective: ***to explore the incentives associated with allocating funds toward sanitation services***; it explores some of the symptoms of the incentives mismatch amongst stakeholders to deliver sanitation services. Although it does not systematically address the second objective: ***to assess how stakeholders' incentives interact with economic characteristics of sanitation services***, this chapter provides evidence that stakeholders' incentives to fund sanitation services interact differently, even for sanitation services with identical economic characteristics, in the four locations of the FSTPs.

The following section provides background about the drivers of success and challenges of operating sustainable FS/WW treatment plants in low and middle-income countries (LMICs), followed by a background about the trend of FSTPs in Bangladesh. I then explain the methodological considerations of the study, the history of the studied FSTPs, current functionality status and context of the four FSTPs, in Jhenaidah, Lakshimpur, Narsingdi, and Chowmuhani.

I then discuss the symptoms of the mismatch of stakeholders' incentives to fund sanitation with external funding, including the lack of integrated planning of sanitation services, unbalanced partnerships, ambiguous roles and responsibilities, and limited financial and technical resources.

4.2 Literature Review

Centralised wastewater treatment plants (WWTPs) have historically been the primary response by governments and international development actors to the issue of unsafe disposal of WW in the environment, which ends up compromising public health including water

quality. These largescale sanitation systems receive substantial investment, including around one billion US dollars a year from official development aid, but show poor levels of functionality in LMICs (WaterAid, 2019b). Acknowledging the fact that most urban dwellers in cities in LMICs are not connected to sewers, over the past decades, faecal sludge treatment plants (FSTPs), which treat the contents of pit latrines and septic tanks, have been increasingly promoted.

Since 2007, several actors have been introducing FSTPs across Bangladesh to address the dumping of untreated faecal sludge in the environment. Between 2007 and 2014, the Government of Bangladesh (GoB) and the Asian Development Bank (ADB) constructed 11 FSTPs in 11 secondary towns. In 2019, according to the Department of Public Health Engineering (DPHE), only five out of the 11 FSTPs were functional. Other FSTPs were built by NGOs, such as Practical Action's FSTP in Faridpur constructed in 2008. The FSTP was shut down seven days after construction completion, when the surrounding communities protested against it, as they perceived it as a health and aesthetic hazard that would devalue their land (Jahan, 2019). In 2017, Practical Action constructed a new FSTP in Faridpur. In 2015, The Stichting Nederlandse Vrijwilligers (SNV) Netherlands Development Organisation a not for profit international development organisation constructed a plant in Khulna city and rehabilitated an existing plant in Jhenaidah (SNV, 2018). Similarly, WaterAid Bangladesh constructed an FSTP in Sakhipur; the plant has been functional since its construction in 2016 (WaterAid, 2019a). These recent FSTPs are still functioning, partly because the NGOs have remained involved in the management and/or operation of the plants to this day (SNV, 2018; Jahan, 2019). But questions remain about the sustainability of these plants once the NGOs leave and hand over the work to local governments.

The existing literature identifies several factors that are key to the sustainability of such infrastructure. First, the appropriateness, inclusivity, scalability, and economic viability of the technical design and operation and maintenance of a FS/WW treatment plant (WaterAid, 2019b). Second, the planning of such infrastructure needs be in line with the broader strategic planning of WatSan at the national and local level (Reymond et al., 2015). A number of scholars have also highlighted other enabling factors for the sustainability of FS/WW treatment plants, for example, Bassan *et al.* and Scharp *et al*. argue that the enabling environment at the national and local level is the driver to sustainable FS/WW treatment plants (2014; 2018). Political will and leadership, particularly, and decentralization at the

national and local levels, are vital to encourage long-term commitment (Reymond et al., 2015).

Moreover, service providers ought to have institutional autonomy over their programmes and resources to deliver efficient decision-making processes, and access to sanitation capacity development and funds (Bassan et al., 2014). The enabling environment can promote partnership among stakeholders including the private, public sector, and users (Reymond et al., 2015; Scharp et al., 2018; Eawag/Sandec, 2019). Schoebitz *et al*. also support establishing partnerships with the private sector, assuming that the presence of a profit-driven service could promote its sustainability (2015).

However, the incentives for the private sector to deliver sanitation are not high compared to other sectors, especially for wholesale services, such as FS/WW treatment plants, that require huge capital investments while not leveraging the short-term revenues desired by the private sector (Ibid). A recent desk review of the sustainability of WWTPs also highlights the importance of skilled human resources to operate and maintain the plants, promote social accountability and participation in the decision-making process as well as its financial sustainability (WaterAid, 2019b). A scoping study of FSTPs in South Asia and sub-Saharan Africa concluded that the key barriers to sustainability are low institutional recognition, insufficient coordination and communication between stakeholders, variability of the quantities and qualities of FS arriving to the FSTPs, and low capacities of operation and management (Kinger et al., 2019).

Focusing on local level leadership, it is important to note that the provision of onsite sanitation services in Bangladesh is the responsibility of local government institutions: city corporations in large cities and municipalities in small towns (Local Government Division, 2017). This builds on decentralization reforms over the past four decades (Panday, 2017). Some argue that decentralization efforts in LMICs, including Bangladesh, aim to increase central government power at the local level rather than increasing the efficiency of the government, which would explain why little actual control and power is handed down to local governments (Panday, 2017). This is the case for the provision of public services in Bangladesh, for which local governments are responsible – according to the 2007 Paurashavas Act (Bangladesh National Assembly, 2010) – but do not have the capacities or even willingness to deliver, given the legal and financial restrictions set by the central government and the heavy central bureaucracy (Panday, 2017). This will likely apply to the provision of onsite sanitation services in municipalities, which do not have earmarked

financial resources and human capacity and would heavily rely on central government support (Local Government Division, 2017).

Globally, there is growing interest by governments and development agencies in the construction of FSTPs. In Bangladesh in particular, there are plans to take FSM to scale by setting up FSM services in over 100 municipalities, including building dozens of FSTPs over the next few years with funding from international finance institutions (Asian Infrastructure Investment Bank, 2019; International Development Association, 2019). It is therefore critical to gather evidence from past experiences and integrate the lessons in future initiatives. While there is considerable documentation of the functioning FSTPs initiated by NGOs, there is no publicly available documentation of the experience from the implementation of the 11 FSTPs from the ADB and GoB project mentioned earlier.

This Chapter assess the functionality of four municipal FSTPs in four secondary towns of varying functionality levels: Jhenaidah, Lakshimpur, Narsingdi, and Chowmuhani in Bangladesh which were funded by the Asian Development Bank through the GoB. The selected four municipalities involved with the FSTPs have varying capacities and governance issues, which sheds light on the various incentives of the involved stakeholders in promoting the sustainability of these plants.

4.3 Materials and Methods

As explained earlier, this chapter presents the formative case study of the thesis; therefore, the research process differed from the following three cases. It also organised the findings into four units of analysis to present a comprehensive picture of each FSTP and allow comparison of the opportunities and barriers to the sustainability of those plants. The selected plants are located in four secondary towns: Jhenaidah, Lakshimpur, Chowmuhani, and Narsingdi. The four FSTPs were selected in coordination with the Department of Public Health Engineering (DPHE) team to ensure representation of the varying functionality. Jhenaidah plant was fully functional at the time of the study, Lakshimpur and Chowmuhani were partially functional, and Narsingdi was not functional. Figure 8 provides the locations of the FSTPs in this study and the remaining plants constructed as part of the same programme.

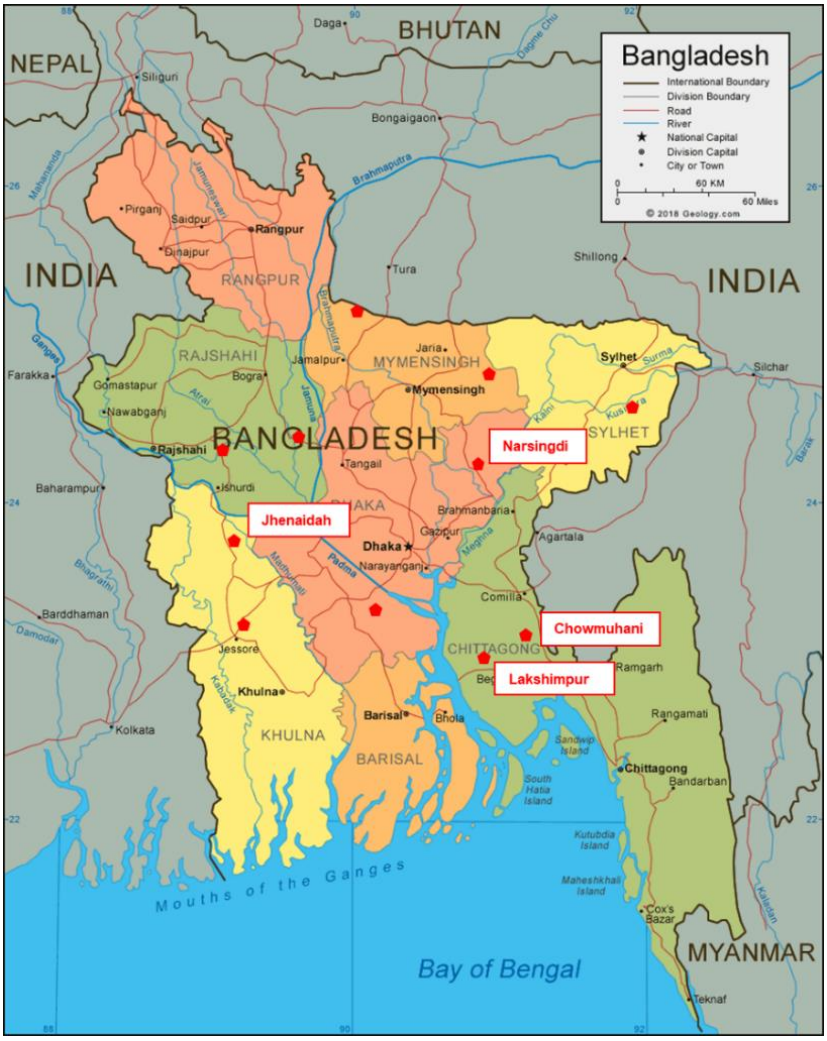

Figure 8: The locations of the 11 FSTPs, reproduced from (Biswas, 2014)

Data collection

This case study builds on published literature and empirical data. The literature review included peer-reviewed literature on FSTPs and sanitation infrastructure sustainability. I also utilised grey literature on the status and implementation of the 11 FSTPs, which was almost non-existent, and policy documents such as the 2007 Paurashavas Act and 2017 Bangladesh Institutional Regulatory Framework (IRF) for FSM in secondary towns (Local Government Division, 2017).

The empirical data collection included in-person interviews with key informants, and plant visits. It took place in April–May 2019, using qualitative interviewing to gain a deep understanding of the status and sustainability of the four FSTPs from the managerial standpoint. In addition, semi-structured interviews were conducted at the national and municipal levels to understand the higher-level coordination and planning processes for such infrastructure. The study concluded with field visits to three FSTPs as the last FSTP was

abandoned entirely, and the research team could not access it due to road disruptions. The study could not cover further FSTPs due to time constraints and the lack of communication between the project team at the DPHE and the municipalities involved. Furthermore, due to time constraints, the research team could not approach the ADB to discuss its views on their execution of the FSTPs construction and management by municipalities.

I developed a list of open-ended questions based on the Terms of Reference agreed with the WaterAid UK Policy Team, attached in ***Appendix 4.1***, to examine the institutional arrangements, human resources available and funding to the four FSTPs, along with the level of community engagement in the towns. The study also explored the overall status of FSM coverage in each town, in order to gain a better perspective of the other contributing factors inhibiting the sustainability of FSTPs. I conducted 11 in-person interviews: with NGO professionals (four), researchers (two), and governmental organisation professionals (five) in addition to (three) in-person group interviews with governmental organisation professionals (each interview included 2-4 persons).

A research assistant was present to assist with interpretation; however, the language barrier limited the depth of the discussion with some interviewees. Since this study is focused on addressing the shortcomings of establishing FSTPs in secondary towns, the research team made sure to build rapport and trust with the interviewees to persuade them to discuss freely the lessons learned from implementing and managing the FSTPs. There was some resistance from some of the interviewees to acknowledging existing problems, to overcome this, I interviewed some members of the local and national government who were aware of the status and history of the treatment plant but are not directly involved in the operation of the treatment plants.

Data analysis

I inductively analysed the interview findings to identify the main themes in the light of the reviewed literature presented earlier. As shown in Figure 9, thematic mapping identified the sanitation issues in each town that impact the functionality of the FSTPs, it also captured the potential funding gaps and conflicting priorities between stakeholders in delivering services across the SVC. I present the thematic mapping in this section as the findings and the discussion are presently differently. The code book of the thematic map is presented in Appendix 3.3 (a) as part of the Research Design Chapter.

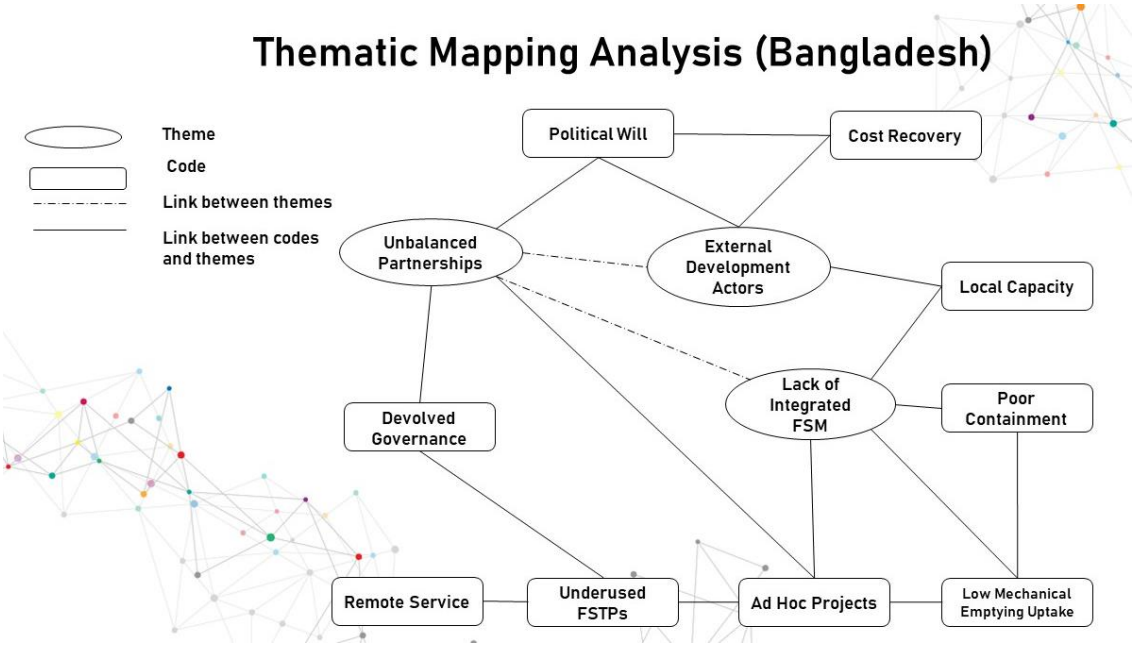

Figure 9: Thematic mapping analysis for the case of Bangladesh (Author's own, 2023)

4.4 The Status of the Four Faecal Sludge Treatment Plants

The construction of the FSTPs was part of the GoB and ADB country-wide project from 2007 to 2014 in secondary towns. The project included capacity building and institutional support to the local and central governments, piped water supply networks, community mobilisation, and construction of private and public toilets (ADB, 2016). The construction of the FSTPs was not part of the original project plan and it was included later as a way to introduce FSTP technology to the country. The project team decided to construct 16 plants in various locations. However, the mayors of five towns refused to collaborate, so the project only constructed 11 plants. The ADB did not publish any documentation regarding the FSTPs, even in the compilation and evaluations reports of the project, hence it is still vague how and why the FSTPs were planned.

The FSTPs were designed to provide basic secondary treatment of partially digested FS received from septic tanks and pit latrines. The sludge unloading chambers screen the sludge and send it to the planted drying beds. The beds, which contain filter media to percolate the water content, are planted with wetland/reed plants (biomass) such as *Phragmites karka*; and have ventilation pipes to prevent anaerobic digestion conditions that harm the plants' roots. The drying beds consume the FS and produce biomass; the percolated water is then transferred to the collection pond using perforated pipes (Biswas, 2014).

The planted drying beds system has several advantages over other treatment systems. It requires minimum operation and maintenance (O&M), since it depends on natural processes

to treat sludge; it does not require an energy source for operation and produces biomass (plants), which can be harvested and consumed; and it does not require constant emptying of the treated sludge – it is emptied once every 6–10 years (Biswas, 2014). The final treated sludge does not require further treatment prior to disposal. This technology requires large spaces, which is not usually an issue in secondary towns since land is often available for low prices (Biswas, 2014). The following sections provide the history, components, and status of the four FSTPs in light of the current onsite sanitation practice in each of the four towns, while highlighting the prevailing stakeholders' incentives and the institutional and financial arrangements in place.

Jhenaidah Faecal Sludge Treatment Plant

In 2012, the Jhenaidah FSTP was constructed to serve Jhenaidah, a secondary town in Khulna Division. In 2011, the town had a population of 110,541 (Bangladesh Bureau of Statistics, 2014). At the time of construction, Jhenaidah municipality owned one Vacutug, a mechanical FS emptying machinery, and since one Vacutug cannot meet the demand, manual pit emptying was the leading emptying method. The plant comprises two screening chambers, five planted drying beds, three unplanted drying beds, and one filter media bed. The treated FS is collected and discharged to a nearby river. From 2012 to 2016, the plant was used for the sole purpose of dumping and storing low quantities of untreated FS; the waste was not being safely treated or disposed of. According to the mayor of the municipality, the plant was only used to store waste due to the lack of knowledge and skills in onsite sanitation management, and in how to operate the plant properly.

Since 2014, SNV has been providing technical and financial support to the Jhenaidah Municipality – focusing on the rehabilitation of the FSTP, providing Vacutugs to manage the emptying and transport of FS, in addition to faecal sludge management (FSM) training and capacity building. By 2016, SNV had completed the rehabilitation of the FSTP, and the municipality was handed the responsibility to manage the plant and the mechanical emptying and transport of faecal sludge in the town. Due to the low demand for FSM services and the lack of revenue, the municipality's sanitation expenses exceeded revenues in the first year, which resulted in a loss of around 200,000 BDT (USD 2,350). The municipality then decided to reach out to AID Foundation in 2018, a local NGO, to help manage all the FSM services in the town through a 3-year concession agreement. The WASH committee, created by the NGO, is responsible for the onsite sanitation services including FS emptying and transport. AID Foundation works collaboratively with the municipality and SNV to address any

challenges related to onsite sanitation services through regular meetings. The cost recovery of the onsite sanitation services is gradually being achieved thanks to the growing awareness of, and demand for, the FS emptying and transport service. AID Foundation aims to achieve financial sustainability by introducing a co-composting component for the FSTP and then sell or use its products. SNV is helping AID Foundation in this by funding an action-research project with the Bangladesh Agricultural Research Institute (BARI) and the National Agricultural Research Organization under the Ministry of Agriculture.

Lakshimpur Faecal Sludge Treatment Plant

In 2012, the Lakshimpur FSTP was constructed to serve Lakshimpur, a town with a population of 262,997 (2011) in Chittagong Division (Bangladesh Bureau of Statistics, 2014). The plant comprises two screening chambers, two planted drying beds, and a nearby dumping pond, and has been partially functional since its construction, under the management of an Executive Engineer and a Slum Development Officer. The quality of the effluent is tested yearly by DPHE and the International Training Network of Bangladesh at the Bangladesh University of Engineering and Technology (ITN-BUET) to ensure the safe dumping of FS in the surrounding environment. There are no operators or guards at the plant, as the municipality presumes it does not require daily O&M activities. The mayor is keen to ensure the success of the FSTP; in 2017 he authorised the construction of an access road to ease the transport of the Vacutugs to and from the plant – the cost of building this road was covered by the municipality's businesses (commercial centre and lands rental) and taxes.

The DPHE considers the Lakshimpur FSTP a success story as no technical issues have been reported and it is independently managed by the municipality. However, the plant receives much less sludge than it was designed for, since the municipality only carries out pit emptying services twice a week, and is therefore underused.

Narsingdi Faecal Sludge Treatment Plant

In 2013, the Narsingdi FSTP was built to serve Narsingdi, a secondary town with a population of 185,128 in the Dhaka Division (Bangladesh Bureau of Statistics, 2015). The plant was initially comprised of two planted drying beds and a nearby dumping pond. The plant is still under the management of Narsingdi Municipality, but it is abandoned and damaged. Since the completion of its construction, the plant itself has never been operational, for technical and political reasons. At the time of the FSTP's construction, the town did not have appropriate on-site sanitation facilities. According to the municipality, the pit latrines and septic tanks were poorly built structures; the waste would leach into the ground and

therefore FS was never emptied and transported to the FSTP. One year after the plant's construction, a Vacutug was introduced to Narsingdi for drains cleaning. However, the use of the Vacutug, and the management of FS in general, is still not widespread, despite the well-developed infrastructure and accessible transportation systems.

The municipality staff did not receive any FSM training or partake in any FSM sensitization workshops prior to the plant construction, so they also lacked the required technical expertise to run the plant. More importantly, the mayor was not willing to cooperate with the DPHE when the FSTP was constructed, as he did not consider the plant to be a priority for the town. Although the DPHE office at Narsingdi offers services in WatSan and is eager to rehabilitate the plant; the management and decision-making process is controlled by the municipality itself. The municipality does not collect sanitation or water taxes, since it does not provide sanitation services and only covers 40 per cent of the town's water supply. Manual pit emptying is the common practice for onsite sanitation in the town, and the plant's location is not accessible for manual pit emptiers to transport the FS.

Chowmuhani Faecal Sludge Treatment Plant

The Chowmuhani FSTP was built towards the end of the ADB and DPHE project in 2014 to serve Chowmuhani, a secondary town in Chittagong Division with a population of 132,948 in 2011 (Bangladesh Bureau of Statistics, 2014). The plant comprises two planted drying beds and two screening chambers. The plant remains out of operation because of mobility constraints. The municipality reached out to the ADB and DPHE after the construction of the plant to gain support in the construction of an access road, but they were not able to fund it. Hence, the municipality took the responsibility to construct the road, but this did not happen quickly due to other priorities and lack of funds. In 2018, the newly elected mayor instigated the construction of the plant access road.

Since the plant was constructed at the end of the ADB project, the municipality staff did not have the opportunity to attend the FSM training and sensitization workshops, affecting the uptake and operation of the plant. The plant is currently under the supervision and management of the Slum Development Officer, who oversees all sanitation-related affairs in the municipality. The officer has had no prior training in FSM or sanitation. Recently, the municipality staff have been attending FSM training workshops run by the DPHE. In addition, the household demand for pit emptying services is low due to the lack of awareness and high cost of the Vacutug services. As a result, the municipality empties around seven

household septic tanks a month, and the plant is underused. Nobody operates the plant, given it has reportedly not required any desludging or maintenance to date.

Despite the varying statuses of the four plants as shown in Figure 10 -12, there are several common factors contributing to their functionality, presented in Table 3.

Figure 10: Jhenaidah Faecal Sludge Treatment Plant

Figure 11: Lakshimpur Faecal Sludge Treatment Plant

Figure 12: Chowmuhani Faecal Sludge Treatment Plant

Table 3: The FSTPs level of functionality and key factors

Town (year of construction)	***Functionality***	***Key factors***
Jhenaidah (2012)	Functional since 2016	Technical support from INGO increased the capacity of the municipality Operation by an NGO via 3-year concession agreement increased the management efficiency WASH committee to coordinate FSM services clarified resourcing and responsibilities
Lakshimpur (2012)	Partially functional	Ownership by the mayor helped mobilize resources from the municipality and the community to build access road

		The plant is underused due to low volumes of FS, linked to irregular emptying and transport Untrained staff and irregular maintenance
Narsingdi (2013)	Not functional	No interest in operating the plant from the municipality Leaching front-end containment infrastructure (i.e., pits and septic tanks) mean infrequent emptying and no FS reaching the FSTP Demolished and neglected infrastructure
Chowmuhani (2014)	Partially functional since 2018	Lack of access road until 2018 hindered operations The plant is underused due to low volumes of FS, linked to irregular and expensive emptying and transport Untrained staff and irregular maintenance

4.5 Discussion

As the literature suggests, the success and sustainability of a project depends primarily on comprehensive planning and management, which ideally need to be present right from the start of a project (Reymond et al., 2015). When looking at the four FSTPs, the planning and management of the projects were inadequate. According to the DPHE, the plants were not considered at the design stage of the project with ADB, but introduced later on to stimulate dialogue and efforts to prioritise FS treatment in the country. Moreover, the project did not consider the whole SVC. The onsite sanitation service in the four municipalities of the FSTPs consists mainly of mechanical emptying and transportation, and reaching a small population (Biswas, 2014), in addition to managing the FSTPs, has brought many problems. In Narsingdi, for instance, low demand for mechanical emptying services and prevalence of manual emptying contributes to the varying quantities and qualities of FS which correlates with Kinger et al.'s (2019) conclusion that this is a main reason for failure of FSTPs in South Asia. As a result, the plant is not in use and septic tanks and pits are emptied irregularly, with the FS dumped in nearby water bodies or drains instead (Local Government Division, 2017). This correlates with the desk review findings: social inclusion and accountability to the community are crucial for the sustainability of a treatment plant (WaterAid, 2019b).

Linked to the planning issues highlighted earlier, decisions were made exclusively by the central project team at DPHE and therefore the municipalities were not involved until the implementation phase. There was also ambiguity regarding the roles and responsibilities of the involved stakeholders. The municipalities thought the ADB and DPHE were responsible for the construction of the access roads to the plants – whereas the DPHE believed this was to

the responsibility of municipalities. A municipality officer from Chowmuhani mentioned ‘we reached the DPHE and the evaluation team of ADB who visited the project after completion to construct approach road but they refused because it was not part of the project items and no fund available for it’. This delayed the start of FSTP operation for four years in Chowmuhani; a similar scenario happened with Lakshimpur FSTP. Building partnerships and collaboration among relevant stakeholders is a key to sustainable management of sanitation infrastructure (Reymond et al., 2015; Scharp et al., 2018; Eawag/Sandec, 2019).

It is worth noting that at the time of construction, FSM was not formally part of the legal duties of municipalities (Bangladesh National Assembly, 2010). The recently developed IRF for FSM at municipalities levels has made considerable steps in clarifying the roles and responsibilities of the government and partners institutions at the start of projects (Local Government Division, 2017).

Poor involvement of municipalities has resulted in a low level of ownership from the municipalities towards the FSTPs. Mayors from some of the originally selected municipalities refused to accept the construction of FSTPs in their towns. The other mayors simply accepted the construction of the FSTPs, but did not consider them a political priority, including the development and support of other FSM services in their towns. The current mayors of Jhenaidah, Lakshimpur, and Chowmuhani show a more positive involvement in FSM as they are constantly attempting to improve the FSM services in their towns. This attitude is a result of the political position of the mayors and their interest in becoming sanitation champions and being acknowledged by the central government. Whereas in Narsingdi, this is still lacking as a central government employee in Narsingdi highlighted: ‘the mayor prefers investing in road and drain infrastructures, issues more frequently requested by his communities, and that can help him to gain votes and get re-elected’. It is evident from the four FSTPs that the political will of a mayor in a secondary town is crucial to the success of any utility project. This correlates with findings of a similar study in Egypt by Reymond et al. (2015).

In order to achieve sustainable management of any service or infrastructure project, the service provider, in this case the municipality, should possess the required technical and financial capacities (Bassan et al., 2014; Kinger et al., 2019). The municipalities at the time of construction, however, lacked the technical and financial capacity to provide FSM services sustainably. First, the municipalities’ staff are not trained in FSM and do not have the relevant skills and experience to manage FSM and do not focus on FSM services. This is seen as

secondary to many other tasks including solid waste management or even slums development (Biswas, 2014).

Second, the financial resources of most of the municipalities are limited, and designated for other activities, so they cannot fully finance the provision of FSM services without support from other institutions. As mentioned earlier, this is related to weak fiscal decentralization, whereby municipalities' financial sources and decisions are fully dependent on central government institutions such as DPHE, and lack the autonomy to access internal and external funds to cover O&M and further investments in FSM (Bassan et al., 2014; Panday, 2017). It is worth mentioning that recently the IRF-FSM stated that municipalities are entitled to receive substantial funds from the government to cover capital expenditures in FSM (Local Government Division, 2017); however, the interviewees did not mention receiving any funds from central government for FSM; this may change in future efforts.

The fact that the FSTP in Jhenaidah is fully functional is closely related to the collaboration with SNV, which has been providing technical and financial support and created a linkage with a national NGO that has taken over FSM service provision. The engagement and support of an international NGO and private service providers are common elements of the current, well-functioning FSTP in Jhenaidah, and FSM services in other towns in the country, including those mentioned in the introduction. This shows how such partnerships are crucial to sustainable sanitation programmes (Reymond et al., 2015; Scharp et al., 2018; Kinger et al., 2019).

There are, however, challenges to the successful involvement of private service providers in secondary towns, such as the capacity to make any investments beyond the regular running costs and the fact that they receive little support from research and government institutions, leading to dependency on international NGOs. This finding correlates with Schoebitz et al.'s (2015) argument that the private sector alone cannot offer a financially sustainable business model for FSM.

Interviewees also highlighted that academic and research institutions, such as Khulna University of Engineering & Technology (KUET), have recently played an important role in promoting FSM across Bangladesh. In addition, the Bill & Melinda Gates Foundation has funded a two-year capacity building project run by DPHE, in partnership with ITN-BUET, to tackle the FSM knowledge and skills gap. Although capacity building is important, clear

financial planning for FSM and crowding of funds toward it should be in place to make use of these capacity building efforts. Conclusion

The sustainability of sanitation projects in Bangladesh is not guaranteed by the incentives of stakeholders alone. To increase sustainability, it is necessary to implement incentives such as the creation of sanitation champions and the monetization of sanitation services and wastewater reuse products at the local government level. This case study, which focuses on the implementation and operation of FSTPs in four secondary towns in Bangladesh, found that the provision of essential services like faecal sludge containment, emptying, and transportation is crucial for the success of FSTPs. Additionally, involving service providers (municipalities) in the decision-making process from the start is important for ensuring ownership of the project and the political will to provide and maintain it. Finally, the technical and financial capacities of municipalities must be sufficient to meet the O&M requirements of these services. In some cases, the support of international and local NGOs has helped to address any gaps in capacity and promote the good performance and sustainability of treatment plants. In the following three case studies I build on the incentives issue concluded from this case study as stakeholders' incentives is a key building block to setup appropriate financing and capacity building programmes throughout the SVC.

Chapter Five: Market-based sanitation: Sanergy as a case study

5.1 Introduction

As the case study of providing municipal onsite sanitation in Bangladesh in Chapter four highlights how the mismatch of incentives amongst sanitation stakeholders undermines the sustainability of sanitation service, I continue to examine incentives in different service provision arrangements throughout the next three chapters. I employ the literature of service economic characteristics, as elaborated in Chapters two and three, to engage methodically with incentives. This chapter discusses the incentives issues in the case of several stakeholders including non-governmental organisations (NGOs) in providing sanitation services in low-income settlements (LISs). I used the experience of Sanergy, an NGO with ambition to become a social enterprise that deliver a circular economy for offsite sanitation services to LISs in Nairobi, Kenya.

The chapter contributes to the first research question: ***What are the incentives associated with allocating funds toward sanitation services?*** It explores the incentives in the context of privately provided sanitation in the LISs of Nairobi. The Chapter also contributes to the second research question: ***How do stakeholders' incentives interact with the institutional and economic characteristics of sanitation services?*** in the mentioned context**.** I analyse the economic characteristics of Sanergy's service within the current political, social, and economic context in Nairobi. I then discuss the different incentives of the key stakeholder: users, operators, Sanergy and the Nairobi City County (NCC) to fund the three segments of Sanergy service. This analysis is crucial to understanding the financial (un)sustainability of market-based sanitation in LISs.

As Sanergy promotes market-based sanitation, using it as a case study contributes to the ongoing debate on privatising basic services. It sheds light on the barriers and opportunities of privatising sanitation services especially in LISs settings. The following section provides background about sanitation in Kenya, focusing on Nairobi's LISs, where Sanergy started operation. I then explain the materials and methods used in the study, followed by a diagnostic of Sanergy's services, including an analysis of their economic characteristics and how they interact with stakeholders' incentives to fund it. I then discuss the implications of incentives mismatch where I argue that market-based sanitation requires sound and active participation of the state throughout.

5.2 Literature Review

Kenya is a middle-income country that is rapidly urbanising. Although the new Constitution in 2010 acknowledged the universal right to reasonable sanitation standards as part of adequate housing, progress is modest (Article 43, Government of the Republic of Kenya, 2016). In 2020, 33% of Kenya's population had access to at least basic sanitation, and 62% had access to at least basic drinking water (UNICEF/WHO, 2021). The national government's investment toward WatSan is marginal. Between 2014 and 2018, only 1.4% of the government's expenditure went to WatSan, and 91.8% of that went to water resources infrastructure such as dams and tunnels (Development Initiatives, 2018).

Underfunding sanitation is potentially a result of the fragmented responsibilities toward sanitation in Kenya. At the national level, the responsibility is divided between the Ministry of Health (MoH) and the Ministry of Water and Sanitation (MoWS), while their mandate is not clear and lacks coordination (Government of the Republic of Kenya, 2016). At the local level, the new Constitution has introduced a devolved governance structure where the 47 new county governments are responsible for sanitation provision and are mandated to make a practical shift to accelerate access to sanitation (Government of the Republic of Kenya, 2016). However, the new governance arrangements are still ambiguous, disconnected from implementation capacity and do not enforce sanitation as a priority for the county governments. For example, the Nairobi City County (NCC) briefly mentions sanitation in its latest published budget document, including the need to prioritise pro-poor service. However, it does not allocate a budget for expansion of the current sewer network or for sanitation alternatives for the poor (Nairobi City County, 2020). Slow absorption of funds is another barrier to progress in WatSan provision. In 2015/16, the MoWS only used 43.1% of its budget, with a slight increase to 68.5% in 2017/18. This slow use of funds is due to the slow disbursement from the national government and lengthy procurement process (Development Initiatives, 2018).

Kenya's long-term goal is to adopt sewered sanitation across the country. However, sewer network coverage dropped nationally from 8% in 2000 to only 6% in 2020, while on-site sanitation is expanding in rural and urban Kenya (WHO/UNICEF, 2019; UNICEF/WHO, 2021). Expanding sewer networks is especially problematic in LISs where their exclusion from public services has persisted since the colonial period. Sewers were a 'sanitary buffer' constructed to serve the colonial elites and separate them from the native population, especially the poor, who had to find other sanitation options (O'Keefe et al., 2015). Around

15% of Kenyans reside in LISs, where residents have limited access to basic services (Mansour, Oyaya and Owor, 2017). The national government introduced a pro-poor agenda as part of the 2002 Water Act and created the Water Sector Trust Fund to finance pro-poor WatSan projects in LISs (Harper, 2014). However, the Fund relies on external contributions, which undermines its sustainability. In 2016 62.9% of the Fund was from external donors (Development Initiatives, 2018).

Sanitation in Nairobi's Low-income Settlements

The largest LISs in Kenya are in the capital city Nairobi. Here residents of LISs have limited access to sanitation, despite being within the service area of the city sewer network. The Nairobi City Water and Sewerage Company (NCWSC) runs the sewer network. In 2009 NCWSC created an Informal Service Department (ISD) to extend WatSan services to LIS residents. The department was mainly created to reduce the non-revenue water[5] in LISs but later expanded its mandate (WSUP, 2018). In sanitation the ISD helps landlords to convert their pit latrines to pour-flush toilets and install connections to the existing sewer network (NCWSC, 2022). However, progress is slow. NCWSC are still reluctant to install fixed infrastructure, such as sewer connections, in LISs because such settlements are considered illegal and have associated land tenure issues (WSUP, 2018; World Bank, 2019a). Attracting private investments for LISs is also limited by the legality issue, in addition to the technical and financial challenges of offering sanitation to dense and unplanned urban areas (Scott, Cotton and Sohail Khan, 2013; O'Keefe *et al.*, 2015).

Power relations in LISs can be barriers or enablers for extending public services. In the electrification process of the LIS Kibera in Nairobi investors had to contend with 'cartels,' comprised of local individuals who have strong ties with political leaders and are capable of influencing the social and economic activity of their localities, who ended up making illegal electricity connections to the network and reselling them to individual households (HHs) in the community as their clients (Bercegol and Monstadt, 2018). In sanitation, cartels pose a threat and interfere with the work of pit emptiers by stealing their money and charging them for dumping FS in water bodies (Mallory *et al.*, 2020). Cartels also vandalise sewer trunks and transfer stations as they perceive those arrangements to disrupt their money levy from the residents of LISs (Ibid).

[5] Pumped or produced water that is subsequently lost (e.g., leakage) or unaccounted for in the system.

Residents of Nairobi's LISs are mostly tenants in housing blocks. The normal arrangement is that each block has a toilet facility (a shared pit latrine) provided by the landlord as part of the tenancy agreement. Maintenance of the latrine is organised between the tenants and the landlord. The landlord organises the faecal sludge emptying, without extra costs to tenants, by hiring a pit emptier who desludges the latrine manually or, in some cases, mechanically, and dumps the excreta in a nearby water body (World Bank, 2019a). HHs within blocks who wish to have a private facility negotiate with their landlord, but landlords are mostly unwilling to invest in such infrastructure (Scott, Cotton and Sohail Khan, 2013).

Some tenants also pay a fee to use pour-flush public toilets provided by the government and managed by CBOs or NGOs (van Welie *et al.*, 2018). According to a World Bank report, public toilets operators do not have strong economic incentives to maintain the facility as they only receive a fraction of the generated revenue (World Bank, 2019a). Pour-flush toilets are connected to the sewer network provided by the NCWSC, treated in the Dandora WWTP, and the treated WW is released to the adjacent river (World Bank, 2019a).

Finally, there is also a privately operated container-based sanitation service (CBS) offered by Sanergy, a self-styled social enterprise. Sanergy has worked in Kenya providing CBS toilet facilities operated by individuals or institutions since 2010 (World Bank, 2019a). If none of the mentioned options is available, tenants resort to open defecation (e.g., flying toilets); a wide spread practice in the country.

In summary, sanitation services in LISs and throughout Nairobi involve heterogeneous services. There is little evidence that the NCC engages meaningfully with the current service providers. As mentioned earlier, the national government and county governments hope to shift to a homogenous, large, and centralised sewer infrastructure.

The failure of states to fulfil their promises for universal sanitation has also invited the private sector to become a key stakeholder in sanitation service provision. Besides, the appetite of the private sector to provide sanitation in low-income urban settings has been increasing following the global trend of promoting innovation in technology, financing, and service provision. Batley and Harris argue that incentives to provide public services such as sanitation are *"a product of the service itself*" and it is crucial first to unfold the characteristics of the service and then explore how they influence stakeholders' incentives (2014, p.7). This chapter utilises Sanergy's operations in Nairobi, Kenya as a case study to enable analyses of actual service and the incentives around it. Despite its small-scale

operation compared to other providers, Sanergy provides an example of the interaction between foreign service providers backed by philanthropists; the served population and its governmental organisations. It also allows us to explore the key incentives challenges when providing safely managed sanitation throughout the SVC in light of scarce public resources and budgets allocated toward sanitation.

5.3 Materials and Methods

This study uses an analysis of the economic characteristics of the services provided by Sanergy to better understand the incentives of stakeholders. I use a case study methodology as the service characteristics are inherently changeable (Batley and Harris, 2014), and should be understood within a specific context (Smith, 1988; Yin, 1994; Christie *et al.*, 2000; Patton, 2002). The case study methodology also enables rigorous examination of the specific sub-services of Sanergy (Patton, 2002). The following sections complement the Research Design Chapter by providing a detailed account of the research methods in this case study.

Data Collection

The study utilises literature and triangulates it with empirical qualitative data for analysis. I conducted a systematic search in January 2021 to ensure comprehensive coverage of all published literature about Sanergy and sanitation in Kenya using Scopus, Web of Science and Google Scholar, in addition to resources of specialised websites such as Engineering for Change. The search resulted in 19 documents being included, covering both technical and political economy studies. I also conducted a series of online semi-structured interviews with the Sanergy team (six interviews) and political economy and WASH experts (five interviews). The interviewing started in May 2021 and ended with a final debrief meeting with Sanergy in March 2022, see the Research Brief presented to Sanergy in **Appendix 5.3** .

The interviewees were selected purposively to discuss the key topics related to the service characteristics issues explained in the next section. The interviews with Sanergy were decided based on the area of expertise available from Sanergy's staff that resonates with the service characteristics framework. For the marketing employee, I designed the research guide to explore their marketing strategies and how Sanergy employ the visibility of their services to attract more users and partners (including Nairobi City County). I have also tried to understand how they perceive the added value of Nairobi City County in their future marketing plans.

For the strategy, government relations and affairs and the communications and external relations personnel, I have explored their approach to get the buy-in from the NCC and philanthropic donors to understand which service characteristics related to their services appeal to Sanergy and their partners. I mostly used semi-structured interviews to capture relevant issues that I might have missed. The questions also prompt discussion about the fund's allocation interests from Sanergy's perspective and based on their interactions with the NCC, philanthropic donors and other partners, which relates closely to my analysis of the nature of good, externalities, and political incentives related to targeting a set of beneficiaries. I also asked about the priority issue for Sanergy to appeal as a contractor to the government, which opens the discussion about autotomy, monopoly, information sharing, and economy of scale.

For the operations personnel, I tried to ask questions about the arrangements and relations between Sanergy staff, potential and current clients (landlords), the users of the services and operational staff (for the FS collection and transport). This helped explore the priority issues and incentives for the different stakeholders in being part of this service (for example, the private and public gains, access to information, access to a competitive market, and autonomy). Similarly, the interviews conducted by the local consultant revolved around the same topics I discussed while interviewing Sanergy's staff but the perspective of partners of potential partners of Sanergy.

A local research consultant conducted in-person interviews with key stakeholders including governmental organisations (three interviews), local NGOs (two interviews) and Sanergy potential customers and workers (four interviews) in July 2021, see the Terms of Reference in **Appendix 5.2** prior to conducting the interviews, I briefed the local consultant on the data protection and ethical considerations of the study, and I had several discussions with her about the key topics. The research consultant is also an established researcher both in the UK and Kenya which also provided confidence regarding her research practice. Collaborating with a local research consultant was crucial due to the travel restrictions imposed due to the COVID-19 pandemic. **Appendix 5.1** provides a list of the interviewees.

Data Analysis

It is the premise of this study that the economic characteristics of sanitation services are pivotal to the incentives of stakeholders to fund or operate services. Data analysis is primarily based on the available literature and was complemented by the interviews. The study first thematically analysed the research data as shown in Figure 13 to draw the relationship

between the opportunities and barriers of scaling CBS offered by Sanergy Enterprise in the LISs of Nairobi. The thematic mapping identified the potential funding gaps and conflicting priorities between stakeholders in delivering sanitation. I present the thematic mapping in this section as the findings and the discussion are presently differently. The code book of the thematic map is presented in Appendix 3.3 (b) as part of the Research Design Chapter.

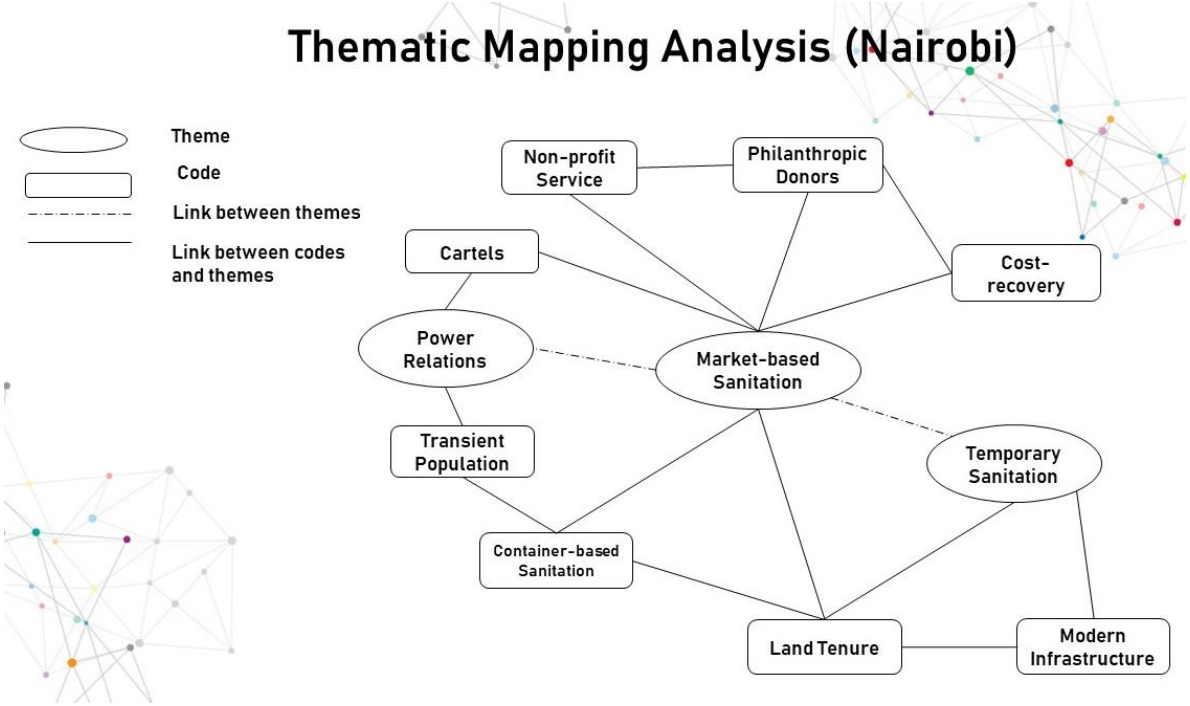

Figure 13: Thematic mapping analysis for the case of Nairobi (Author's own, 2023)

Secondly, I analysed the economic characteristics of the services offered by Sanergy, such as the nature of goods, monopoly tendency, and positive externalities, building on institutional economics literature (see for example Cornes and Sandler, 1986; Ostrom and Ostrom, 1980), as explained in Table 4. The incentive analysis included the main stakeholders involved in Sanergy services; Sanergy, toilet users and Fresh Life (FL) operators, explained below, and the NCC.

The service characteristics analysis addresses the provided service and the stakeholders in a more classic way of understanding SVC services, which might not reflect the arrangements that Sanergy adopts. For instance, I separately analyse the containment segment and the collection and transport, while Sanergy deals with them as one inseparable segment. Also, the toilet users do not contribute to the service based on the current arrangement. However, I included users in the analysis to understand better their current and potential roles in service provision. Eventually, it helped derive in-depth insights about the service and the issue of

incentives for potential changes to the service arrangements, to enable the reader to reflect on the implications of this discussion for other contexts.

Table 4: Definition of key institutional and economic characteristics of basic services

Characteristic	***Definition***
The nature of good	is defined by its excludability and rivalry. Excludability is the ability to deny non-payers access to a service (Ostrom and Ostrom, 1980; Cornes and Sandler, 1986) and rivalry is when consuming a good/service by an individual subtracts it from others (Cornes and Sandler, 1986).
Monopoly tendency	of a good occurs when the technical and financial requirements of providing it pose entry barriers to small providers and support single provider markets (Nauges and van den Berg, 2007).
Positive and negative externalities	are the benefits or costs to a third party that are not reflected in the market price of a service (Hyman, 2011).

5.4 Sanergy Sanitation Service

This study focuses on the mandate of Sanergy in Nairobi, where they operate in Mukuru and Mathare settlements, both within the service area of Nairobi's sewer network. Sanergy provides services across the SVC – containment, collection, transport and treatment (Auerbach *et al.*, 2020). Although Sanergy is applauded by organisations such as the Container Based Sanitation Alliance for adopting a comprehensive model for sanitation, according to Auerbach *et al.* investors were reluctant to fund/invest since it looked 'a complicated venture' of profit and non-profit business models (2020). Therefore, Sanergy has split its enterprise into two entities. The non-profit entity – Fresh Life – provides access to shared toilets – Fresh Life Toilets (FLTs) – and faecal sludge collection and transport for the connected residents. The non-profit's work provides a rationale to philanthropic donors, of achieving social returns by providing affordable sanitation to the poor (Ibid). The potential of the for-profit entity is meant to provide guarantees to attract private investments (Ibid). The profit-generating company (Sanergy Limited) treat the collected faecal sludge and manufacture reuse products. The company aspire to recover costs of the non-profit entity and potentially generate revenue from their treatment and reuse business (Ibid).

Fresh Life Toilets

The Fresh Life initiative provides access to FLTs (known as Fresh Fit toilets when within individual HHs) through contracting FL operators. The service adopts onsite container-based sanitation using urine- diverting technology, as it is deemed appropriate to ease the removal and transport of excreta in dense unplanned urban areas (Auerbach, 2016). Sanergy produces prefabricated toilets whose walls are assembled at the final location (Ibid). Originally, FLTs could be bought, or leased on a monthly subscription, although only the subscription arrangement is now available. When leasing an FLT the operator pays a 8.5 USD monthly subscription for renting the facility. The costs of collection and transport (C&T) are included (Ibid).

To promote uptake of FLTs the Sanergy sales team go to the community and talk with community members (mostly landlords) to convince them of the importance of sanitation and the viability of the FLTs. Upon securing interest, Sanergy and the new operator sign a franchise agreement to buy or rent the facility and agree on the operation and maintenance arrangements (Sanergy Staff #4, 25.06.21). Once signed, Sanergy transport the material and install the facility within two days (Ibid).

The contracted operators must have ownership of the land or formal access (e.g., allotment by the government). Sanergy can assist them in approaching the county government to get the allotment (Sanergy Staff #3, 24.06.21). The credit team assess their ability to pay for the service. Currently Sanergy targets landlords mainly since they have stable monthly income (rental fees from the tenants) and some schools (as they collect school fees) (Ibid). The FL operators have access to interest-free financing coordinated by Sanergy from Kiva (online micro-lending platform) to cover the upfront payment (Sanergy Staff #3, 24.06.21).

Sanergy recruit and contract FL operators with four different target customer types as follows (Auerbach, 2016; World Bank, 2019a):

- Commercial public toilets where the user can either pay per use or a monthly subscription.
- Institutional toilets such as schools; the service fees from students are collected as part of their school fees. In some cases, the toilets are made accessible to the public subject to them paying access fees.

- Residential toilets managed by landlords, the toilet is installed nearby the residences, the HHs might pay fees as part of the rent; some landlords do not increase the rent to incentivise tenants to remain in the housing. Similar to the institutional arrangement, the landlords sometimes choose to allow people beyond the HHs to use the toilet and they pay per use or by a monthly subscription.
- In-home Fresh Fit toilets for use by individual families, where the waste is collected by manual pit emptiers who safely discharge it in the transfer station for it to be transported to the treatment plant.

Currently, 80 % of the FL operators are landlords who lease the facility. According to the Sanergy strategy team in their interviews, at the beginning Sanergy targeted entrepreneurs (commercial public toilets) but pivoted to targeting landlords as there was an intention to increase access through serving housing blocks (Sanergy Staff #5, 30.06.21).

The Sanergy customer support team provides training and operational support to the FL operators to meet quality standards (Ibid). The training includes how to use and maintain the facility, managing finances, and instructions for how to raise complaints via the mobile service run by the logistics team (Ibid). Operational support includes frequent collection and transport of the full excreta containers to the transfer station and their replacement with fresh ones, as well as cleaning the toilet during the C&T visit (Ibid). Pre-COVID 19, the customer support team held forums for the FL operators to share updates about work, deliver talks by public health experts, provide training (e.g., how to make soap) and do health checks (Ibid). Currently, an SMS based platform is used to report issues of complaints by FL operators and users (Ibid).

The price charged to users of the FLTs is left to FL operators to decide. In general it is similar to the fees charged by non-FLT providers for toilet/latrine use; this is probably so that providers can attract customers who are unwilling to pay more for the higher quality of service (Grinnell College, 2014). Landlords usually do not explicitly pass on the cost to their tenants, providing the service to retain tenants (Sanergy Staff #6, 15.10.21).

Each FLT typically serves four families or 34 people. Most FL operators choose to manage more than one toilet to increase their income (Auerbach, 2016). The FL operator manages the facility, he/she provides access, collects entry fees, maintains cleanliness of the facility, and ensures the availability of water, soap, toilet paper and sawdust for users (Grinnell College, 2014). Besides constructing FLTs, Sanergy also offers a service to convert existing pit

latrines to FLTs. The cost is double the cost of constructing FLTs from scratch, but targets a bigger market (World Bank, 2019a).

Faecal Waste Collection and Transport

Sanergy employs a logistics team who are responsible for collection and transport (C&T), This involves replacing the full containers of the FLTs with empty ones and transporting the full containers to a transfer station using a truck or tuk tuk (World Bank, 2019a). The solid faeces are consolidated in large drums at the transfer station (1 drum per 10 toilet containers) and then transported by exhauster trucks to the treatment plant (World Bank, 2019a). The liquid waste (urine) is collected and dumped into nearby sewers since it is currently not financially viable to reuse it (World Bank, 2019a). The C&T of the containers was initially daily. Since 2016 C&T has been based on the demand patterns of the FLTs (e.g., every other day for some, daily for schools) to improve operational efficiency. The network of transport, collection points and transfers stations is created and modified regularly to reach optimal efficiency, especially with the increasing coverage of the FLTs (World Bank, 2019a).

The C&T service is coupled with the FLTs segment; the FL operators are obliged by their contract with Sanergy to coordinate with each other for the collection service. The C&T service is also offered to the owners and operators of other facilities such as pit latrines, for a fee. Based on an interview with a landlord who owns pit latrines, these operators tend to only empty their facility when it is nearly full. This implies that there is no regular/planned collection from non-FLTs toilet operators and currently limited potential to recruit more subscribers beyond the FLTs for the collection and transport service (14.10.21).

Faecal Sludge Treatment and Reuse

The treatment plant is located outside Nairobi City (in Machakos County – about 35 kilometres from Nairobi) on land leased from the government. The treatment uses aerobic composting of faecal sludge to produce black soldier fly larvae - high-protein livestock feed-, organic fertiliser, and biomass briquettes. Besides treating faecal sludge, Sanergy also collects organic waste from various institutions (including slaughterhouses, hotels and public offices) to increase the yield of their reuse products. Sanergy reuse products required massive marketing efforts to convince the public to use since chemical fertiliser is cheaper, although Waldman-Brown and Campbell Flatter argue that Sanergy offer high yield in the short run and better soil quality in the long run for their organic fertilisers (2018). The acceptability of the reuse products was a barrier highlighted by an interviewee from the Ministry of MoWS to the profitability and scaling of the treatment segment of Sanergy's service.

The Nairobi City County only provides support on the regulatory aspects of the service. The trucks and tuk tuks used to transport faecal waste and the treatment facility are licensed by the National Environment Management Authority (NEMA). The hand carts and the collection centres are not licensed yet and there is informal agreement between the NCC and Sanergy that they will meet the environmental impact assessment standards in the future.

Sanergy recovers 19% of its costs, depending on philanthropic grants to cover the financial gap (World Bank, 2019a), and hope to eventually receive a subsidy from the NCC. However, such a subsidy may not eventuate due to the competing priorities of the NCC and other stakeholders and their incentives to engage with Sanergy and the private sector.

5.5 Sanergy Service Characteristics

The FS treatment infrastructure is a natural monopoly that requires high capital costs that the private sector cannot afford to provide without subsidies. It is a public good with positive externalities, and in a free market, the private sector would underfund it. In theory, the NCC should be incentivised to provide the treatment service since it affects public health and the environment. However, there is no evidence that the county would provide enough of these treatment plants. For this reason, Sanergy runs their FS treatment and reuse business under the Sanergy Limited Company. The treatment plant accepts FS free of charge from the FLTs, and organic waste is collected from slaughterhouses, hotels, and government offices to produce the reuse products.

The sale of reuse products to local farmers is the only potential revenue stream for the treatment service. Sanergy does not collect treatment fees from the waste generators since the treatment does not have any private value for the FL operators and the other waste generators (whether the waste is treated is not of private value to them, only that it has left their premises). In most contexts, citizens do not willingly pay for a public good such as FS treatment; they would potentially pay if the government enforced regulations and taxes for individuals to cover it. The imposition of treatment fees would require the intervention of a regulatory body. It might have the negative effect of slowing FS collection and subsequently slowing the generation of reuse products.

So, for the treatment plant to increase production, Sanergy has to increase FS collection and transport. Currently, the sale of the reuse products does not recover the operation costs, and Sanergy fill this gap from their philanthropic donors who, like Sanergy, value the positive externality of safely treating and disposing of waste. Even if Sanergy addresses the treatment

segment as a private good that produces a marketable good (the reuse products), it is still a public good that would require large subsidies until it becomes financially sustainable.

Turning to the FS C&T services, here too Sanergy bears all costs. In general FS collection and transport services have little or no market value because of their public good nature. This is why in other contexts, especially in sewered sanitation, the government heavily subsidise sewer networks. To manage the service, Sanergy include it under their non-profit entity, along with the FLTs facilities, so it contributes to their own mandate to extend affordable and safely managed sanitation for LISs. Service providers offering competing services to Sanergy in Nairobi settlements only use FS collection and transport services when the pit is full and becoming unfunctional – this keeps costs low and is possible because there are no regulations or law enforcement to encourage regular emptying. This lack of regulation also means that even when toilet operators pay for the service (by non-Sanergy providers), it is usually a minimal fee to remove the sludge and dump it nearby without safe disposal. In Nairobi's LISs, the users of toilet, including the FLTs, are not involved in FS collection and transport provision. Users themselves are not expected to pay, nor do they have an incentive to do so; transporting the waste to treatment is a purely public good from their perspective, offering little personal benefit. For these reasons Sanergy bundles the FS C&T with the contract for the toilet with FL operators, because Sanergy values FS C&T as part of their social mandate.

In Nairobi LISs, the landlord typically monopolises toilet provision in his/her housing block. Tenants are constrained to use whatever facility their landlord provides and cannot introduce any other alternative facility. For that reason, users are not involved in the choice of provider, or the selection of FLTs. They only pay a small marginal cost bundled in their rent (or negligible cost if they were already living in the compound when the FLT was installed). Tenants only access the service and do not take part in any decisions relating to the facility's technology, its level of hygiene, or any maintenance arrangements. So, from the perspective of the users FLTs, which are in their nature, a club good, do not appear so to users, and are simply a monopolistic or choice-restricted provided service.

By contrast, from the perspective of the landlord, the FLT's club good nature disappears; from their point of view the toilet is a private good. They can choose one of a range of toilet types offered in a free market. Buying or subscribing for a toilet generates additional income (through raising the rent, or at least retaining tenants, and collecting entry fees in some case) so has monetary value for the landlord. The FLTs are marketed to the landlords, who are often required to provide a toilet in the vicinity of their housing blocks as per their tenancy

agreement with the tenants. There are no quality or service level standards for the landlord to abide by, so a landlord would only choose the FLTs if they are cheaper or more convenient *to the landlord* than the other options in the market. The other options in the market (e.g., shared pit latrines) are mostly cheaper since they offer the facility but do not include safely managed FS collection and transport. Consequently, Sanergy offers the FLTs at a subsidised rate to compete for landlords' demand. The landlord is only interested in covering part of the actual cost of the facility, and Sanergy subsidises the rest of the service from their philanthropic funders. Table 5 summarises the key stakeholders' perspectives on the three elements of Sanergy's services, which I discussed in the previous paragraphs, based on their role from market failure theory point of view and how it would theoretically incentivise them to contribute to its provision (either through funding, advocacy, subsidises, or policies and legislations.

Table 5: Stakeholders' perspectives toward their contribution to Sanergy's services (Author's own, 2023)

Service	***Fresh-life toilets***	***Faecal Sludge Collection & transport***	***Faecal Sludge Treatment & reuse***
User	**(+/-) Club good** (-) Positive externalities (-) Regulated monopoly [1]	(-) Public good (-) Positive externalities (-) Regulated monopoly [2]	(-) Public good (-) Positive externalities (-) Natural monopoly
Landlord	**(+) Private good** (-) Positive externalities **(+) No monopoly**	**(+) Private good** (-) positive externalities (-) Regulated monopoly	(-) Public good (-) Information asymmetry (-) Natural monopoly
Sanergy	**(+) Private good** **(+) Positive externalities** (-) No monopoly	**(+) Private & public good** **(+) Positive externalities** **(+) Regulated monopoly**	**(+) Private & public good** **(+) Positive externalities** **(+) Natural monopoly**
Nairobi City County	(-) Club good **(+) Positive externalities** (-) No monopoly	**(+) Public good** **(+) Positive externalities** **(+) Regulated Monopoly**	**(+) Public good** **(+) Natural monopoly** **(+) Positive externalities**

[1] *Users are only allowed to use the facility that their landlord decides to provide*

[2] *Sanergy monopolises the faecal sludge collection and transport*

***(+) Positive incentive to pay/fund**, (-) Negative incentive to pay/fund*

As mentioned earlier, there is a low recovery of costs, which is a natural result of the mismatch of interests in the provided service between the provider and the customer.

Sanergy, as an intended social enterprise, is committed to a service level (which has high operational and transaction costs). At the same time, the served community do not value or prioritise it in their expenditure plans toward basic services, considering their competing priorities such as water, food, and housing. There are no regulations to help Sanergy raise fees without losing customers.

Sanergy claims that scaling the service would recover costs and proposes to receive result-based financing (RBF) from the NCC to scale their service (Auerbach *et al.*, 2020). However, according to Mallory *et al.*, scaling CBS would actually incur more costs because of its high operational transactions (2022). Therefore, if Sanergy want to be financially sustainable it is crucial they address the financial sustainability of the service. While it is understandable to subsidise sanitation considering its public good nature (due to the positive public health and social impacts) the current funding model which depends on philanthropic funding to cover the financing gap is vulnerable and may not be sustainable. If the government is committed to ensuring higher service level, equitable sanitation without providing it themselves, then subsidies are clearly needed for organisations, such as Sanergy, that provide safely managed services along the entire SVC.

Role of the State

Kenya shows some commitment to providing sanitation, but it is neither sufficient nor sustainable. The state subsidises the sewer network heavily; the user paying a small share of the sanitation service costs bundled with the water bill. The sanitation component of the water bill conceptual covers the cost of the sewer network connection and the treatment segment, while the HH or the landlord provides the toilet. Some trunk sewers reach some of the LISs in Nairobi, but those settlements are not appropriately serviced due to the land legality issue (World Bank, 2019a).

States often invest more in sewer networks than onsite sanitation. Dodane *et al.* show that in Dakar, Senegal, the user pays only 6% of the total cost of sewerage, while in FSM, the user bears almost all the costs (2012). Such bias usually occurs because the provider of the sewer network is affiliated with or owned by the state (Daudey, 2018), and because people who have sewer connections tend to have greater lobbying power to keep prices low, compared to people who rely on FSM services. Besides, governments that depend heavily on loans from external funders, like Kenya, often choose the large infrastructure, that matches external funders' interests, as "*people-oriented service does not sell to donors*" (WASH Expert #4, 29.11.21). In addition, the service characteristics of sewer-based sanitation also aligns with

the perceived role of state to fix the market where the private sector cannot provide it; it is a public good that has monopoly tendency and benefits from the economy of scale. Importantly, sewer-based sanitation requires, once in operation, less transactions compared to onsite sanitation which appeals more to the state to reduce costs (Andrews, Pritchett and Woolcock, 2017)

The Government of Kenya heavily subsidises the segments of sewered sanitation that are a public good nature, which are also natural monopolies (sewer network and the treatment segment). Looking at Sanergy's CBS business, as shown in Table 1 the treatment is a natural monopoly and pure public good. Also, the FS collection and transport is a public good and, due to Sanergy's contract with the FL operator (landlord), is a regulated monopoly across the FLTs. In theory, the government *should* be interested in providing subsidy to cover those segments, especially since the sewer network cost is prohibitively more expensive than FSM (Dodane *et al.*, 2012; Daudey, 2018). However, during the interviews with representatives from the MoWS and Sanergy, it became clear that while the government provides institutional backup for Sanergy (e.g., licencing), there has been little financial backing on the implementation level to date (e.g., subsidy, loans), especially for the FLT segment.

The NCC's lack of interest in adopting CBS technology is a crucial barrier to providing a subsidy for Sanergy or other providers of safely managed sanitation along the entire SVC. According to employees from NCWSC and the MoWS, CBS technology does not match the long-term plan to extend sewers for all residents of Nairobi (NCWSC, 13.08.21; MoWS #1, 16.08.21). As mentioned earlier, the NCC did not consider CBS an improved sanitation option. Sanergy had to gain the trust and show evidence of the technology's viability until it was recognised as an improved sanitation technology in 2016 by the National Government in Kenya. Other WASH expert interviewees suggested that governments, including NCC, are less invested in services that do not involve large infrastructure and/or expenses are mainly towards human labour (WASH Expert #4, 29.11.21). Despite resisting CBS as an improved technology, the MoWS and the NCC perceive Sanergy to be doing a "*tremendous job*" since it is extending sanitation services where the county is failing to serve (NCWSC, 13.08.21; MoWS #1, 16.08.21). Regrettably, this does not appear to be enough to leverage funds from the NCC.

van Welie describes this scene in Nairobi as a splintered regime; it has multiple sanitation services in operation that meet different needs and preferences of their served population, but those services fail to align with each other (2018). These services are embedded in existing

institutional arrangements but these arrangements are fractured and multiple, and it would be impossible to replace them suddenly and create a monolithic regime of sustainable homogenous sewered services (Ibid). Instead, a sustainable and realistic transition that would first align the current services in the sector to address the challenges of providing the service to LISs and Nairobi, as a whole city, would be the first building block for a future city that serve all its population in a monolithic sanitation sector. At the current state, the CBS technology does not fit with sewer-based sanitation (for example, public flush toilets are better fit to sewer-based sanitation since both are water-borne technologies). Therefore, if Sanergy is interested to scale the service, it is vital to illustrate how it functions as an integral part and as a natural transitional service that pave the road to a monolithic regime of sewer-based sanitation.

The Position of Sanergy

Sanergy define themselves as a 'social enterprise'. A social enterprise is a revenue-generating business that aims to achieve social, cultural, community economic and/or environmental outcomes while generating revenue (The BC Centre for Social Enterprise, 2022). Sanergy claim to provide a dignified toilet service for the underserved that has health gains, tackles gender issues and girls' rights to access sanitation facilities at schools; Auerbach (one of the founders of Sanergy) claims that installing FLTs in schools has raised attendance and enrolment especially for girls (2016). Sanergy also claim to contribute to environmental protection as it minimises the open dumping of faecal waste in water bodies by handling it safely. Also, it is claimed the reuse products from the FS treatment contribute to food security and circular economy as they provide fertilisers for farming (Sanergy Staff #4, 25.06.21).

Sanergy also argues that it creates jobs as part of its social and economic impact. Some FL operators generate income, when they run FLTs in public places for a fee; some operators run multiple units to increase their income (Auerbach, 2016). In addition, sanitation jobs have been created in the sludge collection, transport, treatment and reuse segments of the service (Sanergy Staff #1, 22.06.21). Sanergy recruit pit emptiers from the served community to empty and clean FLTs under a contract. Sanergy believes that formalising the work of their emptiers provides protection from cartels and persecution (Ibid). However, according to Mallory *et al.* emptiers who used the designated transfer station in Mukuru receive threats from cartels as they see the transfer station taking over their business (2020). Sanergy also provide PPE, vaccines, health check-ups on a quarterly basis, a work uniform, and training.

As employees of Sanergy, pit emptiers have the rights to pension, health insurance, and leave (Sanergy Staff #4, 25.06.21). Sanergy argues that they have high retention of employees who appreciate working with Sanergy (Sanergy Staff #4, 25.06.21). In contrast, a pit emptier suggests the opposite as the pay rate for a pit emptying group in Sanergy is lower than working independently as a manual emptier (Independent pit emptier #2, 20.10.2021). Nevertheless, Sanergy emptiers appreciate the stable salary and other benefits (Ibid).

Although Sanergy provides support to pit emptiers on the operational level of the job, Sanergy do not work on the advocacy level to improve the livelihoods of workers in the long-term, such as addressing the legality of the job (WASH Expert #2, 11.06.21). The Septage Emptiers Association's representative interviewed believes it is crucial to localise work with pit emptiers such as Vuka Sasa in Kisumu, instead of foreign enterprises dominating the sector. They argue that Sanergy and similar entities, unlike local enterprises, do not prioritise a satisfactory level of income for workers and a sustainable improvement in emptiers' experience (12.10.21).

Nevertheless, Sanergy believes it is a socially centred service that tackles relevant challenges to its served population. It follows the private sector's pattern in providing sanitation solutions that combine environment protection and the human right to sanitation with making a profit (Fejerskov, 2017). However, it could fit a different definition than a social enterprise (e.g., a social programme). Despites its entrepreneurial aspect, it does not stand as a functioning business; it is highly subsidised from philanthropic grants (World Bank, 2019a). Sanergy claim they will generate revenue when the FLTs entity is able to scale and if they receive RBF from the NCC to continue providing the service. While it is understandable that sanitation services should receive subsidies since it is a basic human right, still the future challenges of scaling mean Sanergy, or similar models are not a viable business.

Figure 14 provides a representation of the current contribution of the philanthropic donors, where the circle's size is indicative of each stakeholder's share, channelled through Sanergy in comparison to the other stakeholders' current contributions toward Sanergy CBS service in Nairobi. Sanergy covers all upfront capital and operational expenditure and then collect fees from the landlords, that only cover marginal part of the total expenditure (of the containment segment of the service) and the NCC contributes by covering some of the capital expenditure (land) for the treatment plant. Figure 14 illustrates clearly the gap between the actual incentives of stakeholders' to contribute to the service and the theoretical understanding and expected stakeholders' incentives from economic perspective. As I showed in Table 5 and

according to the market failure theory, the government would theoretically be incentivised to cover most of FS transport and treatment elements of the service due to their public good nature, but as illustrated in Figure 14, it only contributes to a small margin of the FS treatment only.

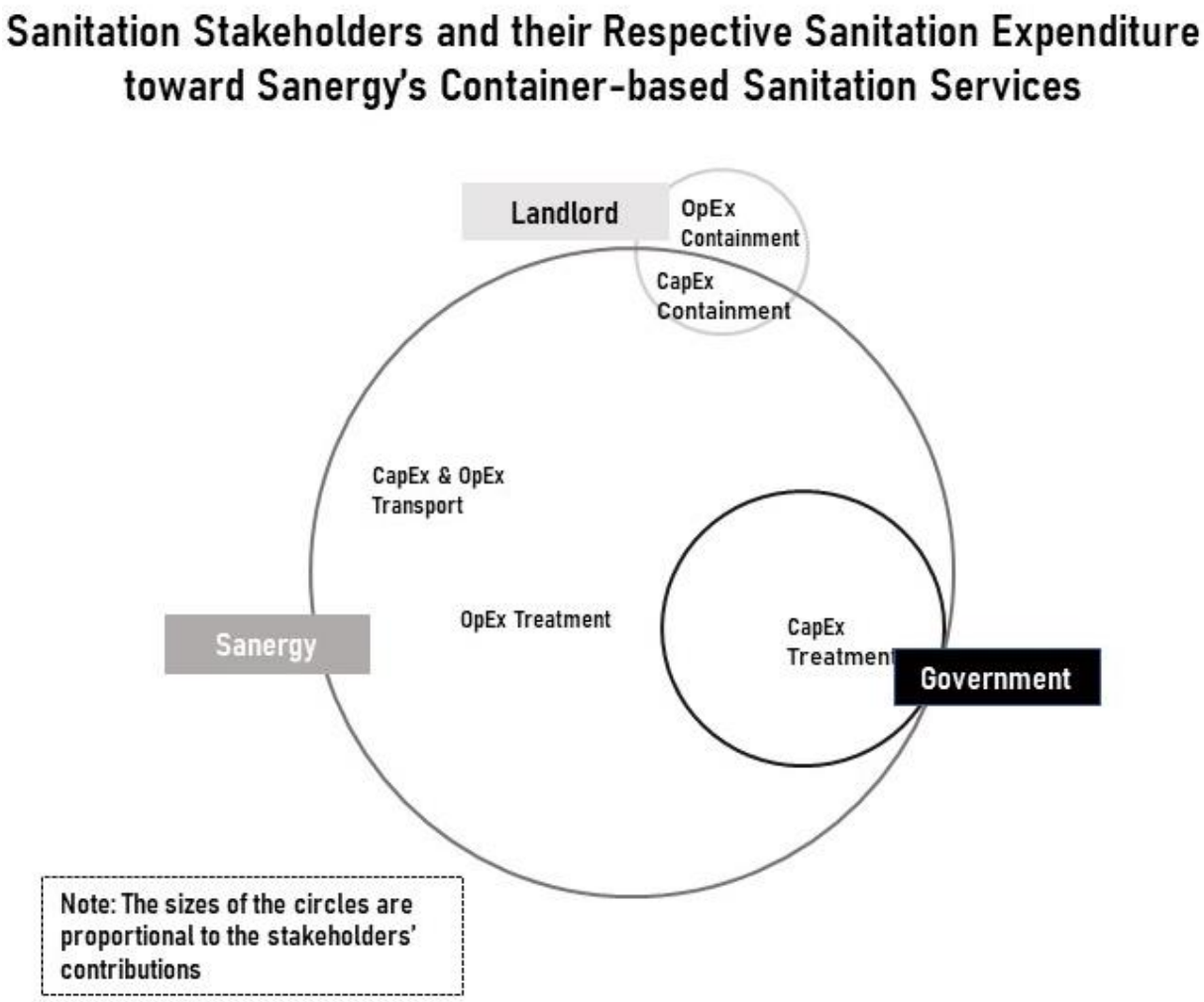

Figure 14: Stakeholders' expenditure Toward Sanergy sanitation services in Nairobi (Author's own, 2023)

The Issue of Market-based Sanitation

Reluctance to fund Sanergy is fuelled by the ownership dilemma of the service. A key informant argues that for Sanergy to become governmentally funded, it must hand over to the government, but Sanergy is unwilling to do this (NCWSC, 13.08.21). The ownership issue coincides with the case of Sanivation, a social enterprise partnering with Nakuru City County in Kenya. Sanivation runs a faecal sludge treatment plant and plans to eventually transfer it to Nakuru City once the plant operations break even through fuel production. In the meantime, Sanivation work to build the utility's capacity to operate the treatment plant (WASH Expert #5 18.01.). One can argue that the ownership transfer agreement, as well as the political

leadership of Nakuru City, have facilitated the Sanivation work. For instance, the treatment plant licensing is waived, the utility coordinates the FS collection and transport, and the utility is willing to learn and cooperate with Sanivation on the operational level of the plant. Several WASH experts also stated the ownership issues as even if subsidised by the NCC, the infrastructure would still be owned by Sanergy. The NCC is asset-oriented and would require ownership of the infrastructure in order to fund it (WASH Expert #1, 07.06.21; WASH Expert #4 29.11.21).

The MoWS is keen to promote Public-Private Partnerships (PPP) but Sanergy initially wanted to operate on a full private basis while partnering with the government. Throughout the interviews with Sanergy and the government organisations, it became clear that there are conflicting views on how the partnership should proceed. As stated earlier, publications from Sanergy stated clearly that they aim for RBF, which differs from PPP (Auerbach *et al.*, 2020). The RBF provides rewards to individuals and institutions after achieving agreed-upon results. In comparison, the PPP (as defined by MoWS) involves a long-term partnership between a private entity and a government agency where the private entity bears most of the investment costs in order for the government to provide a service. In the last interview with Sanergy public relations staff, they stated that PPP is now one of the options they are considering, but this statement may be in conflict with their plan of providing the service by themselves (interviewee details).

A fundamental issue of working with the NCC is the limited budget allocated toward sanitation. The priorities of state institutions depend on the individuals in power, which results in volatile conditions since the political scene of Kenya changes every six months (WASH Expert #1, 07.06.21; WASH Expert #3, 11.06.21; Sanergy Staff #6, 15.10.21). The recent progress made in sanitation at the policy and communication levels was due to the willingness of the previous chief administrative secretary at the MoWS (Mallory *et al.*, 2022). Similarly, the county of Nakuru was the first to implement a sanitation plan after devolution, as the governor and his successor were both ‘sanitation champions’ who would support sanitation initiatives (Mallory *et al.*, 2022). The NCC is now more aware of the interests of development banks in funding sanitation and has created the new Directorate of Sanitation in MoWS, so it can directly receive its own budget without delegating WatSan to the private sector (WASH Expert #3, 11.06.21).

5.6 Discussion

Sanergy's scalability is a questionable pursuit according to most of the interviewees not employed by Sanergy, as they believe the enterprise is not transparent about the service cost and FLTs uptake. "*They are interested in showing the low coverage of sanitation in their service area only when it is to justify their projects, but these numbers also provide a proof that they are struggling to expand"* (WASH Expert #3, 11.06.21). Another interviewee highlights, "*... when I looked at the prices, I said there is something that these people are not telling us - they are not sustainable; if you look at the price for a toilet and how much they are selling the manure for… I think they are heavily funded*" *(NCWSC, 13.08.21*). Some interviewees argued that Sanergy has the advantage of attracting funds and is functional because it is a foreign idea with foreign management and that this might not be the case if Kenyans started it. Mallory et al. report similar views, as their local interviewees see that "*they [International NGOs and enterprises] would come and go in the same way NGO projects come and go in informal settlements and disappear without a trace*" (2022, p.7).

The government and its partners perceive Sanergy as a short-term venture due to the onsite technology used. Despite acknowledging the current challenges of expanding sewers in LISs, the national government interviewees still think that in the long run services will be provided via a sewered system. As one interviewee puts it "*if we have enough good services [sewerage network], then we can enforce sewerage through policies, but for now, since we have these problems, we are co-existing with Sanergy, and other service providers and I don't know for how long*" (13.08.21). Sanergy acknowledges that their work is not in line with the government aim to extend sewage, and some of the interviewees said Sanergy perceive their CBS service to be a transitional point to ensure that LISs have access to sanitation until the government is able to expand sewered networks for all.

Taking the slow progress in extending the sewer network in Nairobi and Kenya in general, it seems inevitable that, if they want to provide safely managed sanitation, NCC and other counties will have to subsidise onsite sanitation services for many years. Daudey's systematic review of sanitation costs concludes that the sewer system is the most expensive, followed by septic tanks, ventilated improved pit latrines, urine diversion dry toilets (which includes Sanergy CBS) and wet or dry pit latrines (2018). Also, in Dakar, Senegal, the sewer system's annualised capital and operational costs are five times higher than the onsite system (Dodane *et al.*, 2012). Stating the cost advantage of onsite systems is not to dictate what technology to adopt but to advocate for accelerating access to equitable sanitation.

As a result of policy decisions onsite sanitation users bear most of the service cost, while sewer network users, who are usually better off, only pay marginal fees (WASH Expert #1, 07.06.2). One option that has not been explored in Nairobi is the use of cross subsidies which can be justified by the positive externalities of providing sanitation to all of the society and/or a public good that should be secured by the state. Clearly there is a need to waive some of the onsite sanitation costs for users who are not yet able to pay for connections. Cross-subsidies are an important option that the government could leverage. According to a study by Acey *et al.*, 75 % of respondents from two cities in Kenya, who already have sanitation covered in their areas, are willing to pay a sanitation surcharge to help provide sanitation for unserved communities (2019).

While it is understandable that a landlord should pay for a toilet, as explained earlier, they only have incentives to pay for an affordable option without the FS emptying, collection and treatment. Therefore, it should be a priority to subsidise the emptying and collection segment across onsite sanitation services. In the case of Sanergy, the subsidy would recover part of the FS collection cost and encourage more FS collection. In theory, Sanergy would increase their FS treatment operation, production of reuse goods, and eventually recover more expenditure from the sale of reuse products. Although the profit from the sale of reuse products can contribute to financing other parts of the service chain, this contribution is currently insignificant and would need to benefit from the economy of scale in order to increase the financial viability of Sanergy business model. Besides supporting the FS collection and transport, the treatment segment should also receive the state's subsidy. Although Sanergy attempts to make a private good, it is still a public good and the financial returns of the sale of reused products are not definite. Farmers' acceptability and uptake of reuse products are still low in many contexts, including Kenya, for its yield and the disgust of using fertilisers made from human waste (MoWS #2, 15.08.21).

In addition, the NCC's regulatory role should be activated to set minimum standards and collect taxes for FS handling to sanitation service providers and generators of waste. Such regulations would raise demand for the FS collection and transport and promote competition in providing the service. Not necessarily to impose more financial vulnerabilities on low-income HHs, but for the better-off institutions and businesses who can pay for it but currently do not, like local businesses that Sanergy collect organic waste from free of charge.

5.7 Conclusion

As explained in Chapter two, different schools of thought encourage private provision of sanitation services, such as Sanergy's service in Kenya, and there are successful examples of private provision of public services. However, in low-income settings, such as Sanergy's served area, private provision, while technologically viable, is unlikely to be *financially sustainable* without the state's support and intervention. The public good nature of sanitation undermines the marketability of Sanergy services, especially when it is not competitive with other providers. State intervention not only on the policy level but also on the regulatory and funding level is likely to be needed to ensure affordable, safely-managed services, and could be delivered without undermining the provider's financial capabilities. Private providers such as Sanergy also need to acknowledge the government's low incentives to provide funding. Clearly there is a need to find a middle ground to secure fully funded services that deliver both the private and public elements of sanitation, through subsidy and regulation, for example. This is liable to require a more sophisticated relationship beyond 'private' versus 'public' provider and may move them into shared ownership of some of the business assets under a PPP agreement. Re-valuating the informality and land tenure issue in LISs and centring equity are key to re-evaluate the financial commitments, technology preferences, and strategic development plans of the state. This should be studied in the light of the state's current commitments to high service levels (using publicly provided offsite sanitation) for the residents of the formal areas of Nairobi, who bear marginal costs, in comparison to the residents of LISs who depend on market-based sanitation.

Chapter Six: State Provision of Sanitation in the low-income settlements of Cape Town, South Africa

6.1 Introduction

In the previous chapter, it was shown that the public good nature of sanitation hindered the scaling of Sanergy services in the low-income settlements (LISs) of Nairobi, Kenya, and that the local government there did not commit to providing sanitation services to LIS residents. This chapter presents a counter case in Cape Town, South Africa, where the local government demonstrates some commitment to providing sanitation to LIS residents. This chapter also addresses the second research question: ***How do stakeholders' incentives interact with the institutional and economic characteristics of sanitation services***. The contrasting case studies of Kenya and South Africa illustrate how stakeholders' incentives are influenced not only by the economic characteristics of the service, but also by institutional and economic factors in the country. In Cape Town, the local government outsources sanitation services in LISs to private service providers, providing an example of productive engagement between the public and private sectors.

The following sections provide background on the history and current state of sanitation service provision in Cape Town's LISs, methodological considerations of the study, and a diagnostic of the City of Cape Town's (CoCT) arrangements for delivering sanitation services, including an analysis of the economic characteristics of the service and how they impact stakeholders' incentives. The final section discusses the implications of mismatched incentives among key stakeholders in the sanitation sector.

6.2 Literature Review

In Cape Town, sanitation for LISs is highly politicised, with historical ties to race-based conflicts with the Dutch and British colonials in the 17th and 19th centuries (Wilkinson, 2000). Full-flush toilets and other improved sanitation options were exclusive to the white population, while the non-white population used buckets (Dugard, 2016). After attaining independence in 1910, the apartheid government led by the National Party continued to enforce race-based segregation. It imposed legislations and policies to push the native population away from urban places occupied by the white settlers and to sustain their segregation into 'coloured and black townships'(Wilkinson, 2000; Feinberg and Horn, 2009). The non-white groups were forced into inadequate housing with limited access to basic services, including WatSan (Enqvist and Ziervogel, 2019). After independence, South Africa witnessed mass resistance, activism, and formation of labour unions and voluntary associations, including the African National Congress (ANC), who later led the resistance

movements against the apartheid government in the 1980s and won the first democratic elections in 1994 (Deegan, 2001).

The persisting segregation policies have created a long-lasting race-based marginalisation even after the end of apartheid. For sanitation, the post-apartheid government tried to minimise inequalities by increasing access to flush toilets and other improved sanitation options. Nevertheless, the challenge to extend sanitation in LISs was magnified, especially since cities in South Africa witnessed rapid urbanisation and the unforeseen influx of population. In 1994, the democratic government declared the constitutional right to basic sanitation for all citizens regardless of their housing status (Taing, 2017).

South Africa operates in a devolved governance system of national, provincial and local governments (Republic of South Africa, 1994). Devolved governance was a move to promote effective integration of the previously marginalised townships during apartheid and to enable the local governments to deliver basic services to those townships (Gukelberger 2018). The National Department of Water and Sanitation sets the standards and policies for delivering WatSan services. According to the Constitution, the provincial government oversees and intervenes in the work of the local governments (municipalities) if they fail to deliver their mandated services (Section 139, Republic of South Africa, 1996). As per the Constitution, local governments are required to provide basic sanitation services starting from containment to wastewater (WW) treatment and reuse for all citizens, regardless of their housing status (Republic of South Africa, 1996)

Despite the governance changes to improve the living conditions for the non-white populations in marginalised townships, the apartheid era still dictates reality. Many municipalities do not provide dignified services to the residents of LISs. Instead, they use the ambiguity of the right, which did not specify the service standards, to provide unhygienic public toilets, which the public did not accept as a dignified option (Robins, 2019). In 2015, Chumani Maxwele, a student at the University of Cape Town, emptied a portable flush toilet (PFT) on the campus' statue of Cecil John Rhodes, a Prime Minister of the Cape Colony during the British Colonisation, which fuelled protests and confrontations among the public (Botha, 2018).

In 2013, as Robins calls "*Cape Town's Year of the Great Stink*", social activists dumped human waste on highways and airport roads in Cape Town to protest the inequality and the failure of the CoCT to extend dignified sanitation to the black population living in LISs

(Robins, 2019, p.7). That year resonates with the Great Stink in the 19th century-London, where the hot summer of 1858 made the smell of the Thames river 'excruciating' due to the constant dumping of raw WW in it (Black, 2008). Despite the cholera outbreaks amongst poorer populations because of poor sanitary conditions, the issue only captured the interest of the politicians when the smell made sitting in the parliament unbearable (a public good/health concern) as it lay on the river's banks (Black, 2008).

Activism in Cape Town takes many forms, including the campaigns led by the Social Justice Coalition (SJC), such as story-telling, digital mapping, and budget analysis to pressure the CoCT to extend improved and dignified sanitation to the coloured and black population of the city (Jackson and Robins, 2018). Although the CoCT often implements sanitation programmes and pilots various sanitation technologies for LISs, the quality and sustainability of the services are limited. Also, many scholars and activists question its durability as a permanent service (SJC, 2014; Botha, 2018).

A key barrier to sustainable and equitable services is the conflicting views and incentives of the concerned stakeholders toward providing and using publically provided services. This Chapter utilises the case of state provision of sanitation for LISs in Cape Town to assess how the economic characteristics of services influence the incentives of public institutions (CoCT) and users to provide and use publicly provided services. The study captures the dynamics between the CoCT, LISs and local NGOs to understand the bottleneck in stakeholders' incentives and how to address it.

6.3 Materials and Methods

This study uses an analysis of the institutional and economic characteristics of the services funded by the CoCT to better understand the stakeholders' incentives in the case of public services. The CoCT is in charge of sanitation services for all the LISs in Cape Town Therefore, I address the issues of LISs in Cape Town as a single case study without limiting focus on a specific LIS. The following sections complement the Research Design Chapter by providing a detailed account of the research methods in this case study.

Data Collection

The research data in this chapter is drawn from literature and empirical data. Peer-reviewed publications were collected through a systematic search in September 2022 using the Scopus Search Engine to retrieve peer-reviewed research articles about sanitation services in Cape Town (*Sanitation AND "Cape Town").* The search returned 77 titles; 45 were included. I

excluded papers that did not focus on the governance, socio-economic and political settings of Cape Town in relation to sanitation. The search also captured grey literature, such as the SJC audit report and governmental publications through Google Search Engine and referral from experts. For the empirical data, I conducted in-person semi-structured interviews in Cape Town, with the support of a local research assistant, with community activists and CBOs (five interviews), and the CoCT private contractor (one interview). I also conducted online semi-structured interviews with local and international political economy (PE) experts (two interviews) and the CoCT private contractor (one interview). Before commencing the in-person interviews, the research assistant was briefed about the research aim and objectives, ethical considerations of interviewing and data protection considerations as she coordinated the in-person interviews in Cape Town and transcribed the interviews afterwards. The interviews discussed the roles of sanitation stakeholders in providing sanitation to LISs in Cape Town and the opposing narratives of the involved stakeholders toward addressing sanitation and housing issues in Cape Town. For each interview group, the angle of the discussion differed to match their expertise and role in the society.

Since there was limited published information about the various service models of the toilet technologies operating in the LISs of Cape Town, the interview guide for the service providers was designed to understand the service models of each provider and its financial viability. It also explored the management and decision-making process for each provider (starting from signing the contract with the CoCT, selecting the location of the toilet or recruiting workers for the janitorial services); this helped me assess the providers' incentive to sustain and expand their operations (resonates with monopoly tendency issues, externalities, autonomy of the involved stakeholders). The interviews also explored the providers' relationship and power dynamics with the CoCT and the served communities and the level of contribution and involvement of the CoCT in their operations (to prompt discussion about the nature of good for the different sanitation services, the autonomy of the service provider, perceptions about the externalities of providing the service).

The interviews with social activists and NGOs focused mainly on the value of sanitation (the nature of good) and how it drives sanitation demand (collective experience and, therefore, collective action). The interviews also tried to assess how the role of activist groups and NGOs differs in addressing the different services across the SVC to assess the key externalities and values that promote collective action to demand quality sanitation services in the LISs of Cape Town. I also explored the process of collective action to reflect on the

capacity of served communities to drive change (autonomy) and to understand their incentives to contribute to the publicly provided sanitation services and whether they opt for other arrangements (the nature of good).. The interview guides for each interview group are presented in ***Appendix 6.2*.**

The empirical data also included transcripts (two interviews) from the 'Amplifying local voices to reduce failure in the WASH sector' project's publicly available database that covers sanitation challenges in Cape Town (Barrington, 2022). **Appendix 6.1** provides a list of the included interviews and their date and source. I also included field notes from a visit to Khayelitsha BM section, ,a township that hosts several LISs in Cape Town, on the 15th of September 2022 as part of my participation in the Scaling up Sanitation (SOS) Project Consortium workshops on the 13-16th September 2022 in Cape Town. The workshop included interactive sessions with sanitation and political economy academics from South Africa and Kenya, which provided nuance to two cases in this thesis.

In addition, I included in this chapter notes from a meeting with a CoCT employee who provided a brief presentation about the mandate of the CoCT in LISs and have a Q&A session with the SOS project team the critical challenges of their work in LISs. Due to the changing plans of the fieldwork, I could not conduct formal interviews with the CoCT, as I received their internal ethical clearance after writing this chapter. Besides, their strict policy of reviewing any written work, including unpublished chapters, could have delayed my thesis submission. Also, after hearing a CoCT employee speak as part of the SOS Project Consortium, I realised that any further interviews would lead to the same findings, as the employee's presentation was almost identical to a published interview for another director from the CoCT, which I cite in this Chapter. Therefore, in consultation with my supervisory committee, I decided not to go on with interviewing the CoCT.

Data Analysis

Similar to the case study of Sanergy enterprise in Nairobi (Chapter five), this study explores the economic and institutional characteristics of sanitation in order to understand the incentives of stakeholders to fund or operate sanitation services. It uses both literature and empirical interviews to triangulate data. The study first thematically analysed the research data as shown in Figure 15, to draw the relationship between the opportunities and barriers to providing sanitation in the LISs of Cape town. I present the thematic mapping in this section as the findings and the discussion are presently differently. The code book of the thematic map is presented in Appendix 3.3 (c) as part of the Research Design Chapter.

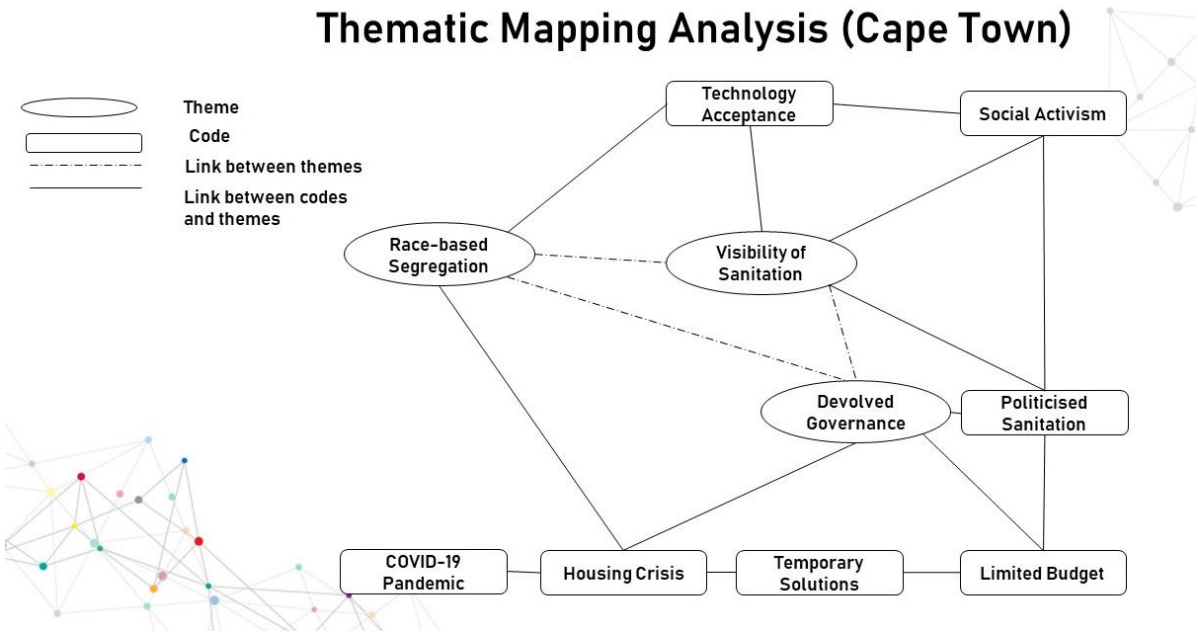

Figure 15: Thematic mapping analysis for the case of Cape Town (Author's own, 2023)

The thematic mapping was followed by an analysis of the economic characteristics of sanitation similar to the case study in Chapter five, in addition to other characteristics (presented earlier in Chapter two) that are relevant to the context of activism and collective action in Cape Town. Table 6 presents the economic and institutional characteristics adopted in this analysis as follows:

Table 6: Definition of key institutional and economic characteristics of basic services

Characteristic	***Definition***
The nature of good	Is defined by its excludability and rivalry. Excludability is the ability to deny non-payers access to a service (Ostrom and Ostrom, 1980; Cornes and Sandler, 1986) and rivalry is when consuming a good/service by an individual subtracts it from others (Cornes and Sandler, 1986)
Monopoly tendency	of a good occurs when the technical and financial requirements of providing it pose entry barriers to small providers and support single provider markets (Nauges and van den Berg, 2007).
Positive and negative externalities	are the benefits or costs to a third party that are not reflected in the market price of a service (Hyman, 2011).

Visibility+ measurability = attributability	is the ability of the user to assess the quantity and quality of the services and attribute its success/failure to the relevant stakeholders (Harris, Seim and Sigman, 2019).
Territoriality	The proximity and geographical boundaries of the service area; well-defined territoriality increase the visibility, and measurability of a service. (Batley and Mcloughlin, 2015). Therefore, it increases their capacity to identify collective needs and explore how to satisfy it, for example through collective action and community-led service provision

The analysis addresses the current sanitation services funded and/or operated by the CoCT in LISs. It interrogates the technological choices and service provision arrangements of the CoCT, but also explores the incentives of other key stakeholders, including the private contractors (Cemex and SaniTech), activists and households (HHs) in LISs in light of the economic and institutional characteristics of each type of sanitation services. The analysis identified the potential funding gaps and conflicting priorities between stakeholders throughout the SVC.

6.4 Sanitation in Cape Town's Low-income Settlements

Cape Town, the legislative capital of South Africa, has more than 500 LISs, making it a place of the biggest and fastest-growing LISs in Africa. The residents of LISs are supposed to receive sanitation services – toilets – from the CoCT free of charge. A key challenge for improving sanitation is the increasing migration and growth of LISs, causing a housing crisis. People migrate from Eastern Cape to Western Cape to find jobs and improve their living conditions. The Covid-19 pandemic has further increased the growth of LISs as people who lived in the backyards of other houses could not afford to pay the rent, especially with jobs loss, and they had to 'invade' lands instead (Ruiters, 2021; Seskhona, 22.09.22). Invading lands is to occupy vacant public or private land without a legal right or authorisation. According to an employee of the CoCT, 200 new settlements have emerged since the beginning of the pandemic (16.09.22). The CoCT currently has over 600 LISs that they need to provide formal housing for (Ibid). The CoCT aims to provide formal housing with basic services, including in-house tap and flush toilets, based on the Housing Development Plan introduced by the African National Congress (ANC) in 1994 (Kobel and Del Mistro, 2015).

Contested Roles and Responsibilities

Despite the increased responsibility on local governments such as the CoCT, there was a decrease in the national government's grants toward their operations between 1992 to 2001 (Miraftab, 2004). Also, those local governments did not have mechanisms to raise the finance to provide free basic services, especially for non-paying communities in LISs (WASH Researcher #2, 14.09.20). In 2004, the national government acknowledged the need to allocate funding for LISs upgrading and introduced grants such as the Municipal Infrastructure Grant and the Local Government Equitable Share (Mcfarlane and Silver, 2017).

National grants are often conditional to specific project types; the Municipal Infrastructure Grant is exclusive to labour-intensive infrastructure projects (Kobel and Del Mistro, 2015). In addition, grant allocation among the three governance levels is potentially biased due to the dynamics between the opposing political parties in power within those offices (Allison, 2002). Although those political parties emerged to resist apartheid and defend the dignity of the black and coloured population, the current scene shows they use sanitation in "*political point scoring*," especially in Cape Town (Robins, 2014, p.496). The ANC is in charge of the national government and all the provinces except Western Cape Province which is governed by the Democratic Alliance (DA; in Western Cape, Cape Town is the largest city (Mcfarlane and Silver, 2017). For instance, the ANC used the open toilet scandal in Cape Town, which I will elaborate more about it in the following sections, to its advantage for the 2011 elections up until it was reported that the same thing happened in the Rammulotsi Township in the ANC-controlled province (Robins, 2014).

Within the CoCT, the national grants are left to the management's discretion, which does not guarantee enough shares for sanitation services in LISs (Kobel and Del Mistro, 2015). According to a local PE researcher, extending sanitation services in LISs is not a political priority for the City since the middle and high-income populations of Cape Town do not support it (29.09.22). The CoCT promises to provide one communal toilet per 20 persons; it assesses the settlement conditions when new HHs move and reviews the applicable toilets options before installing more toilets (Kaiser, 2019). The coverage and types of sanitation services vary among LISs due to their varying conditions, including space availability, access, the year of establishment, political and social dynamics, location, and development (Kretzmann, 2022; Kaiser, 2019).

Full-flush Sewered Toilets

A dominant view is that the residents in LISs prefer FFTs as they provide the same experience offered to people in formal settlements, and are more pleasant to use (Botha, 2018). Full-flush toilets are provided as part of communal ablution blocks. These blocks also include showers, handwashing basins, and laundry facilities. The WW collected from communal ablution blocks is conveyed via the City's sewer network to the Borcherd's Quarry. There is often sewerage spillage, especially during winter, when the sewer trunks are flooded with stormwater. Borcherd's Quarry is the only wastewater treatment plant (WWTP) in the City and is part of the broader WW management unit at the CoCT. The Department of Water and Sanitation at the CoCT established the Informal Settlements Unit (WSISU) in 2007 to focus on improving services in the LISs. WSISU rents a space in the Borcherd's Quarry in order for the private janitorial contractors in charge of CBS to handle the waste containers onsite (emptying its content into the WWTP (CoCT, 16.09.22).

Although FFT is the desired technology of the residents of LISs, the CoCT often offer other *temporary* sanitation technology as the land conditions are often not suitable for extending sewer networks, required for flush toilets, or if the land is privately owned (Ibid). A social activist suggests that the City is unable to provide more permanent FFTs because it does not have a plan or budget to address the housing issue and its associated sanitation provision challenges; consequently, they cannot address the supposed constraints (22.09.22). Subsidising "*unnecessarily expensive options*" distorts subsidy programmes and undermines their financial viability and the capacity to increase sanitation coverage, especially when there are limited resources (Evans, van der Voorden and Peal, 2009).

Chemical Toilets

The CoCT substitutes FFTs with chemical toilets[6], which is one of the quickest sanitation services for them to rollout. However, it is expensive since it is provided under a rent contract where the private provider (currently SaniTech) bears any losses in assets (RockBlue, 2021). A social activist mentioned that, once, a CoCT official said that the cost of one chemical toilet could provide four FFTs; nevertheless, they chose it to overcome the "*constraints of providing permanent options*" (22.09.22). The contractor of the chemical toilet service communicates with the serviced communities to agree on the locations of the chemical toilets and the service time. SaniTech workers provide a full-service once a week, where they rinse the faecal waste compartments and wash them with a 25 litre of water and a litre of

[6] Chemical toilets are self-contained facilities that does not require toilets, it collects the human excreta in an enclosed compartment that has chemicals to control odour.

chemicals. The collection trucks pump out the faecal waste and when the truck is full offload it at the Borcherd's Quarry, record it and send proof to the City. SaniTech also uses GPS devices, which sometimes get stolen, to track their service progress and report it to the City (SaniTech, 28.09.22). Kaiser suggests that chemical toilets are the best served since the infrastructure is owned by private providers who have incentives to maintain it and avoid loss of assets (2019).

Container-based Sanitation

The CoCT resorts to CBS options to overcome difficulties in extending sewer networks for FFTs and limited road access for chemical toilets trucks (Palmer, 2013; RockBlue, 2021). The City provides and services toilets with buckets and portable flush toilets (PFTs), also known as Porta Potties, for single HH use. The WSISU provides the infrastructure and outsources the janitorial services to a private company (currently Cemex Trading Enterprise). According to a CoCT employee, a key feature of the PFTs is the security of using the facility (at home) for vulnerable groups, which is not provided by the communal toilets (16.09.22). In contrast, a SJC community activist argues that the PFTs are not desirable as the service undermines the privacy and dignity of the user; "*I cannot sit in a small bucket like this and expect someone to come sit on top of my waste… people rather squat in the bushes instead of using the portable toilets. How are you going to be able to relieve yourself in one room shack? When is your family around sitting there watching TV eating dinner? There is no privacy*" (SJC Activist, 22.09.22).

Cemex Trading Enterprise is supposed to service the CBS toilets three times a week, but any inappropriate use or inadequate maintenance causes the PFTs to break down since they are not designed for "*the task of full-time service in the first place*" (Palmer, 2013). Many users complained about the bad odour from the CBS when the previous contractor was in charge (Jackson and Robins, 2018). HHs replace the full containers of CBS toilets with fresh ones and carried the full containers out to a prescribed location to be collected and transported for emptying and cleaning at Borcherd's Quarry treatment plant (RockBlue, 2021). Cemex also has employees at the Borcherd's Quarry to empty the containers into a screening compartment to remove solid waste and prepare the WW to the following treatment stages.

In general, there are often disruptions in the janitorial services for all of the toilet options, which undermines the quality of the services. According to the social audit led by the SJC in Khayelitsha BM section, one in four of the audited FFTs was not working (SJC, 2014). Poor

servicing of the provided toilets undermines public health conditions, especially during the rainy season when LISs face extreme flooding (Kretzmann, 2022). According to the City's Mayoral Committee for Health, there was a significant surge in February 2022 (146 % increase from the same time in 2021) of diarrhoea cases among children and infants due to increased sewage spills in the streets of Khayelitsha (Ibid).

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As the quality of sanitation services provided to LISs has been low, social activists and the communities in LISs are on an ongoing mission to hold the City accountable. In 2009, the City installed FFTs in Makhaza, an LIS in Khayelitsha, without walls, which led to the 'open toilet scandal' (Robins, 2019). According to a WASH researcher, the City provided the option of distributing CBS for each HH or installing communal FFTs and asked the communities to take responsibility of building the superstructure around them. However, after installing the toilets, communities and social activists protested, which garnered media attention (WASH Researcher #1, 10.09.20). The City tried to contain the public's anger and installed walls of corrugated iron which the African National Congress Youth League (ANCYL) activists tore down; considering toilets with corrugated wall an insult to the dignity of the black community (Robins, 2014). The residents of LISs sued and won the case against the CoCT for providing such undignified facilities (Botha, 2018).

Conversely, the CoCT often puts the blame for a lack of safely managed sanitation on the residents of LISs, due to vandalism, and argues they are fulfilling their duty and performing better than other metropolitan governments (SJC, 2014). The City claims that 75% of sewage spills are caused by people throwing solid waste in the sewer, like dead animals and discarded car parts (Kretzmann, 2022). In a meeting with the CoCT employee in Cape Town he claimed that the failure of toilets is due to the low reporting of faulty toilets, but a social activist argues that community members make sure to report faulty facilities via the City's website as well as to their ward councillors, but the City is not responsive; "*If we can go to one of the ward councillors right now and ask how many reference numbers [complaints] they have for these toilets, you can count many. The City is unresponsive"* (SJC Activist, 22.09.22). There are also janitors who are supposed to report to the contracted company if they are encountering any problems along the SVC (Ibid). The sentiment of the social activist aligns with the finding of the 2017/18 Customer Perception and Satisfaction Survey conducted by the Water and Sanitation Department of the CoCT (2019). In some instances, residents self-organise and/or contribute to a service (e.g., water and flooding recovery), however,

communities are not willing to provide for themselves in the case of sanitation, as they consider it the responsibility of the CoCT (SJC Activist, 22.09.22). Protests such as closing the N2 Road and burning chemical toilets still take place, and some activists even scold their fellow residents if they accept the use of options such as CBS since they believe it will undermine their case when pressuring the CoCT for better sanitation (Ibid).

The various forms of activism to advocate for dignified sanitation stem from the years of assault and oppression of the colonial powers, and the following apartheid system, on the human rights and dignity of the black and coloured population in South Africa. To date, the City has attempted to improve their service provision to avoid conflict and violence with the public. In 2012 the City started the Expanded Public Works Program (EPWP), funded by the national government to improve the janitorial services for the communal FFTs (Taing, 2017). However, this remains an ongoing process that requires social activism to pressure the City to improve its service, including better working conditions for its janitors.

A key way for the CoCT to avoid confrontation with the public is recruiting ward councillors, who would be popular in their areas, to help the City and private contractors manage "*the community so that they are not out of control*" (Ndifuna Ukwazi, 20.09.22). Some ward councillors are willing to work with the community, but some members of the population believe that most councillors only care about their paycheck (SJC member/community activist, 22.09.22). As councillors work within a political party, *"their first interest is to pull the political lines right … some are not even addressing their communities' issues in the council. Yeah, they're just there for the fun of it"* (Ndifuna Ukwazi, 20.09.22). The CoCT also outsource sanitation service to private contractors, as explained earlier. The private contractor directly receives and addresses public complaints without any engagement with the City, beyond the ward councillors (Miraftab, 2004). According to a WASH researcher, private providers are often reluctant to take on such work due to the court cases raised in regard to sanitation services, which threatens their capacity as a private provider (WASH Researcher #2, 14.09.22).

6.5 Sanitation Service Characteristics in Informal Settlements

The advocacy work of SJC and other CBOs has transformed a toilet's value from a private to a public good through the CoCT to provide and improve toilet services (SOS meeting, 14.09.22) .The publicness made the collective power to demand the service greater (Batley and McLoughlin, 2015). Transforming toilets into a public good echoes Tyler Cowen's arguments that goods 'become' public as such definition is a social construct dependent on

the institutional context (Cowen, 1985). Toilets moved from being technically excludable and rival good, as I explained in Chapter two, where the user and the private sector have incentives to contribute toward its provision, into being non-excludable and non-rival; users are not willing to pay to access it, and they demand its provision on behalf of their communities, and not on a personal capacity. The advocacy work also ensures that the state will not exclude/discriminate against members of the communities based on their contribution toward the service.

Over the years, communities and social activists have employed the externalities (public health) and political visibility of toilets for mobilisation and advocacy work to improve toilet provision in LISs. In 2013, social activists and their communities employed their proximity to the non-poor to gain attention and expose the violations of the CoCT (open toilet scandal) against the dignity of the black population by dumping human waste collected in the PFTs on highways and airport roads in Cape Town (Robins, 2019). The higher-income population do not appear concerned with the wellbeing of the communities in LISs; in January 2021, more than 253 houses burned down in Taiwan, a LIS in Khayelitsha, and social activists faced rejection when they approached the business sector for financial support, even though the private sector benefits heavily from the cheap labour of residents in those settlements (SJC Activist, 22.09.22).

As the nature of toilets as a good is contested between publicness and privateness, the residents of LISs in Cape Town vary in their willingness to contribute to toilet provision. According to an NGO worker, some communities "*expect less or nothing soon from the state*" and fulfil their needs independently (Mcfarlane and Silver, 2017, p.13). Conversely, a Director at the CoCT argues that citizens have little incentives to contribute to toilet provision as they perceive it as a public good that the City is obliged to provide (RockBlue, 2021). The CoCT has attempted previously to make the cleaning of public toilets the responsibility of the served communities, but were met with rejection as the public did not perceive them as a dignified option; consequently they were not willing to maintain them (Taing, 2017). All the social activist interviewees argued that the residents of LISs take ownership of their basic needs, including sanitation. When a settlement flooded in Khayelitsha BM section, the communities were faced with rejection from the responsible government office and organised themselves with leadership from their ward councillor to collect money and rent a truck to pump (Ndifuna Ukwazi, 20.09.22). Some HHs build their own toilets and collect water for its use (Asivikelane Activist, 20.09.22). Ownership is also shown by the role of community

leaders who monitor the work of the service providers and reach out to the CoCT officials when the quality of the services is unsatisfactory (Ibid).

However, people's ownership toward the provided communal toilets is mostly low; SaniTech, the provider of the chemical toilets, loses 15 units a month as people cut and recycle the plastic structures for money (SaniTech, 28.09.22). In addition, the residents of LISs often believe that the malfunction of communal toilets is only due to the City's poor management (SJC Activist, 22.09.22). Limited ownership and incentives to maintain toilets can be attributed to the public nature of the communal toilet (non-excludable and non-rival) and the highly subsidised service, which lead to dependency of the recipient (Jenkins and Sugden, 2006). Some HHs often lock the toilet they are using to prevent other HHs from accessing it, this increases their ownership to the facility and motivation to clean and maintain it.

Although there is continuous mobilisation to provide dignified toilet infrastructure (FFTs instead of PFTs), this activism does not extend to the remaining parts of the sanitation value chain (safe conveyance and removal), which are lacking in LISs and are necessary to achieve public health gains (PE Researcher #02, 29.09.22). Besides, it is plausible that mobilisation is working due to the political visibility of toilets; communities' focus on toilet technology might have swayed the CoCT to only provide toilets, since this is highly visible, without ensuring appropriate O&M, safe conveyance, and removal of faecal waste. It is arguable that extending the various toilet services is not necessarily due to the City's commitment to improve the living conditions of the residents of LISs but mostly to avoid political unrest and for their political games with the opposing political party.

According to the two PE researchers interviewed, basic services provision in LISs is not a priority for the CoCT, especially due to other priorities for the middle and upper class (e.g., water security and flooding) (29.09.22; 02.11.21). They argue that the middle and upper classes are even against such provision since they believe that the black, poor communities would 'destroy' any infrastructure delivered to them (Ibid). Therefore, the CoCT has incentive to fund basic toilets only to a level that buys the population of LISs' and the social activists' silence. Any protests or hostilities are broadcast on media and the ANC party can, and have, used such stories against the DA, the opposing parting in charge of CoCT.

Cape Town as a city is deeply concerned with protecting and conserving recreational water. Any pollution incident would capture the public and the CoCT's attention, but the negative environmental externalities of unsafe faecal waste management, as a freshwater ecologists

put, "*free-flowing sewage, either flowing into the sea or flowing into the streets or into the canals*" does not receive such attention (Human, 2021). Free-flowing sewage into the streets is of course exclusive to neighbourhoods with poor housing and basic services, unlike the general status of Cape Town. The CoCT even uses environmental biodiversity conservation as an excuse to evict people from the lands they occupy; the Asivikelane activist expressed her frustration as in Camps Bay there is also a concern for the conservation of biodiversity, but they let people live there in *formal* housing (20.09.22).

As established, incentives to provide toilets are motivated by politics. Thus, the City's selection of service arrangements and technology does not promote the sustainability of the service. Some of the interviewees questioned the temporary solutions, such as PFTs and chemical toilets, which in the short-term meet the communities' needs but can be interpreted as them using the lack of service to pressure people to leave the LISs while also hindering any long-term settlement and housing arrangements (DAG 22.09.22; SJC Activist, 22.09.22). The CoCT currently contracts SaniTech, who bear the investment capital cost of chemical toilets (SaniTech, 28.09.22). SaniTech has incentive to provide the chemical toilets service due to its economy of scale in LISs. It monopolises chemical toilet provision in Cape Town, 90% of the municipalities in Western Cape as well as other municipalities in neighbouring countries, e.g., Botswana and Nigeria (Ibid).

Extending chemical toilets is not eligible for funding from the national government since it involves renting from private contractors (CoCT, 16.09.22). Despite this constraint, this option is heavily used by the CoCT under a rent contract, and there is no interest from the City to own chemical toilet assets (SaniTech, 28.09.22). If the CoCT owned the chemical toilets this would minimise costs in the long-term and make this technology, which is more acceptable than PFTs, eligible for national grants.

A key factor for the willingness of the communities to accept the CoCT proposed sanitation solution is introducing positive economic externalities for the served population through the EPWP programme. The CoCT currently recruits workers from the community they will serve for employment contracts of up to 12 months. It is also mandatory for the City's private contractors to recruit workers from the City's dataset. The EPWP, although only offering temporary jobs, has created more trust and willingness of the served communities to collaborate in maintaining the provided facilities. According to a resident of Khayelitsha, residents often perceived the government "*as the enemy*" that police people and demolish their homes, and the janitorial services helped to change their views (Overy, 2013, p.6). This

is also reflected in the residents' cooperation with the private contractors as "*they earn some money [so they feel] there is some giving back to the community*" (Cemex Trading Enterprise, 19.09.22).

Like the EPWP, contracting Cemex Trading Enterprise to provide the janitorial services comes under the initiative at the CoCT to economically support black entrepreneurs (Ibid). Cemex is a newly established company that won the current janitorial service contract. Cemex does not own any assets, most of the employees worked with the previous company, and currently rents all the facilities for its operation since they only have a short contract (three years) and cannot afford such capital investment, nor predict potential extension of the contract (Ibid). It is plausible that the CoCT will contract another company in the future to increase their impact when it comes to supporting more 'black entrepreneurs'.

The CoCT has contradicting stands toward owning the assets of their services. It retains the responsibility of any repairs of the containers of the CBS toilets serviced by Cemex "*this [the CBS] is their own baby*" which according to Cemex causes inefficiencies in the process (Ibid). In contrast, CoCT shows no interest in owning the chemical toilets and "*taking a lot of responsibility away from themselves*" as the private contractor would bear any assets loss in extending the chemical toilets, the fastest service to rollout and arguably preferred to CBS by the served communities (SaniTech, 28.09.22). There are regular audits conducted for the chemical toilet provider, as they have a large contract of 16 Million Rand monthly (Ibid), while there is no such thing for the CBS janitorial service (Cemex Trading Enterprise, 19.09.22).

Beyond the audit process for SaniTech, there is no monitoring and evaluation for the performance of the current two private contractors. The CoCT only involve ward councillors in the operations of the contractors. According to the SaniTech employee, the company would benefit from more engagement with the City, but CoCT does not have resources or capacities to monitor the operation of the private contractors (SaniTech, 28.09.22). However, this is problematic since previously some contractors did not commit to the terms of their contracts such as the frequency of cleaning and maintaining the facilities (Overy, 2013; SJC, 2014).

In the last segment of the SVC, the FS treatment requires high capital investment, which makes it a natural monopoly only the public sector can provide. The WSISU rent space at Borcherd's Quarry WWTP. It is a public good that the CoCT manage to cover without a need to introduce new infrastructure. There are no reuse products or monetary gains from the

current arrangements and therefore the low cost (compared to constructing a new plant) is the main driver for this. Table 7 summarises the various ways that stakeholders perceive sanitation and their role in providing it.

It is plausible that the CoCT is committed to the FS treatment since the technology (water-borne) toilet services provided are in line with the technology used across the city (water-borne sewered system) and therefore the treatment takes place at low cost. The current arrangements by the CoCT to provide sanitation in LISs can be described as a polycentric sectorial regime as the set of service regimes complement each other and are aligned in terms of infrastructure, organisational arrangements, time and space not only in the LISs but across the city (van Welie *et al.*, 2018). For example, Borcherd's Quarry WWTP has a designated space for handling the CBS containers onsite, which facilitates the work of the janitorial services contractor. However, there is still a misalignment and instability among these services as there is a lack of trust between the users and the providers, mainly since some of these services do not meet the expectations of the users (Ibid). Therefore, the current regime is slowly becoming fragmented as positive social interaction between the users and the providers is lacking (Ibid). More efforts are needed to increase the alignment between the current services in the sector.

Table 7: Stakeholders' perspectives toward their contribution to CoCT's services in LISs (Author's own, 2023)

Service	***Household &Communal Toilet***	***Janitorial Service***	***Trunk Sewers***	***Wastewater Treatment***
Household[1]	**(+) Public good**	**(+) Public good**	(-) Public good	(-) Public good
	(-) Positive externalities	**(+) Positive externalities**[3]	(-) Positive externalities	(-) Positive externalities
	(-) No monopoly	(-) No monopoly	(-) Natural monopoly	(-) Natural monopoly
	(+) Visible and measurable	**(+) Visible and measurable**	(-) Not visible nor measurable	(-) Not visible nor measurable
Social Activists[1]	**(+) Public good**	**(+) Public good**	(-) Public good	(-) Public good
	(-) Positive externalities	**(+) Positive externalities**	(-) Positive externalities	(-) Positive externalities
	(+) No monopoly	(-) No monopoly	(-) Regulated Monopoly	(-) Natural monopoly
	(+) Visible and measurable	**(+) Visible and measurable**	(-) Not visible nor measurable	(-) Not visible nor measurable
Private Sector	**(+) Private good**	**(+) Private good**	(-) Public good	(-) Public good
	(-) Positive externalities	(-) Positive externalities	(-) Positive externalities	(-) Information asymmetry
	(+) Regulated monopoly[2]	**(+) Regulated monopoly**	(-) Natural monopoly	(-) Natural monopoly
	(-) Visible and measurable	(-) Visible and measurable	(-) Not visible nor measurable	(-) Not visible nor measurable
City of Cape Town	**(+) Public good**	**(+) Private good**	**(+) Public good**	**(+) Public good**
	(-) Positive externalities	**(+) Positive externalities**	(-) Positive externalities	(-) Positive externalities
	(+) Regulated monopoly	**(+) Regulated monopoly**	**(+) Natural monopoly**	**(+) Natural monopoly**
	(-) Visible and measurable	(-) Visible and measurable	(-) Not visible nor measurable	(-) Not visible nor measurable

[1]*The contribution is in the form of social activism to pressure the City of Cape Town to provide it*

[2]*The CoCT grant exclusive contracts for service providers to serve a certain area*

[3]*Temporary Employment,* ***(+) Positive incentive to pay/fund****, (-) Negative incentive to pay/fund*

6.6 Discussion

Despite introducing several toilet technologies and service provision modes to increase access to sanitation in LISs (Palmer, 2013), the CoCT is still unable to provide sustainable sanitation solutions. This is arguably because toilets have played a part in the human rights and social configuration of Cape Town since colonisation (Mcfarlane and Silver, 2017). Toilet technology in Cape Town is judged by the level of dignity it promotes, with the FFT being the preferred option. CBS and chemical toilets, which are increasingly promoted by the CoCT, are seen to reinstate and validate the 'dispensable lives' concept that the Cape colonisers have established against the black and coloured population (Botha, 2018 p.19). It portrays a temporary solution for LISs and townships which are assumed to be temporary; Khayelitsha BM section was established in the 1980s and the CoCT is still unable to provide permanent housing or permanent service infrastructure like sewerage networks to individual plots. Currently, the CoCT provides three toilet technologies for communal and HH use. By ostentatiously promoting their provision of toilets, CoCT placate residents of LISs without addressing the root housing issues that are used as the City's official excuse for not providing permanent sanitation services (SJC Activist, 22.09.22). Advocacy groups such as the SJC advocate for a budgeted plan by the CoCT to upgrade LISs and realise better urban housing conditions for LISs which is necessary to introduce permanent water-borne sanitation for those communities (Ibid). Some residents in LISs are willing to relocate, however, it is vital to know and agree on the location prior to such movement (Seskhona, 22.09.22; Ndifuna Ukwazi, 20.09.22). People migrate to urban places to access jobs and education, and they build the social capital necessary for their survival (DAG, 20.09.22; Cemex Trading Enterprise, 19.09.22). Therefore, for relocation to be acceptable it would need take these needs into consideration (DAG, 20.09.22).

The CoCT can prioritise city-wide issues such as water scarcity and flood management and has mobilised the public to address these issues in the past. For example, low rainfall between 2015 and 2018 predicted Cape Town would enter extreme drought conditions (known as Day Zero) in 2018. The City initiated several interventions, and the total use of the city in the dry season dropped from 1200 Mℓ/d to 523 Mℓ/d by February 2018 (Taing *et al*., 2019). Using several campaigns, including a disaster preparedness plan in 2017, had tangible impacts and

ultimately avoided Cape Town's Day Zero, though those measures were only a short-term solution (Ibid).

Although it is different issues, it is arguable that the City is capable to address the persisting housing issues, which is the root cause of poor sanitation services for the communities in LISs. Nonetheless, improving the housing conditions and sanitation services is not a priority for the middle class nor the CoCT (PE Researcher #2, 29.09.22). The City even uses the water scarcity issue to justify non-sewer sanitation for LISs and expecting them to change "*the flush and forget mentality… citizens must be made aware of sanitation so that they give it more consideration and take it less for granted"* (RockBlue, 2021), which is not the case for the middle and high-class populations of the City who only minimised their water consumption when the city was facing the extreme water crisis in 2018 and returned back to their old practices afterwards (Taing *et al*., 2019). Robins argues that the open toilet scandal was shocking and received attention from the upper class only because it resonates with what they use (FFTs) and that is why open defection, which is the same with regards privacy, never captured the attention of the upper class or the media despite being a chronic issue (2019).

The City is very interested in outsourcing sanitation service delivery in LISs, unlike the arrangements for delivering sanitation in middle and upper-income neighbourhoods. In 2004, only 25% of the outsourced basic services were operating in the middle and upper-income areas and the rest were in LISs (Miraftab, 2004). This allows the City to fulfil its commitment in the short-term, avoiding confrontation with the concerned communities and scoring politics points against the ANC party, without providing long-term, equitable and dignified solutions to the communities in LISs. The outsourcing is problematic in Cape Town's case since the City uses it to *disassociate* itself from the communities and the service providers who provide the 'municipal service' on its behalf (Ibid). A WASH academic suggests that contractors are often a middleman to communicate with communities and promote the City's sanitation projects (WASH Researcher #2, 14.09.20).

Ostrom and Ostrom describe a governmental organisation that contracts a private entity to deliver sanitation as the 'collective-consumption unit', and the private contractor would be the 'production unit' (1980). The consumption unit pays for the production unit to deliver the service. A key role of the consumption unit is to receive complaints (from the end consumers) and monitor the production unit to achieve its goals and hold the production unit accountable. However, the CoCT consumer-producer relationship with Cemex and SaniTech is flawed, as

accountability is not achieved because there is no involvement from the City in monitoring the providers' work (Ibid). Figure 16 summarises level of investment of the key stakeholders toward the various sanitation services in the LISs of Cape Town.

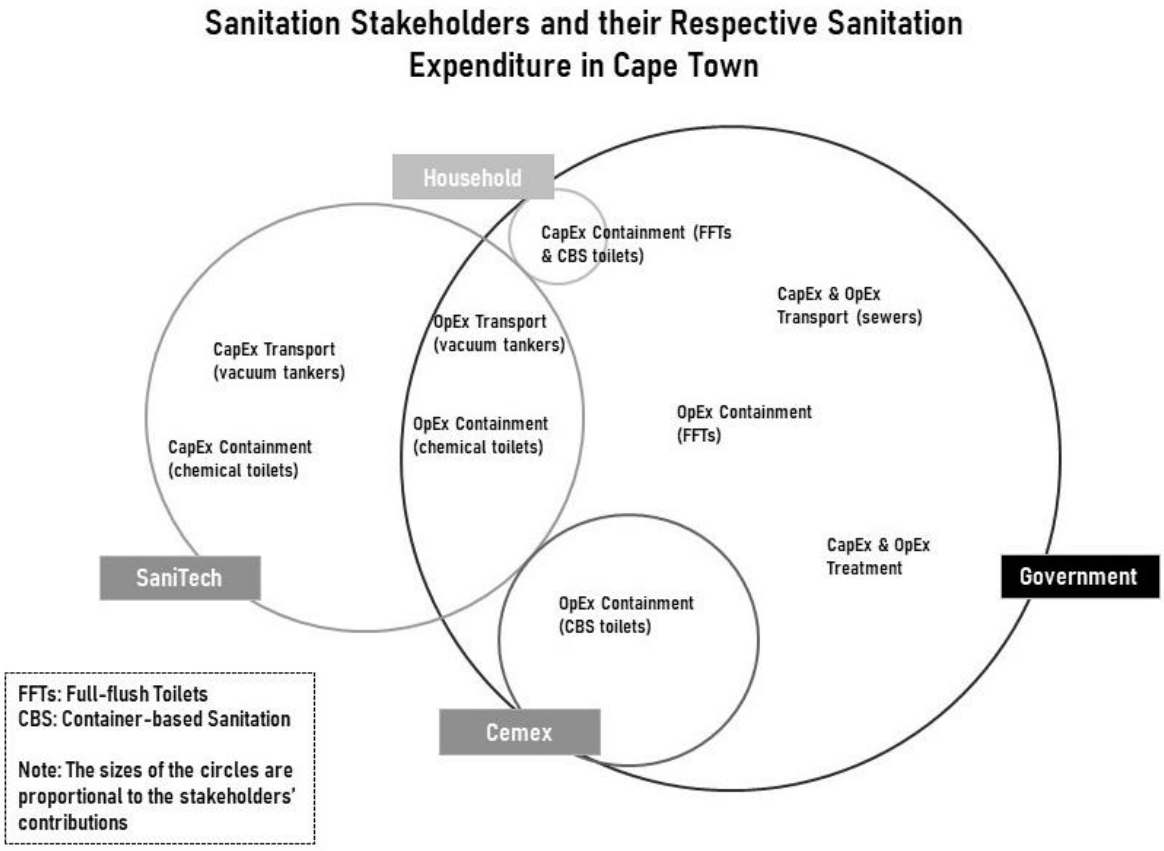

Figure 16: Stakeholders' expenditure toward sanitation in the LISs of Cape Town (Author's own, 2023)

The CoCT at first ran the janitorial services without consultations with the served communities and employed workers from outside. This resulted in resistance from communities and, in many instances, physical assaults of workers as the served communities felt entitled to this employment opportunities, instead of outsiders (WASH Researcher #1, 10.09.20). At that time, the Social Audit led by the SJC showed that the janitorial services are dysfunctional and communication between the CoCT and the communities was poor. Communities members said "*The toilets don't get cleaned and they are not safe, it gets better if we clean them ourselves"* and "*They don't communicate well with us as residents, we clean the toilets ourselves as we don't get the service*" (SJC, 2014, p.33). The CoCT has since, based on the recommendations of the Social Audit led by SJC, improved the employment allocation to increase people's acceptance. However, the management teams for the janitorial services still face intimidation from the temporary employees as they want to extend their contracts (Taing, 2017b). According to a community leader, janitors "*are not bothered by the*

work conditions" and they often do not have incentive to do well at the job since it is a temporary and they are unable to pressure the City to extend their contracts since it they are given to 'everyone' on a rolling basis (SOS field notes).

The CoCT has often coupled sanitation with job creation programmes, which burdens it with heavy administrative work and has "*detracted from the sanitation-related objectives*" as it undermines the stability and the quality of the service (Taing, 2017b, 308). Besides, coupling sanitation with other programmes reinstates sanitation as a short-term initiative that the City take on whilst guaranteeing the buy-in of the served communities as they are benefiting temporarily from the employment programmes, without a long-term development process. Such programmes also help the City tap into national government grants in order fulfil its role since they have the employment component, a preferable funding area for the national government (WASH Researcher #1, 14.09.20). Such an approach of attempting to achieve multiple goals is evident among public officials and politicians to attract public funding despite how "*harmful [this is] for internal efficiency*" of their organisations. (Krause, 2007, p.32).

Robins argues that it is solely the efforts of social movement and activists such as SJC and Abahlali to improve sanitation in some settlements (2019). The constant demand of the public from the City to provide dignified sanitation to date has been the driving force to make progress. However, advocacy for sanitation has been centred around the toilet technology only (PE Researcher #2, 29.09.22), which is understandable since it has a strong association with exclusion, dignity, and temporality (Botha, 2018). Contrarily, flooding and sewerage spills in LISs do not attract attention despite their huge impact on the public health of the populations of LISs. In addition, the power of self-organising and collective action is evident more in the historically established settlements such as the BM section in Khayelitsha, while newly-established settlements such as COVID-19 is still to receive support from local NGOs that mobilise collective action. This is expected since the previous experiences of activism helped the development of social capital over time, established leadership, homogeneity and age of settlement influences their capacity to self-organise (Ostrom *et al.*, 2002).

The SJC worked with the residents and the community leader organised them to re-build the settlement to improve the use of space (Kiefer and Ranganathan, 2020). Representatives of several political parties recognised the political visibility of such initiative and wanted to engage with it which the SJC refused since it is a community-led project without any political agenda (Ibid). The CoCT took on the reblocking process with the involvement of the SJC in

other LISs. However, land status was a barrier for benefiting from the initiative, just like extending FFTs. Settlements were only eligible if they were on publicly owned land and not part of any planned development for the next five years (Ibid). CoCT also restricted participation to communities who had a history of 'engaging and organising themselves' (Kiefer and Ranganathan, 2020) which disqualified new settlements who were yet to organise themselves and had with limited access to support and capacity building. It also put the responsibility on communities to deliver such change while navigating their other vulnerabilities like access to basic needs and employment.

The reblocking process, as described by Kiefer and Ranganathan, was "*messy negotiations and the awkward meshing of grassroots processes with formal institutions*" (Ibid, p.264). Upgrading is only considered when it does not interfere with the lucrative potentials of redevelopment and privatisation of the occupied lands (Bhan, 2014). The work of the SJC has proved important to deliver change for LISs and the socio-political context of the country guarantee them the right for such advocacy (Allison, 2002). However, Allison questions the extent to which such organisations would still be effective in realising basic rights on the long-term. The SJC is in the process of ending their alliance due to internal organisational challenges. Similarly, the other organisations interviewed in this study are dependent on external donors to continue delivering their work and support for LISs.

6.7 Conclusion

Sanitation provision in the LISs of Cape Town is an example of how national policies and a country's history drive the state's incentive to provide sanitation services to LISs, unlike the context of Kenya presented in Chapter five. However, the local government's incentives to provide basic sanitation does not necessarily extend to the SVC beyond toilets. This case study has shown how the political visibility of toilets and transferring them from a private to a public good are driving the incentives of all the stakeholders to either fund or advocate for it. It is not seen as an excludable and a rival good to each user, therefore stimulating demand and contributions from each user who have access to it and in turn stimulating free market provision. Instead, it is seen as a non-excludable and non-rival public good that the state should subsidise to all citizens. Publicness is addressed differently between societies, sometime it is used in advocacy spaces like the case of Cape Town, sometimes it becomes a priority concern that qualifies for support, as its externalities impact the society as a whole like the case of the sanitary state of the poor in the 19th century London.

The previous case study in Chapter five, as well as some of the views presented in Chapter two, show how the public good nature of a service disincentivises users from paying for it. This case is consistent with this statement, however, transforming toilets to a public good was a powerful tool from activist groups to make the CoCT commit to providing toilets. Nevertheless, accountability to ensure safely managed and dignified toilet services is only the interest of local human rights groups as the CoCT contracts service providers with little engagement beyond funding. The private sector participation in this case is only through the CoCT's outsourcing arrangement and not in the free market. The economy of scale and monopoly arrangements, especially for the chemical toilets, provide economic incentive for them without the need to bear the market risk such as lack of demand and low WTP.

Chapter Seven: Aid Dependency in Providing Sanitation in the Gaza Strip, Palestine

7.1 Introduction

As the three previous case studies presented, in Chapters four, five and six, did not include heavy involvement of external aid, this chapter utilises the context of the Gaza Strip, Palestine to reflect on the impact of external actors on the incentives to deliver sustainable sanitation in humanitarian context coupled with political complexity. This chapter also addresses the second research objective: "***to assess how stakeholders' incentives interact with economic characteristics of sanitation services"*** and interrogates the impact of external dependency on stakeholders' incentives.

The previous cases involved autonomous governments who are influenced in their decision making by a mix of exogenous and endogenous factors. In contrast, the two ruling governments in Palestine are completely dependent on external aid and therefore regardless of the impact (positive or negative) of the endogenous factors, which I explain next, the exogenous incentives outweigh the endogenous ones since the two ruling governments cannot make decisions nor they can self-fund sanitation services. This case also reflects on the incentives issue in the light of occupation (the Israeli apartheid) and lack of the state's sovereignty over its resources and borders.

The following section provides a brief review of the critical political changes in the last two decades as they contributed to current inefficiencies in basic service provision in the Gaza Strip. It then explains the methodological considerations of the study, followed by a description of the status of sanitation service in the Gaza Strip, and a breakdown of the roles and relationships in the sector. Similar to the previous two case studies, I then provide an analysis of the economic characteristics of sanitation across the Gaza Strip and how they interact with stakeholders' incentives for funding. I then discuss the implications of incentives mismatch and the priority issues to improve the sustainability of externally funding sanitation services.

7.2 Literature Review

The Gaza Strip is a densely populated area in Palestine, with 2.1 million living on 365 km^2 (PCBS, 2020). The residents of the area have been living in a protracted humanitarian crisis for the past two decades due to the prolonged Israeli occupation and recurrent armed operations against the Gazans. In 2020, more than two thirds of the population were considered in need of humanitarian assistance (Foqahaa *et al.*, 2020). Since the Islamic Resistance Movement (Hamas) won the Palestinian elections in early 2006, significant

financial sanctions and constraints have been imposed against it by the Government of Israel (GoI). The GoI froze the transfer of taxes (borders customs and VAT) to the Palestinian Government; GoI collects taxes on behalf of the Palestinian Government as stipulated in the Oslo Accord[7] (COHRE, 2008). The international community, including the European Union (EU), United States (US) and other Western countries, froze financial assistance to the Hamas government, which is now referred to as the 'de facto government'. The US also prohibited monetary transfers to the Gaza Strip and refused to work with the Hamas government as a punitive action to Hamas's armed resistance against the Israeli Occupation. Those sanctions were partially lifted in 2007; Fatah President Abbas formed an emergency government of the West Bank, currently referred to as the Palestinian Authority (PA), to channel aid to his government (COHRE, 2008; Barhoum, 2021). However, forming a separate government has isolated the Gaza Strip and fuelled internal division and inequalities in living standards, economic disparity, and access to basic services between the Gaza Strip and the West Bank (Farsakh, 2008; World Bank, 2018e). This disparity is evident in access to water and sanitation (WatSan) services. For example, since 2010 access to improved water in West Bank has continued to improve (93% in 2016), while in the last two decades, access to improved water dropped from near-universal coverage to almost zero in all the governorates of the Gaza Strip (World Bank, 2018e).

The Gaza Strip, widely described by the international community as an 'open-air prison', suffers restrictions on movement of humans and goods from the shared borders with the Israeli Occupation and Egypt (COHRE, 2008; Qarmout, 2017; Tannira, 2021). Beside the several economic and social challenges of these arbitrary border restrictions, basic services are under constant stress and susceptible to failure. WatSan infrastructure such as WWTPs across the Gaza Strip are mostly overloaded and not functional due to the Israeli restrictions on the entry of energy, basic construction material and spare parts (World Bank, 2018e). Ninety percent of the collected WW (excluding onsite sanitation) is only partially treated and then, along with the untreated WW, dumped directly into a nearby valley or the Mediterranean Sea (World Bank, 2018e). The recently finished WWTP in the town of Bureij

[7] Oslo Accord is the first peace agreement (Declaration of Principles on Interim Self-Government Arrangements) between the Palestinians and Israelis. It was signed by the Palestinian Liberation Organization (PLO) chairman (Yasser Arafat) and the Israeli Prime Minister (Yitzhak Rabin) on the 13th of September 1993 in the White House mediated by the president of the United States (Bill Clinton) and UN Security Council. In the accord, Israel recognised the PLO as the sole representative of the Palestinians, and the PLO recognised Israel's right to exist in peace. The agreement defines the security, electoral, public administration and economic arrangements during the interim period of five years until achieving a permanent settlement in accordance with the UN Security Council.

in 2021, funded by the German Financial Cooperation, clearly illustrates the inefficiencies and failure of the WatSan services in the Strip. It took 20 years of lengthy planning and consultation with the Israeli authorities, such as agreeing on the location of the treatment plant, whilst the actual construction took four years, impacted by constraints on the entry of basic construction materials (KFW, 2021).

Even when sanitation infrastructure is in operation in Gaza, it is susceptible to bombing by the Israeli army. Several water and sewer networks and treatment plants were completely or partially destroyed in the last five Israeli operations in 2008, 2012, 2014 and 2021. For instance, in the Protective Edge Operation in 2014, 20 km of water network pipes and 15 km of sewage networks and carrier lines were damaged; 11 water reservoirs were partially damaged, five water tanks were completely destroyed, and 12 sewage pumping stations were partially damaged (AIDA, 2015). Around US$34 million in losses in WatSan infrastructure was estimated by the Palestinian Water Authority (PWA) and the Coastal Municipalities Water Utility (CMWU) during the fifty days of the Protective Edge Operation (GVC and PHG, 2017).

After each escalation, millions of development aid dollars are donated to the Gaza Strip, although not through the Hamas de facto government (for reasons described earlier), to deliver humanitarian programmes. Various mechanisms have been established to channel aid to Gaza, without dealing with the de facto government, this has included direct transfers to the West Bank government, setting up the temporary Gaza Reconstruction Mechanism (GRM), and transfers through the Egyptian Government, who often acts as a middleman in fund raising and ceasefire negotiations in any event of escalation from the Israeli Occupation in the Gaza Strip.

Each of these mechanisms contributes to the inefficiencies and ineffectiveness of the development efforts in Gaza and deprive the Gazans from their legitimate right to participate in the reconstruction process. For instance, the GRM was established after the Israeli mass destruction in 2014 to facilitate the entry of essential material for reconstruction. The GRM is an agreement between the PA in the West Bank, the United Nations (UN) and the GoI to avoid delays and constraints that the GoI impose on imports. Despite being a temporary solution, the GRM is still in use. It even legitimised the GoI's ultimate control over the 'dual use' list of imports despite the extensive involvement and monitoring by international donors (Martin and Klawitter, 2017, p.3). Dual use is a phrase used to refer to construction material that can be used for military purposes. GoI does not want Gazans to have access to materials

that are needed for reconstruction but could be repurposed to be used for military purposes. In 2017 Oxfam published a report to document the impact of GRM on the WatSan sector; less than half of the approved WatSan projects were completed and around 3000 'dual use' items critical to these projects were not approved at the time, each item would need separate approval by the GoI even when the project itself is approved by the Israeli authorities (Martin and Klawitter, 2017).

Due to the lack of autonomous governance and economic sovereignty in the Gaza Strip, the role of aid donors is vital to the development of WatSan, not only in initial funding of the capital expenditure but also operations. Despite continuous aid, the funded WatSan services in the Gaza Strip lack sustainability and are far from achieving universal coverage to all its population. Several development scholars argue that the relief and development programmes within the Gaza Strip "*remained limited and lacked a long-term developmental component aimed at eventually leading to full recovery [from Israeli mass destruction]*" (Qarmout, 2017, p.93; Jebril and Deakin, 2022).

The sustainability of the service provision in the Gaza Strip is undermined by the selective fund allocation toward certain types of programmes, motivated by existing biases and incentives of donors to fund certain types of programmes (Jebril and Deakin, 2022). This study explores the issue of donors' selectivity in funding sanitation services in the Gaza Strip. It explores the incentives of stakeholders in allocating funds by looking at the economic and institutional characteristics of services across the SVC and their relevance to stakeholders' incentives.

7.3 Materials and methods

This study uses the service characteristics analysis to explore the incentive issue behind the ineffective external aid to sanitation services in the Gaza Strip. Since the stakeholders and the institutional and economic features in the five governorates of the Gaza Strip are almost identical, I use the Gaza Strip as a single case study. The following sections complement the Research Design Chapter by providing a detailed account of the research methods in this case study.

Data collection

This study adopts a qualitative approach that builds on secondary literature about that discuss WatSan services in the Gaza Strip. . Due you to limited peer-reviewed literature about the governance and socio-economic challenges of WatSan services in the Gaza Strip, I have also

reviewed literature from the health sector to inform this case study. Limited evidence from the literature also meant collecting more empirical data compared to the previous case studies.

Due to movement restrictions during the COVID-19 pandemic at the time, and the long-term movement restrictions in the Gaza Strip due to the Israeli Occupation and the Egyptian Government, I could not conduct in-person interviews. In-person interviews were necessary, especially to reach interviewees working in utilities and NGOs, as they expressed their interest in talking in person when I first approached them. Consequently, it was necessary to collaborate with a research assistant to facilitate and conduct the in-person key informant interviews in the Gaza Strip.

Prior to conducting the interviews, I briefed the research assistant on the data protection and ethical considerations of the study, and I had several discussions with her about the key topics; the interview guides (see **Appendix 7.1**) were also shared with her at an early stage to prepare for the interviews. The research assistant also collaborated with me on systematic mapping, which was a helpful exercise to prepare her to lead the interviews. The interview questions explored the funding issues in the sector, and the dynamics between external donors, water utilities and NGOs. The interviews also covered the technical and political challenges of delivering sustainable sanitation services in the Gaza Strip.

The research assistant conducted a series of in-person semi-structured interviews with WASH experts (three interviews), INGO workers (four interviews), water utilities (two interviews) and a worker at a local human rights organisation (one interview); **Appendix 7.2** provides a list of the key informants.

The interview guides were informed by my work experience in the Gaza Strip and my local knowledge and exposure to the pressing issues in the WatSan sector. It was also informed by the service characteristics framework. As shown in the interview guide, I provided facts and examples as props unlike the other case studies. I asked more direct questions to help the research assistant navigate the interviewing process taking her brief experience in qualitative interviewing.

For the expert interviews, I first asked about their views on the current technologies adopted in the Gaza Strip regarding operational capacity taking the area's several economic and political challenges. I then asked questions about the current coverage and forms of sanitation services and the plans to upgrade it across the Gaza Strip (and the stakeholders involved).

These questions help reflect on the nature of good and whether there is monopolistic service provision. I have also asked about their views on external aid donors and their relationship with national and local Palestinian policymakers and service providers to discuss key service characteristics such as nature of good, visibility and measurability, autonomy, externalities, and access to information.

For utilities, the interviews started by inquiring about their current sanitation services, functionality, operational arrangements, key stakeholders and funding agencies. The interview also included questions about their views on the current externally funded projects and their suitability for the context of the Gaza Strip. This inquiry helps to reflect on the perceptions about the roles and responsibilities to deliver sanitation (nature of good, monopolistic provision and externalities), the priority service characteristics to different stakeholders (visibility and measurability of the service), as well as the power dynamics among stakeholders including the WASH Cluster, information sharing, and their autonomy as a local service provider.

For NGOs, the interviews explored their current sanitation projects and their choices in terms of services, the geographical distribution of their projects across the Gaza Strip and their approach to engaging and coordinating with different stakeholders in the planning of sanitation services across the five governorates of the Gaza Strip. The questions also focused on the relations and role of external donors with NGOs and their local partners. These questions helped reflect on key service characteristics such as the autonomy of NGOs in selecting and running their sanitation projects and their views about the roles and responsibilities (nature of good, access to information, externalities).

The interviewing started in June 2022 and ended in August 2022. The research assistant conducted the interviews in Arabic (the local language) and transcribed them to English to ease the data analysis and reporting. Some stakeholders would have provided vital insights to the study, including the PWA, World Bank, and GVC. However, they were not responsive when I contacted them via email or WhatsApp. Also, some donors, like the World Bank, do not have offices in the Gaza Strip, making it difficult to approach them.

Data Analysis

Similar to the previous case studies, this study focusses on the service economic characteristics of sanitation (such as monopoly tendency, visibility, public/private good). Understanding the service characteristics provides insights about how infrastructure correlates

with the incentives of stakeholders. Firstly, I thematically mapped the research data as shown in Figure 17 to draw the relationship between the opportunities and barriers to providing sanitation in the Gaza Strip. I present the thematic mapping in this section as the findings and the discussion are presently differently. The code book of the thematic map is presented in **Appendix 3.3 (d)** as part of the Research Design Chapter.

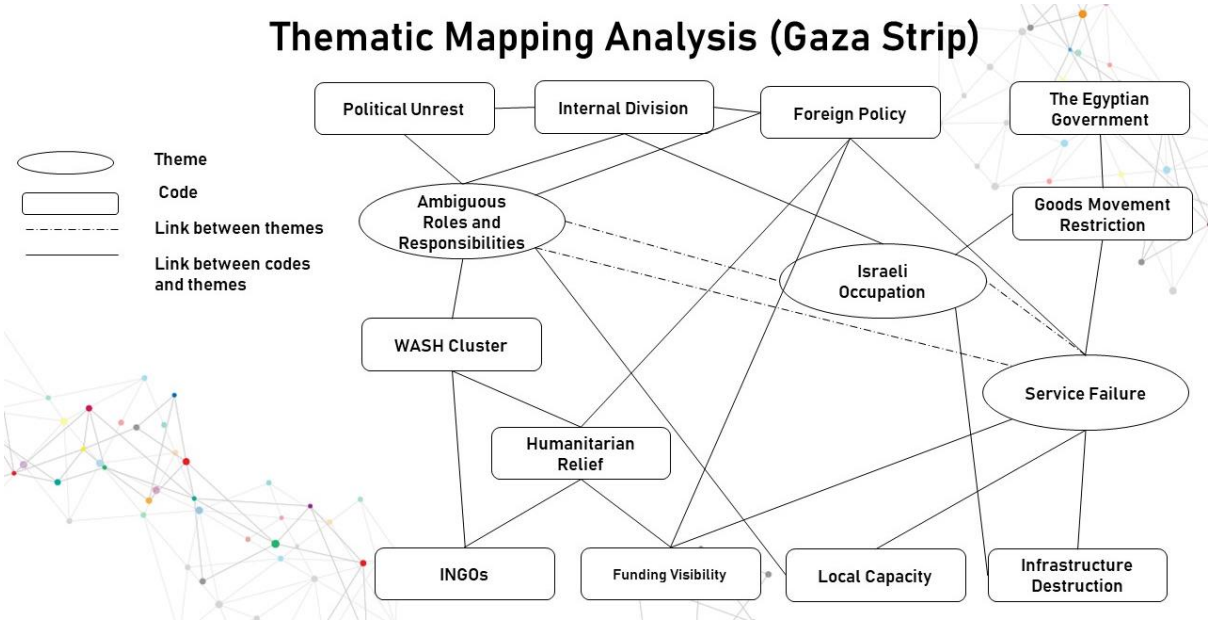

Figure 17: Thematic mapping analysis for the case of the Gaza Strip (Author's own, 2023)

Secondly, I analysed the economic and institutional characteristics of each service offered in the Gaza Strip across the SVC using concepts defined in Table 8 (Cornes and Sandler, 1986; Ostrom and Ostrom, 1980). Thirdly, I analysed the incentives of key stakeholders in light of the economic and institutional characteristics of sanitation.

Table 8: Definition of key institutional and economic characteristics of basic services

Characteristic	***Definition***
The nature of good	is defined by its excludability and rivalry. Excludability is the ability to deny non-payers access to a service (Cornes and Sandler, 1986; Ostrom and Ostrom, 1980) and rivalry is when consuming a good/service by an individual subtracts it from others (Cornes and Sandler, 1986).
Monopoly tendency	of a good occurs when the technical and financial requirements of providing it pose entry barriers to small providers and support single provider markets (Nauges and van den Berg, 2007).

Positive and negative externalities	are the benefits or costs to a third party that are not reflected in the market price of a service (Hyman, 2011).
Visibility+ measurability = attributability	is the ability of the user to assess the quantity and quality of the services and attribute its success/failure to the relevant stakeholders (Harris, Seim and Sigman, 2019).

As impact and political reasons behind the Israeli restrictions and sanctions toward the development of the Gaza Strip, including sanitation, are well-known; this analysis focused on the external donors' agenda. Donors are the most influential stakeholder in the WatSan provision. Consequently, it is crucial to unfold the underpinnings of slow progress in sanitation, despite the intensive funding that has recently begun to dry up. The stakeholders considered were users/households (HHs), external large donors, small-scale donors, public service providers including municipalities, and the CMWU and their role (delivery or funding) in promoting the development of sanitation in the Gaza Strip.

7.4 Sanitation Service Provision in the Gaza Strip

The Local Government Performance Assessment (LGPA) in 2016 suggests that 99% of citizens in the Gaza Strip have access to improved sanitation HH full-flush toilets (World Bank, 2018d). Nevertheless, this estimate is questionable as it does not reflect the quality of the service. For instance, the LGPA does not provide an assessment of the functionality of the sewerage network. In 2018, the sewerage coverage had reached 76%, only a small improvement in the last two decades (WHO, 2020). The repeated destruction during the Israeli escalations, intermittent energy supply, and lack of essential spare parts severely impact the capacity and functionality of the sewer network and all the other sanitation services in the Gaza Strip (Barhoum, 2021).

Households or their landlord arrange for the construction of full-flush HH toilets as part of the housing arrangement. Some INGOs provide HH toilets but this is a temporary relief response to citizens of partially or fully demolished houses after an event of Israeli escalation (GVC and PHG, 2017). As Figure 18 shows, the WW conveyance and treatment services are heterogeneous across the Gaza Strip depending on location and level of urbanisation. The refugee camps have the highest sewerage coverage as the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA) office is mandated and has the resources to provide basic services to Palestinian refugees in those camps (WASH Expert #1,

05.06.22). Khan Younis governorate, which encompasses several rural towns, has the lowest sewerage coverage of 37% compared to 93% in Gaza and North Gaza, 77% in the Middle Area, and 64 % in Rafah (World Bank, 2018d). Onsite sanitation users, mostly located in Khan Younis, either informally arrange emptying of their cesspits or submit a request to the concerned municipality to collect and transport WW to a pumping station or discharge it to nearby sewerage manholes (Gaza Municipality, 21.06.22).

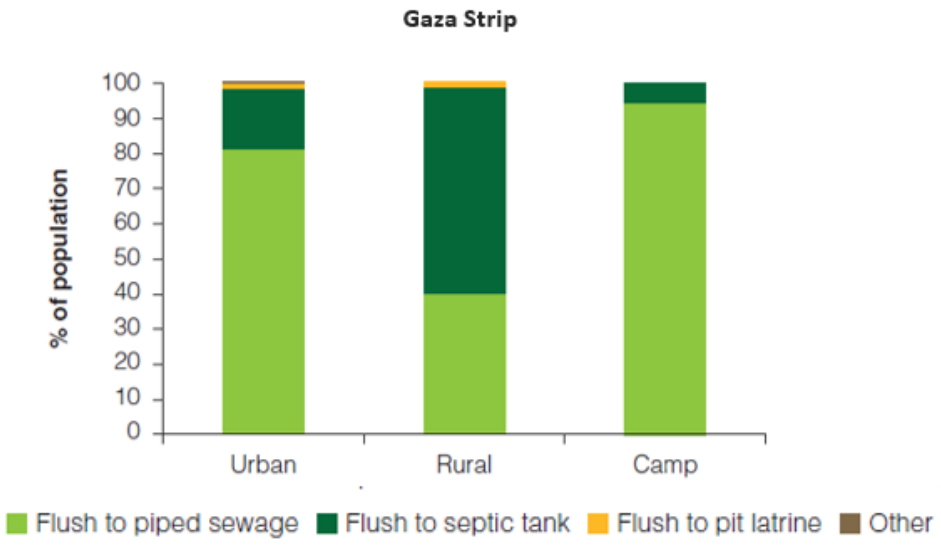

Figure 18: Type of sanitation distributed by region in the Gaza Strip (adopted from the World Bank based on the MICS, 2014)

The WW is conveyed by gravity via the sewer network to a pumping station to collect and screen the WW to be pumped to a WWTP. There are five WWTPs across the Gaza Strip, each with different operational capacities, mostly using biological treatment to minimise energy consumption (Efron, Fischbach and Giordano, 2019). As the WWTPs are often operating over their design capacities, have limited power to operate the facilities, and are often missing spare parts; the WW is only partially treated. As mentioned earlier, the partially treated or raw WW is disposed-off (approximately 108,000 m^3 daily) in the sea or the Gaza Valley, which undermines the quality of the coast, the only leisure destination for the Gazans. In July 2017, the death of a five-year old boy, as well as many unwell citizens, was attributed to swimming in the polluted coast (United Nations, 2017; Efron, Fischbach and Giordano, 2019).

Ambiguous Roles and Complex Relations

The Palestinian Water Authority (PWA) is the main policy maker and regulatory body in the WatSan sector, other institutions like the Ministry of Health, Ministry of Local Government

(MoLG), Environmental Quality Authority, Palestinian Standard Institute; Ministry of Finance and Planning; UNRWA (inside the refugee camps); Ministry of Education and Higher Education; Ministry of Agriculture; and the Water Regulatory Council have mandates on specific issues (El Swaity, 2019; WHO, 2020). For instance, the Environmental Quality Authority is concerned with quality of the discharged 'treated' WW (El Swaity, 2019). In reality, the PWA office in the West Bank, is in charge of high-level communication and relations with external donors since it is affiliated to the Fatah-led PA, unlike the other governmental institutions, which are affiliated with the Hamas de facto government the Gaza Strip who not part of the decision making process (WASH Expert #3, 03.07.22). There is also a discrepancy of how those government institutions perceive the WatSan sector, the PWA perceive it to be its sole mandate, in isolation from other institutions, while, the MoLG identifies WatSan as part of its jurisdiction along with housing and other public services issues (World Bank, 2018e). The National Water Strategy 2012- 2032 is the most recent national plan for the WatSan sector. It emphasizes the importance of cooperation between all governmental offices to enable a coordinated development of the sector (El Swaity, 2019). It also sets quantifiable objectives, and investment needed to improve the water and WW services (El Swaity, 2019). However, according to the GLAAS 2018/19 report sanitation services, both in the Gaza Strip and Palestine, did not receive any funding from the National budget, set by the Fateh-led PA, to improve the service (WHO, 2020).

In 2005, the CMWU, a Common Council of Services, politically independent and neutral service provider, was established to create efficiency by coordinating service provision for all municipalities in the Gaza Strip and established five regional offices across the Gaza Strip (CMWU, 05.07.22). It worked closely with the WatSan departments in the 25 municipalities. After the internal division between the PA and the de facto government in the Gaza Strip, Gaza City and Jabaliya municipalities withdrew and the two CMWU offices there were shut down (World Bank, 2015; CMWU, 05.07.22). The offices of CMWU still exist in the Middle Area and Khan Younis municipalities but do not play a significant role. In Rafah, the CMWU has full mandate over the delivery of WatSan services as per their agreement in 2009 (Ibid).

The WatSan sector receive funding directly from donor countries or multilateral donors who fund projects of a relatively developmental nature, like infrastructure. Until now, there is no clear mechanism for defining the priority investments with those donors in line with the local needs (World Bank, 2018e). International non-government organisations (INGOs) act as facilitator for some donors by implementing some projects of humanitarian and emergency

nature due to the fragile humanitarian status of the Gaza Strip. Those INGOs has been working since 2006 under the WASH Cluster umbrella, led by UNICEF, to promote coordinated, accountable and effective humanitarian work in the WASH sector (GWC, 2022). Several UN agencies, International NGOs, the PWA and service providers including the CMWU and municipalities, plan and coordinate the delivery of WASH humanitarian support (The WASH Cluster, 13.06.22). The WASH cluster is primarily concerned with the planning, coordinating as well as advocacy efforts. For instance, it produces annual humanitarian response plan to identify people in need and the most vulnerable people and their key needs which informs the humanitarian work of INGOs such as GVC, Oxfam and Islamic Relief (Ibid).

Due to the protracted humanitarian crisis, the WASH Cluster and its member organisations have a permanent role in the WatSan sector, and they contribute to needs beyond their mandate, such as energy and chemicals procurements due to the pressing operational needs of existing services (Ibid). Although this aligns with the humanitarian-development-peace nexus, their work only offers a quick fix of a persisting issue and does not necessarily tackle longer-term transformational needs (Fanning and Fullwood-Thomas, 2019). It is argued that it diverts them from their key focus on providing humanitarian support to the most vulnerable groups and work on emergency preparedness plans that are crucial for the resilience of the Gaza Strip population, especially those who were internally displaced during the Israeli escalations (The WASH Cluster, 13.06.22; CMWU, 05.07.22). In addition, there is the Strategic WASH Advisory Group (SAG), a consortium of key organisations such as the PWA, UNICEF, Oxfam, JVC, MAAN and Hydrogena. The consortium is in charge of endorsing the WASH strategic plans (INGO #2, 25.06.22).

The PWA facilitates multilateral funding to the CMWU to bypass municipalities (which are affiliated with the de facto government) and comply with the policy of external donors against the de facto government (CMWU, 05.07.22). Similarly, INGOs who provide WASH humanitarian support work directly with the CMWU to bypass the de facto government or provide support indirectly to municipalities through local NGOs (INGO #2, 25.06.22). One interviewee argues that the PWA has an authoritarian and top-down relationship with municipalities; municipalities participate in national planning of the sector; but only the PWA sets funding priorities (Gaza Municipality, 21.06.22). Besides, municipalities independent from the CMWU and the PWA have minimal budget compared to the CMWU; *"due to the division, the PWA prefers working with the CMWU rather than municipalities since the first*

is more acceptable for the donors" (Gaza Municipality, 21.06.22). The CMWU has become "*a focal point in the water sector for donors*" which arguably increased burden on the CMWU and lowered its institutional strength (World Bank, 2018b, p.16). CMWU support the municipalities to provide the service in return for agreed operational payment, but the municipalities are not able to meet their financial obligations due to low tariff collection, and the PWA are not able to enforce this (CMWU, 05.07.22). In general, the political division has impacted the governance of the WatSan sector, as one interviewee puts it "*we have two from everything; two opinions, two ministries, there is no agreement to one national plan, Ramallah [Fatah-led Palestinian Authority] don't have control on Gaza, and Gaza government [Hamas de facto government] does not care about any new institutional arrangements …*" (Ibid).

External donors have further exacerbated the ambiguity of roles, coordination, and tension between the involved institutions; instating the division through a 'no contact policy' with the de facto government and their exclusive coordination with the PWA (World Bank, 2018a). For instance, the work of the GVC, an INGO, lacked coordination with the Ministry of Interior Affairs due to that policy, which impacted heavily the flow of the GVC's work and capacity to deliver HH level humanitarian interventions (El Swaity, 2019). Besides, the lack of inclusion prompts the de facto government to dismiss the policies of the Fatah-led PA in the sector; most of the WatSan projects are VAT exempted by PA but the de facto government levy its own local taxes from contractors, which undermines the funding allocation (El Swaity, 2019; WASH Expert #1, 05.06.22).

The donors' relationship with the two Palestinian governments varies based on the NGO. For instance, Muslim and Arab donors like Turkey and Qatar work closely with the de facto government as they do not favour Fatah over Hamas (INGO #1, 22.06.22; El Swaity, 2019). Other organisations sign MOUs with the PWA office in the West Bank but without direct coordination with the Gaza office, and choose to work with local NGOs, who coordinate with the de facto government to facilitate work on the ground (INGO #2, 25.06.22). The United States Agency for International Development (USAID) has cut its funding completely since 2017 as part of the Anti-Terrorism Clarification Act, passed by Congress and then signed into law by President Donald Trump in 2018 (Knell, 2019).

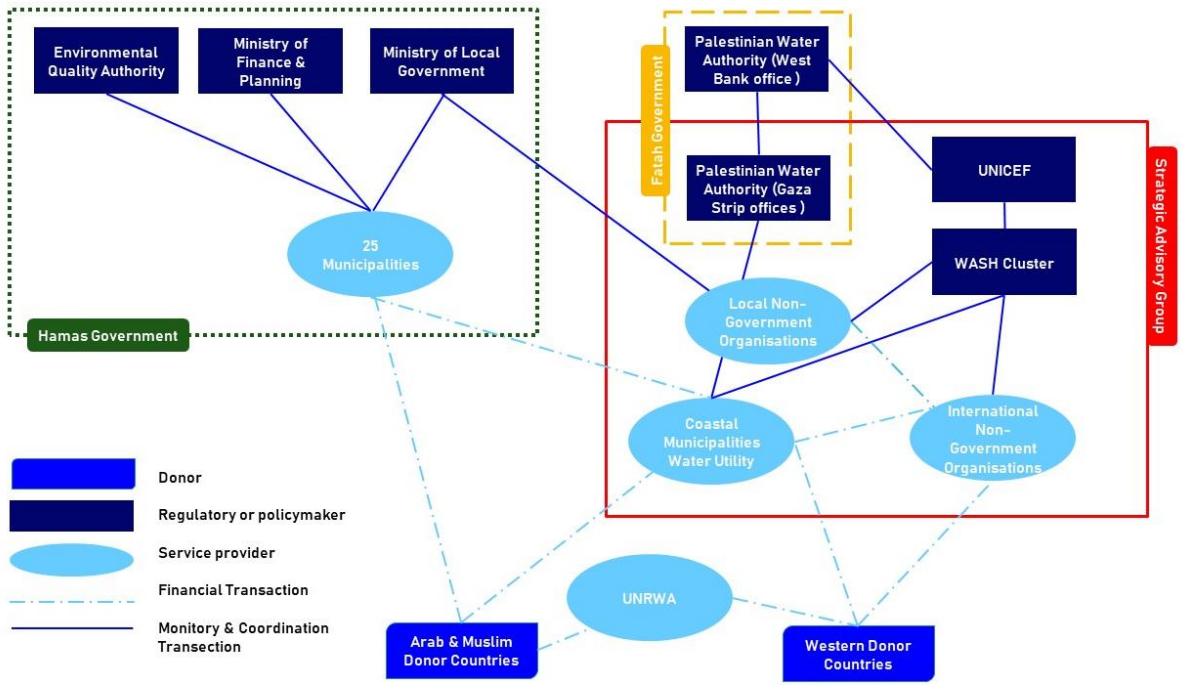

Figure 19: The key organisations involved in the delivery of sanitation services in the Gaza Strip (Author's own, 2023)

7.5 Sanitation Services Characteristics in the Gaza Strip

Wastewater treatment plants are natural monopolies, producing positive environmental and public health externalities; therefore, WWTPs are a public good. The sewer trunk and pumping stations are also public goods. In theory, this creates the incentive for the state to fund the WWTPs, trunk sewers and pumping stations, to prevent public health issues and environmental deterioration. However, the economic and political conditions in the Gaza Strip disable, and sometimes discourage, state institutions from fulfilling their role.

The high dependence on external donors further skews the incentives of state institutions; utilities are entirely dependent on aid (WHO, 2020). External aid is rarely coupled with real financial commitment from the PWA or water utilities. This means limited or no contribution to capital costs and a lack of commitment to funding the operations of donated infrastructure (Sarhan, 2017; WHO, 2020). When there is a mention of financial commitment from the utility it is not coupled with clear and realistic financial operational or rehabilitation plans (Gaza Municipality, 21.06.22). All of this suggests that utilities have limited or no incentives to allocate resources toward these infrastructures, leverage funds from private investors, or encourage citizens' contribution (Ostrom *et al*., 2002; World Bank, 2018d).

The outputs of services that are used jointly (non-rival), such as the FS/WW treatment, are often measured qualitatively (Ostrom and Ostrom, 1980); outputs are only measured as a function of inputs and their averaged potential users. For example, the number of people/HHs

that can be served given the treatment capacity. But not measuring the actual outputs of the delivered service. This makes it difficult to measure the outputs of the service and allow donors to measure their contribution and support to the recipient state by quantifying the input units, which is problematic since the mere donation of infrastructure does not translate to sustainable development (Andrews, Pritchett and Woolcock, 2017). Therefore, it is arguable that donors benefit from the high visibility of these operations, without being effectively held accountable for their long-term sustainability, or lack thereof (Ibid).

Donor incentives are not only related to benefits within Gaza but also in the wider Mediterranean basin. External donors with multilateral funding tend to make up for the supposed role of the utilities to provide public services by funding the capital costs of public goods (e.g., WWTPs, and pumping stations). Some self-interest may also push donors towards focusing on these positive externalities (e.g., environmental protection); the Gaza Strip shares the Mediterranean, a relatively static water body, with some EU countries that would be impacted ultimately by the raw WW dumping (WASH Expert #1, 05.06.22). Similarly, Israel approves more WWTPs projects compared to other sanitation projects; these protect their coastal waters, which are highly susceptible to WW dumping from Gaza (Barhoum, 2021). One interviewee remarks, "*EU donors are concerned with the treatment as dumping sewage would ultimately impact some European countries as we share the Mediterranean, same for Israel; they approve WWTPs since it directly impacts their coast, this month Zakim [an Israeli settlement] had to close their beach for leisure due to pollution from Gaza*" (WASH Expert #1, 05.06.22).

Another factor which may skew funding is scale; lower transaction costs in a small number of large operations may be preferable for multilateral donors compared to dispersed smaller projects (Andrews, Pritchett and Woolcock, 2017). Capital funding from multilateral donors is coordinated by the PWA office in the West Bank without real representation from Gaza. PWA often act as the implementing agency and remotely supervise disbursements and implementation, thus minimising transactions between donor and the receiving utility (World Bank, 2019c). It is plausible to think that this smaller number of transactions might also minimise corruption and misprocurement; an issue reported in several audit reports for World Bank projects in the Gaza Strip (World Bank, 2018a).

The 'No Contact Policy' against the Hamas government has furthered the division between Fatah and Hamas governments and skewed the incentives of their associated utilities. In order to comply with donors' policies, PWA (affiliated with Fatah) primarily channel funding to

CMWU (neutral service provider) to avoid dealing with municipalities (affiliated with Hamas). Although the establishment of CMWU was originally intended to create efficiency by coordinating service provision on behalf of the 25 municipalities of the Gaza Strip, it has become a de facto utility in its own right in response to donor policy. CMWU tends to monopolise service provision and directs its efforts to locations where they have an established partnership with the municipalities (NGO #2, 25.06.22). For instance, the long-term lagging of sewer network development in Khan Younis could have been avoided if CMWU had more control/better engagement with the Khan Younis municipalities. Similarly in Gaza CMWU does not coordinate the delivery of any sanitation service, and positive outcomes there are more a result of previous investments in the city. By contrast in Rafah, CMWU operates and oversees HH connections, sewer trunks, pumping stations and WWTPs. Sanitation outcomes are thus more impacted by political relationships than technical decision making.

The long-term exclusion of municipalities in planning and implementing sanitation projects impacts the ownership of projects and integrated planning of the provided sanitation services. It enables the monopolisation of the service provision by CMWU; currently the majority of projects channel operational and capital costs via CMWU, who handle procurement on behalf of the municipalities.

This has a particularly significant impact on the planning of secondary sewers, pumping stations and house connections. For example, contracts to construct small-scale WatSan infrastructure are issued without appropriate operational plans (INGO #2, 25.06.22; WASH Expert #1, 05.06.22). Some smaller donors, including external INGOs such as Islamic Relief, Gruppo di Volontariato Civile (GVC), and Oxfam, tend to focus their investments where "*projects have direct satisfaction for the population and the beneficiary feel the service*" which can be easily demonstrated or in line with their humanitarian mandates (WASH Expert #2, 14.06.2022). Therefore, they often prioritise projects such as sewers and house connections, which are more visible to beneficiaries than WWTPs for example and whose costs lie within the scope of their limited budgets. The smaller INGOs work exclusively under a humanitarian aid mandate and combine infrastructure projects with private goods on the HH level, such as HH sewer connections, hygiene kits, water tanks, and HH toilets (INGO #3, 25.07.22; WASH Expert #1, 05.06.22). There are often no financial commitments from the involved water utilities toward the capital and the operational costs of this infrastructure.

In Gaza private investments at any significant scale are non-existent. The protracted humanitarian crisis and prolonged occupation places severe constraints on the movement of goods and people (Weinthal and Sowers, 2019). Furthermore, in Gaza delivering basic services like WatSan is not financially viable. Municipalities' collection of the service delivery fees and cost recovery is extremely weak as 75% of the population are considered in need of humanitarian assistance and therefore unable to commit to such payment (Foqahaa *et al.*, 2020). Previous attempts at establishing a private concession contract for WatSan services in Gaza failed (Saghir, Sherwood and Macoun, 1999). Under these circumstances there has been little or no interest from private operators apart from for the provision of HH toilets. The net effect is of ongoing projectised capital investments in WWTPs, and some trunk sewers, but limited attention to long term operational costs, and to HH connections and ongoing services, which are left to a patchwork of smaller donors and organisations.

HHs in the Gaza Strip do not have incentives to contribute to public goods, especially since they are barely paying the subsidised water bill. Additionally, Gazans are not able to see tangible benefits from this infrastructure to pay for it; the WWTPs are partially functional leaving the coast heavily contaminated (GVC and PHG, 2017; World Bank, 2018b). Households, however, bear the responsibility of HH level sanitation. The HHs or their landlords, in the case of tenants, provide a one-off connection fee payment to the water utility when they build the house, to install a HH sewer connection. The HHs, or their landlord, pay a flat sanitation fee as part of their monthly water bill. Although there are no regulations to enforce connecting to the sewer network, HHs have a strong incentive to pay the connection fees because installing the sewer connection is conditional on this one-off payment. As the regulatory role of water utilities is non-existent, HHs do not have strong incentives nor financial capacity to pay the monthly sanitation fee; they would continue to benefit from WatSan services free of charge without the fear of disconnecting them.

Full-flush toilet is the main toilet technology offered by the private sector in a competitive market for HHs or their landlords. Water utilities are not responsible for installing or subsidising HH toilets regardless of the economic situation of the HH. It is not also part of the strategic plan of any of the state's institutions to engage with this part of the SVC. The Israeli violations against civilians often result in a complete or partial destruction of residential housing, subsequently destroying toilet facilities and HH sewer connections, as well as all the other infrastructure across the SVC (AIDA, 2015). INGOs provide some support to

rehabilitate these sanitation facilities. The priorities, scale of rehabilitation, and the targeted beneficiaries depend mainly on the scope of the funding organisation. For instance, Oxfam GB provide hygiene awareness, toilet rehabilitation, and support for private service providers (INGO #2, 25.06.22). Other organisations work closely with water utilities to provide sewer network rehabilitation. Table 9 summarises the perspective of the key stakeholders.

Table 9: Stakeholders' perspectives toward their contribution to off-site sanitation in the Gaza Strip (Author's own, 2023)

Service	*Household Toilet*	*Household Sewer Connection*	*Trunk Sewers*	*Wastewater Treatment*
Household	**(+) Private good**	**(+) Private good**	(-) Public good	(-) Public good
	(-) Positive externalities	(-) Positive externalities	(-) Positive externalities	(-) Positive externalities
	(+) No monopoly	**(+) No monopoly**	(-) Natural monopoly	(-) Natural monopoly
	(+) Visible[1] and measurable	**(+) Visible and measurable**	(-) Not visible nor measurable	(-) Not visible nor measurable
Private Sector	**(+) Private good**	**(+) Private good**	(-) Public good	(-) Public good
	(-) Positive externalities	(-) Positive externalities	(-) Positive externalities	(-) Positive externalities
	(+) No monopoly	**(+) No monopoly**	(-) Natural monopoly	(-) Natural monopoly
	(+) Visible and measurable	**(+) Visible and measurable**	(-) Not visible nor measurable	(-) Not visible nor measurable
Municipalities	(-) Private good	(-) Private good	**(+) Public good**	**(+) Public good**
and CMWU	**(+) Positive externalities**	**(+) Positive externalities**	**(+) Positive externalities**	**(+) Positive externalities**
	(-) No monopoly	(-) No monopoly	**(+) Natural monopoly**	**(+) Natural monopoly**
	(+) Visible and measurable	**(+) Visible and measurable**	(-) Not visible nor measurable	(-) Not visible nor measurable
Small Scale	**(+) Private good**	**(+) Private good**	**(+) Public good**	**(+) Public good**
Donors	**(+) Positive externalities**	**(+) Positive externalities**	**(+) Positive externalities**	**(+) Positive externalities**
	(+) No monopoly	**(+) No monopoly**	(-) Natural monopoly	(-) Natural monopoly
	(+) Visible and measurable	**(+) Visible and measurable**	**(+) Visible and measurable**	**(+) Visible nor measurable**
Large Scale	(-) Private good	(-) Private good	**(+) Public good**	**(+) Public good**
Donors	**(+) Positive externalities**	**(+) Positive externalities**	**(+) Positive externalities**	**(+) Positive externalities**

	(-) No monopoly	(-) No monopoly	**(+) Natural Monopoly**	**(+) Natural monopoly**
	(-) Not visible nor measurable	(-) Not visible nor measurable	(-) Not visible nor measurable	**(+) Visible and measurable**

[1] *Visibility & measurability are subjective to stakeholders directly involved.* ***(+) Positive incentive to pay/fund,*** *(-) Negative incentive to pay/fund*

Lack of Sustainable Planning

The misaligned incentives of stakeholders in funding sanitation services in the Gaza Strip have disregarded the sustainability aspect across the SVC. The design capacity of the implemented sanitation infrastructure never matches the projected demand. For instance, the North Gaza Emergency Sewerage Treatment Plant (NGEST) was designed to serve the North Gaza Governorate for the dry season only. Soon after its operation, it started overflowing as in winter; stormwater mixes with WW (WASH Expert #1, 05.06.22). In summer time, the NGEST receives 42,000 m^3 daily, its design capacity is 35,000 m^3, and the upgrading plan never became reality (WASH Expert #2, 14.06.2022). The mismatch between demand and design is especially problematic since the construction and planning stages reach 20 years in some projects, which will inevitably make the infrastructure's capacity outdated; the WWTP in the town of Bureij took 20 years to complete.

Planning sanitation infrastructure does not consider the risk factors in the implementation and operations of infrastructure due to the security and political conditions. The NGEST had significant time and cost delays due to its proximity to the 'Israeli' borders, which caused several donors to abandon the project and failed to set up an appropriate operational plan and hand it to the PWA, despite lacking operational capacity (WASH Expert #1, 05.06.22). Unsteady O&M financial resources undermine the sustainability of the implemented project; the CMWU worker explains, "*we have more than 500 facilities tanks, wells, WWTPs and desalination plant, none of them has a specific fixed financial source for O&M*" (05.07.22).

Consumable operational materials such as fuel, chlorine, electricity, chemicals, and spare parts fall short due to lack of funds and import restrictions, especially on spare parts from the Israeli occupation and Egypt borders. Municipalities cannot fulfil their financial obligations to the CMWU as their tariff collection does not exceed 30%; people are willing to pay but often have other competing needs (CMWU, 05.07.22). Thus, CMWU depends on donors' commitments and other urgent appeals to fill their financial and operational gaps. The commitments of donors vary; the World Bank covered five years of O&M for NGEST, while the UNDP, who funded the WWTP in Khan Younis, allocated zero O&M funding (Ibid). Service providers depend entirely on donors who offer unstable funds that "*can be directly affected by the political situation*" (El Swaity, 2019, p.62). Besides, donors "*got bored with funding fuel and went on installing solar panels*", which is a good environmental alternative but does not suit all facilities and locations (CMWU, 05.07.22).

The arbitrary decisions of donors in addressing O&M when service providers do not have the financial capacity nor do the co-existing governments have the sovereignty to address those needs often results in failure of projects and eventually loss of investments. An INGO worker explains, *"We prepare the facility for the ministry, but they don't have resources for O&M. After one or two months, we lose the facility. Their staff don't receive the necessary training to run it, nor do they receive their full salaries*" (25.07.22). Nevertheless, donors continue to build new WWTPs and pumping stations while, for instance, the CMWU has more 500 WatSan facilities, none of them have sustainable operational plans and resources (CMWU, 05.07.22). Service providers are burdened with "*premature load bearing*" of technology and assets, while donors question their failure to sustain those assets (Andrews, Pritchett and Woolcock, 2017, p.54). It is vital to take a pragmatic approach to improve the sustainability of the WatSan sector because the flow of aid toward new technologies, expertise, and assets does not necessarily result in long-term development (Ibid). Figure 20 summarises the key funding stakeholders and their sanitation funding priorities in the Gaza Strip.

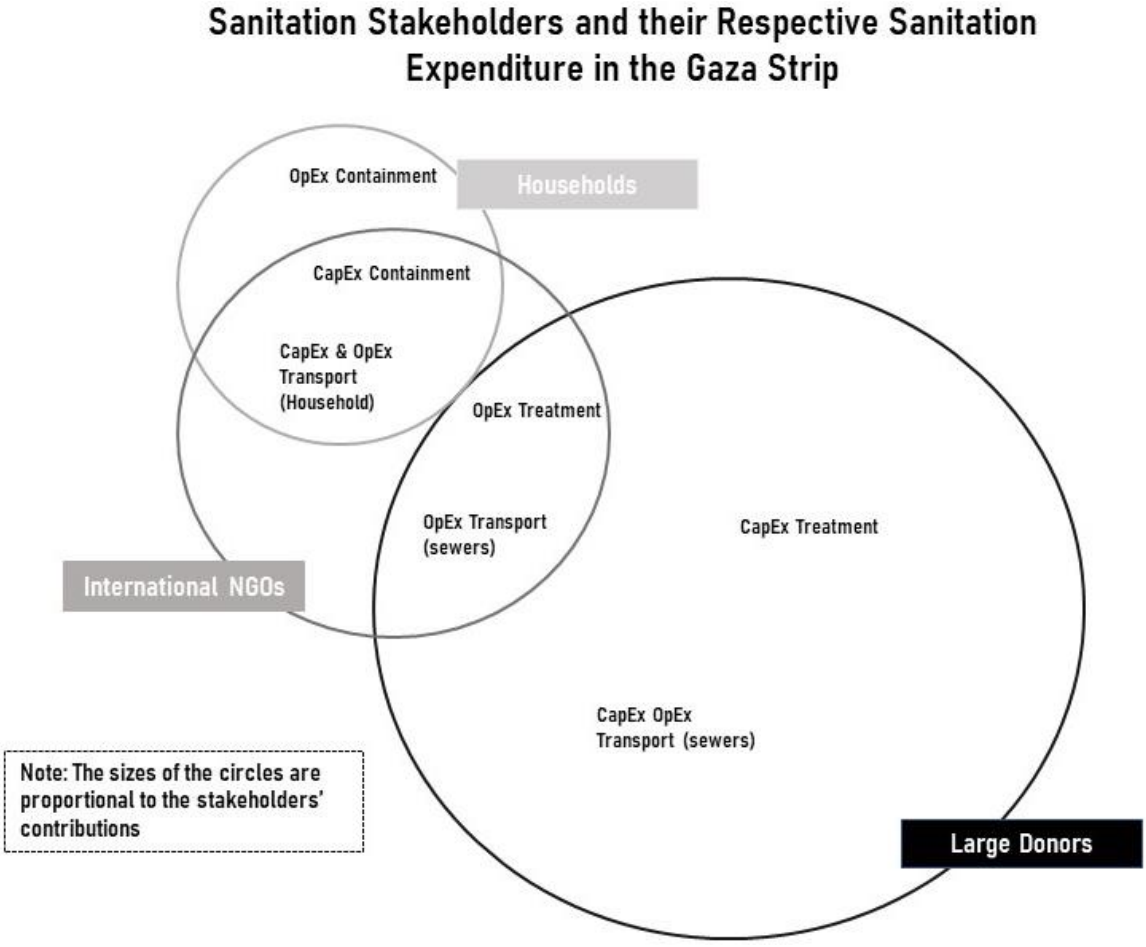

Figure 20: The key sanitation stakeholders and their funding priorities in the Gaza Strip (author's own, 2023)

7.6 Discussion

Failing to deliver sustainable sanitation services in the Gaza Strip is a result of the consistent disengagement with the Palestinians in Gaza. External aid donors constantly choose to abide by the Israeli restrictions, such as the 'dual use' ban on imports and prioritise the Israeli security concerns over enabling sustainable development. In Mourad's review of international aid to post-conflict Somalia, he found that a key hindrance for sustainability was not addressing the transboundary issues between Somalia, Ethiopia and Kenya. Although the conflict is different, it is relevant to the Gaza Strip's transboundary and borders control issue with the Israelis (2021). External aid donors choose to continue paying the "*cost of the occupation*" instead of challenging the Israeli restrictions and working with the Palestinians to achieve autonomous sustainable development (Farsakh, 2008, p.52). To 'accommodate' the intensified economic and political restrictions by the Israelis, the external aid donors ultimately instates a dependent development on the Israeli Occupations and donors (Roy, 1987; Qarmout, 2017).

Donors continue to fund WatSan infrastructure in Gaza Strip as part of their commitment to '*bailing out*' the PA (Farsakh, 2008). However, the 'No Contact Policy' against the de facto government in the Gaza Strip has detached aid efforts from the local knowledge and undermined the capacities of the Gaza Strip (Andrews, Pritchett and Woolcock, 2017; Qarmout, 2017). Similarly, the development process in Lebanon is 'dysfunctional' since the war began in 1999 as donors enforced their agendas and new policies that burdened the recipient government (Gharios, Farajalla and El Hajj, 2021). Mourad suggests that it is vital to promote transparent involvement and coordination between donors and local authorities in order to foster sustainable development in humanitarian contexts such as post-conflict in Somalia (2021). Qarmout argues that excluding the de facto government in the reconstruction and development efforts in the Gaza Strip has contributed to poor coordination and short-term focus in the various development and humanitarian sectors (2017); and violating the OECD Fragile States Principles for Engagement (OECD, 2007).

Failure of humanitarian and development aid is often addressed in even less effective responses. Andrews, Pritchett and Woolcock argue that development and humanitrain aid agency attempt to mask the failure by intervening in setting "*better policies, capacity building, cocoon particular projects or programmes"* (2017, p.71). Some EU donors have divided the Gaza Strip into geographical mandates for each donor to supposedly "*ensure a comprehensive and coordinated effort to provide WatSan services around all the Gaza Strip*

governorates" (WASH Expert #1, 05.06.22). All the public service providers in sanitation have lost autonomy over their services and became heavily dependent on external donors, who often impose their agenda and priorities which do not necessarily align with the needs of the sector (Van De Walle, 2012; Sarhan, 2017; Jebril and Deakin, 2022). A CMWU worker highlighted the arbitrary funds allocation by their donor; as CMWU agreed with the donor on a preparedness plan to use all the spare parts storage after the 2014 events in the promise that the donor would fund the storage of the CMWU afterward to ensure continued operations, but this did not translate into action despite the repeated appeals of the CMWU to the donor's community (05.07.22). A municipality worker also highlighted that in workshops with donors they collaborated in defining priorities, but those priorities never took place in reality (21.06.22). Similarly, the CMWU is struggling to access funds to meet their operational and maintenance needs, which are not visible compared to funding new assets, despite promises from their donors to provide access to much needed funding (CMWU, 05.07.22).

Donors also impact the work of the NGOs in the sector, especially organisations that lack defined priorities, as they will not challenge the 'will of donors' (Al-Daqaq *et al.*, 2004). Oxfam GB, which is part of the SAG in Gaza, does not apply for calls that do not align with their mandate (INGO #2, 25.06.22). While less established INGOs, such as Action Against Hunger (ACF) are donor-driven and highly influenced by donors' call for proposals (INGO #3, 25.07.22). This ultimately, as Salah Abdul-Atti put it, leads to "*duplication of projects, diminished quality of services, and a subjugation of the NGO leadership and vision to the donor community*" (Al-Daqaq *et al.*, 2004, p.103). For example, the Islamic Development Bank led the Gaza Reconstruction Program after the 'Cast Lead Operations' in 2008/09, established a consultant office in Gaza to define the priority projects and the benefiting regions, and then asked a partner INGO to propose projects within these areas (INGO #1, 22.06.22). This relationship with service providers has limited their autonomy and ownership, which could create perverse incentives against the sustainability of these services (Ostrom *et al.*, 2002). Perverse incentives are not necessarily because of rent-seeking behaviour – to gain more wealth or benefits without any contribution of productivity, but rather because the funds allocation does not fill the priority gaps. One WASH expert explained that the sector would welcome any project even if it were not a priority since there are severe gaps and needs across all the SVC services (WASH Expert #1, 05.06.22).

Since 2006 the nature of donor-funded projects has changed from developmental to humanitarian support (INGO #2, 25.06.22). A WASH expert argues, based on findings from

his evaluation assignment on the work of an international donor (from 2016-2020), that current WatSan projects only prevent short-term humanitarian crises and donor agencies deliberately obstruct the longevity of their projects' outcomes (WASH Expert #2, 14.06.22). Emergencies and humanitarian projects keep the work of the INGOs going, unlike achieving development (CMWU, 05.07.22; WASH Expert #2, 14.06.22). Similarly, in post-conflict Somalia, UNICEF and others donors have also prioritised immediate humanitarian projects such as water trucking and vouchers, which has are cost prohibitive compared to rehabilitating existing water systems (development nature), because this would contribute to the long-term improvement of the sector (Mourad, 2021). Such a focus creates visibility, which is often political, for the donor countries, while maintaining the status quo, or worsening it in the recipient countries. Abeer Qita argues, based on her evaluation of the USAID assistance in the Gaza Strip, that their assistance failed to reduce the economic vulnerability and dependence on external donors (2009).

Donors excessively spend on short-term humanitarian-oriented solutions ranging from hygiene kits to small-scale emergency desalination and WWTPs instead of delivering infrastructure that meets the needs of the growing population (Gaza Municipality, 21.06.22; WASH Expert #1, 05.06.22; WASH Expert #2, 14.06.22). Household level WASH aid projects such as distributing hygiene kits and toilet rehabilitation peak after an Israeli escalation, to address internal displacement and destruction of residential buildings (GVC and PHG, 2017). Some NGOs struggle to attract funding when their projects are associated with rehabilitation of existing WatSan infrastructure due to the Israeli violations and resort to small-scale humanitarian projects (INGO #1, 22.06.22). Al-Daqaq suggests that "*donors unintentionally pitted NGOs against one another in an unhealthy competition for funding. NGOs tailored their programs to align with the stated objectives of donor*" (2004).

Lack of development-oriented funding has forced the WASH Cluster to work beyond its mandate and support service providers to continue providing non-emergency WatSan services, whilst it is not equipped to such work (The WASH Cluster, 13.06.22). Besides, the WASH Cluster is restricted by the humanitarian donors' agenda "*If the humanitarian sector donors stated no fuel projects, none of the INGOs will support any fuel project*" (CMWU, 05.07.22). Donor agencies are aware that their recipient organisations are donor-driven but those donors do not seek to address this issue; an audit of World Bank projects for the Gaza Strip in 2018 concluded that the "*current projects are largely donor-driven, ad hoc emergency fashion, distorted by Israeli restrictions*" (World Bank, 2018c, p.11). The complex

humanitarian conditions require adapting the humanitarian-development-peace nexus to ensure that development efforts are sustained, as focusing on immediate crises only does not promote developing infrastructure, economy or self-sufficient institutions (Le More, 2005; Jebril and Deakin, 2022).

The sanitation sector in the Gaza Strip can be described as a fragmented sectorial regime; it consists of multiple service regimes led by CMWU, the WASH Cluster and INGOs. Currently, these service regimes are not aligned at the sectorial level regarding infrastructure, organisational mode and interaction between the actors involved (van Welie *et al.*, 2018). There is a complex set of relations, roles and responsibilities that leads to misunderstanding and conflict about roles and responsibilities. Therefore, to enable the sustainable development of the sector, a constructive transition that tackle the fragmented services and stakeholders is needed to transform the sector into a polycentric regime where multiple service regimes coexist and complement each other, and sectorial regulation fosters a complementarity relationship between services (Ibid).

The Superiority of the Israeli Occupation

Article 59 of the Fourth Geneva Convention in 1949 states that "*if the whole or part of the population of an occupied territory is inadequately supplied, the Occupying Power shall agree to relief schemes on behalf of the said population, and shall facilitate them by all the means at its disposal*" (ICRC, 1949). The impact of the Israeli occupation on the WatSan sector across the Gaza Strip has been evident since the start of the ethnic cleansing operations in 1947/48, that expelled Palestinians of 23 towns and 351 villages across Palestine from their lands and thus where 80,000 Palestinians fled into the Gaza Strip, quadrupling its population in less than a month, putting extensive pressures on its resources and infrastructure (Cheal, 1988). The Israeli occupation continued, with ruthless control over water resources prohibiting Palestinians from their self-determination in all aspects of life, which is widely covered in the literature. Since the Israeli occupation forces left the Gaza Strip in 2005, a new era of apartheid violations has emerged. The repeated escalations always leave severe destruction of WatSan infrastructure, causing public health deterioration.

International and national organisations often coordinate with the Israelis to provide protection for WatSan infrastructure. For instance, the International Red Cross coordinated with Israeli and Palestinian sides by sharing GPS locations of the WatSan facilities in May

2020 escalations with the Israelis, but this never prevented them from bombing (CMWU, 05.07.22). In the Protective Edge operations in 2014, several WatSan infrastructures were partially or completely damaged (AIDA, 2015). Israeli forces constantly destroy WatSan infrastructure even though that such infrastructure is protected under International Humanitarian Law. Funding agencies do not prosecute the Israelis forces for their violations against assets donated for humanitarian uses.

The development of the sector and the rehabilitation of destroyed infrastructure are obstructed by the tightened blockade throughout the Gaza Strip and the imposed restrictions on the import of essential building material to rehabilitation and reconstruction, which leads to loss of investments (GVC and PHG, 2017). The progression in the politics of the Israeli Occupation, such as the Oslo Accord, and the involved parties has often prioritised the "*concept of Israeli security - and not its illegal occupation - [as] the defining element of Palestinian political economic life* (Farsakh, 2008, p.43). The Israeli occupation prohibits the entry of basic building material including steel pipes 2 inches steel pipes and above as they claim it would be used for military purposes (dual use) (INGO #2, 25.06.22). The entry for non-prohibited materials (according to their classification) are delayed and they enforce new coordination arrangements systems to supposedly facilitate entry.

The GRM stopped two years ago, after the respective institutions received training and became familiar with it. The Israeli Occupation introduced a new system which would require those institutions to submit new applications and address new complications; this undermines the efficiency of the development of basic infrastructure in the Gaza Strip, as well as the capacities of the involved institutions (INGO #2, 25.06.22; CMWU, 05.07.22). Some INGOs now avoid any project that would face high restrictions, regardless of how important it is, and work on projects supplied from the local market (INGO #3, 25.07.22).

It is also vital to highlight how the Israeli Occupation is benefiting directly from aid; according to Hever, 72% of aid to Palestinians usually ends up benefiting Israeli companies and funding the occupation (Hever, 2015). This is since the Palestinians and in turn the aid process, are major consumer of the Israeli goods (de Beer, 2010). Therefore, it is crucial for donors to acknowledge how their passive role in humanitarian aid is further exacerbating the development of the Gaza Strip and Palestine in general by their sustaining economic dependency that benefits the Israeli occupation (Roy, 1987; Zureik, 2018).

Foreign aid continues reinstating the priority of Israeli security concerns over the political and economic sovereignty of the Palestinians in the Gaza Strip and West Bank. This is an "*endorsement, if not legitimacy, of the priority of Israeli security concerns over the illegality of its [Israel] Occupation*" (Farsakh, 2008, p.43). The repeated aggressions and blockade have transferred the nature of projects from developmental to humanitarian relief as an INGO worker puts "… *I don't remember that there were projects about supplying chloride or chemical materials [operational short fix] for desalination plants, or maintenance for water and WW treatment plants because the operation and maintenance was working regularly*…" (25.06.22). Some of the interviewees argue that it is a political decision to obstruct sustainable infrastructure for Palestinians in Gaza and West Bank and prevent them from having strong ties with their lands by only allowing short-term humanitarian relief instead of sustainable development in the region, to comply with the Israeli's policies to displace them (WASH Expert #2, 14.06.22). Tannira suggests that in doing so "*they [donors] implicitly give legitimacy to the latter's [Israeli] economic warfare and de-development of Palestinians in Gaza*" (2021, P.138). Donors refuse to fund key infrastructure if the Israeli do not give permission to construct it, many projects have faced more than 10 year delays because of the Israeli delays in issuing permits (CMWU, 05.07.22). For example, the design of the Middle Area and Gaza central WWTP finished in 2004 and was supposed to open in 2007 but due to the delays in permits, the fund went to operational costs for other projects (WASH Expert #2, 14.06.22).

7.7 Conclusion

External aid is crucial to providing sanitation services in the Gaza Strip. The population of the Gaza Strip have been living in a protracted humanitarian crisis due to the prolonged Israeli occupation, its repeated armed escalations, and movement restrictions on goods and people, contributing to the de-development of the Gaza Strip's economy and dependency on external aid. The internal division also contributes to inefficiencies of basic services delivery. However, the agenda of external aid stakeholders in the Gaza Strip and sanctions against the de facto government has exacerbated division and hindered potential reconciliation of two ruling political parties even at the level of service provision.

This chapter sheds light on a vital factor of the stagnant progress and aid efforts in sanitation service provision in the Gaza Strip. It contributes to the literature on understanding aid effectiveness in protracted humanitarian crises, post-war and conflict areas with chronic political complexity towards basic services such as water, sanitation and health. This case

provides evidence by using the concepts of institutional economics to understand the dominant role of external donors in shaping service provision, state capability, and infrastructure sustainability in recipient countries.

It is plausible that the incentives of external aid in funding capital expenditure of assets and short-term (emergency-oriented) projects without ensuring its sustainability is motivated by years of donors' policies that enable the de-development of the Gaza Strip while continuing paying the *cost of the Israeli occupation* through aid. It is vital to include the Palestinian service providers and the other government bodies in planning and promoting their autonomous engagement to sustaining their ownership of the implemented aid projects.

Chapter Eight: Concluding the Thesis

8.1 Introduction

Ensuring the effective and equitable delivery of sanitation services involves addressing the diverse needs and motivations of various stakeholders. This can be challenging, as the funding and provision of these services often involves trade-offs between public and private involvement. Achieving universal and equitable access requires the safe management of faecal waste across the sanitation value chain (SVC), including emptying, treatment and disposal and not just providing toilets. This means that for the entire SVC, both hardware and software are required to provide integrated service. This thesis explores how the additional element of institutional barriers and enablers can be critical in understanding why efforts to extend sanitation may be undermined. This PhD aimed to explore and fill the knowledge gap about how the institutional and economic characteristics of sanitation services influence the incentives of the stakeholders to fund or provide it. It does so by offering a sophisticated analysis of the characteristics using real-world cases.

The four case studies presented in Chapter four, five, six and seven have added nuance to the findings of Chapter two by investigating incentives in specific contexts. These case studies therefore answered the first research question of the study: ***What are the incentives associated with allocating funds toward sanitation services?*** and formed the basis for answering the second research question: ***How do stakeholders' incentives interact with the institutional and economic characteristics of sanitation services?*** The last research question: ***To what extent can understanding stakeholders' incentives explain the challenges of delivering sustainable sanitation services?*** is addressed in this chapter as I reflect on the methodological contribution of the thesis in the light of its high-level findings.

Chapter four, a peer-reviewed published article, has presented the formative case study of the thesis and provided an example of the competing incentives in allocating funds toward sanitation. It evaluated the functionality of four faecal sludge treatment plants (FSTPs) in Bangladesh funded by the Asian Development Bank and implemented by the Government of Bangladesh in four secondary towns within a broader campaign to promote faecal sludge management practice around the country. The formative study concludes that the functionality of state-owned FSTPs in Bangladesh varied based on the available funding and capacities at the local government level, ownership of the involved stakeholders at the local government level, and their incentive to sustain those services which stem either from political visibility (local government sanitation champions), or environmental protection and economic gains (partner private contractors and international and local non-governmental

organisations (NGOs)). The chapter also highlights the importance of the integrated provision of the upstream services across the SVC – such as faecal sludge containment, emptying, and transportation – in achieving the sustainability of faecal sludge treatment services. In addition, the downstream elements of the SVC do not even work if the upstream parts have not been provided effectively.

The subsequent cases presented in Chapters five, six and seven examine this question from the perspective of attempts to provide sanitation services across the entire SVC. In those case studies, I utilised the concepts presented in Chapter two, such as the varying perceptions about sanitation, roles, and responsibilities to fund and provide it and the spectrums of economic characteristics of services across the SVC, to systemically draw relations between the economic characteristics of sanitation services and stakeholders' incentives.

Chapter five analysed a case of the private provision (Sanergy Enterprise) of sanitation in Nairobi low-income settlements (LISs) in Kenya. This case illustrates the barriers to the partnership between the private sector and local governments due to power dynamics, conflicting incentives and differing priorities. It further shows that end users of services may also have conflicting interests and incentives. The Nairobi case contributes to the debate about private sector participation in delivering basic services. Small scale providers such as Sanergy have an 'altruism' driver but if we think of them as purely private service providers their incentives are purely for profit which would raise the prices and make them unattractive option for the users' on the demand side.

Although the role of the private sector can be useful in some contexts to fill gaps in the skills and capacity of the state, it is hampered by the economic conditions in low-income settings. Households have an incentive to have improved household services but little else downstream of the SVC. Wholly market-based safely-managed sanitation services provision does not appear to be financially viable without the support of the state. However, states with low budgets toward water and sanitation (WatSan) often lack incentives to support or collaborate with the private sector.

Chapter six considered the case of state sanitation provision to LISs in Cape Town, South Africa. It explores the socio-economic and political features of Cape Town and how these influenced perceptions toward sanitation as a public good. Perceptions influence the incentives of key stakeholders not only to fund and provide sanitation but also to advocate for it as part of social activism. In contrast to the case of Nairobi, the power dynamics between

stakeholders in Cape Town facilitated outsourcing (but local government funded) of sanitation services to private providers; systems have been established to govern and maintain such involvement. However, the provided services are of a temporary nature to prevent local unrest and to win political games among the two opposing parties in the country; substantial outsourcing of sanitation has thus undermined the potential to provide long-term solutions. Governments have a set of theoretical incentives to improve overall well-being and the environment through investing in sanitation. However, these seem to be cloaked/masked by other incentives relating to visibility and political expedience.

Chapter seven interrogated a different context of donor-led sanitation services in the Gaza Strip, Palestine. It unfolds the key incentive barriers to sustainable development efforts supported by external aid donors. The preferences and agendas of external donors have shaped the delivery of sanitation in the Gaza Strip; there is a clear focus on the public good and externalities of sanitation, as manifested in their preference to finance the wholesale segments of the SVC. International funders have the same theoretical incentives as governments, but for them too, the incentives are cloaked by other considerations of visibility and accountability.

As the political leadership and the government and non-government organisations in the Gaza Strip lack sovereignty and autonomy, their role in shaping and contributing to sustainable service delivery across the Gaza Strip. External aid is curtailed. Nevertheless, this type of leadership would be crucial to providing sanitation services in the Gaza Strip, contributing to the long-term development process. The status quo of humanitarian-oriented programmes constrains efforts at sustainable long-term provision and contributes to the internal political division and the human rights violations of the Israeli Occupations against the Gazans.

In special cases, the historical/political context dwarfs other considerations. Thus, for example, in South Africa, the apartheid history changes people's understanding of their rights and demands. It drives up household demand but does not change the incentive picture for the non-private parts of the services. In the Gaza Strip, this effect is different but much bigger since any users or service providers lack confidence that their investments are safe – this means there is a skewed reliance on external funding. Then the drivers of visibility and accountability come into play again. In conclusion, based on the four case studies, there are two generalisable findings, the incentives for good household services are often quite well aligned between stakeholders, but the incentives for all other parts of the system (the wholesale part) are conflicting. There is little evidence from the four case studies of

conditions where the design and delivery of wholesale services is well aligned with retail services; Sanergy perhaps does relatively a little better in this space, but the investments may not be robust and are not clearly embedded in a long-term institutional plan.

This final chapter concludes the thesis by summarising the key research findings in relation to the research aims and questions and discussing the value and methodological contribution thereof, which was accepted in the form of working paper at the first WASH Economics Conference in March 2023 at the London School of Hygiene & Tropical Medicine. It also reviews the limitations of the study and propose opportunities for future research development actors.

8.2 The Methodological Contribution of the Thesis

This thesis offers a complex analysis of the political economy of sanitation and its services across the SVC in doing so it goes beyond simple PEA approaches criticised by Jones and other scholars for offering "*over-simplified and sanitised understandings of politics and institutional change, in the broad belief that consensus can be built towards win-win situations that are beneficial for all*" (2015, p.67). It has also been criticised for not examining how *"incentives and related political processes really work in relation to the nature of decision-making*" (Ibid, p.68). A key shortcoming of PEA is it failure to offer practical and actionable insights for practitioners (Harris, 2013).

This thesis makes a methodological contribution by overcoming these shortcomings through using PEA approaches to examine real life case studies. The research extends PEA by incorporating other institutional economics concepts to explore the relationship between stakeholders' incentives and the institutional and economic characteristics of basic services. This PhD aligns with Harris's suggestion that applied PEA would analyse a particular problem and narrow down its scope of analysis and make it relevant to practitioners (Harris, 2013).

The service characteristics analysis segment in the thesis (Chapter two), is directly associated with the series of studies and papers commissioned by the Overseas Development Institute. It builds particularly on Batley and McLoughlin service characteristics framework which encompasses the work of Keefer and Khemani, Pritchett and Woolcock, Bakker *et al* and others (2003; 2004; 2008). My analysis contributes to Batley and McLoughlin's research recommendation to assess *"how far characteristics can be seen as intrinsic factors, and how far they vary in their political effects by context"* as according to them some of the

characteristics – such as externalities and targetability would benefit from further empirical research (2015, p.283).

Most studies related to utilising the service characteristics framework mainly use it to address a basic services as a whole such as education and health services (Batley and McLoughlin, 2015). This might be acceptable for some services since the activities of the service are homogeneous (in terms of scale and targeted users) but sanitation is not homogenous. The toilet service is experienced at a household or housing plot scale, the target users are the public; the transport and treatment services are experienced at the whole city scale, or a couple of towns, and the target users are usually pit emptiers, farmers (purchase reuse products) and other actors interested in the safe treatment, disposal or reuse of human waste.

The briefing note of the sanitation sector , delivered by Mason, Batley and Harris (2014), that used the Batley and McLoughlin (2015) framework, summarised in Figure 4 did not use all the categories of framework as the authors' purpose was only to test its relevance to sanitation. They focused on some of the categories relevant to the cases they covered such as the potential of collective action in understanding the service demand and market-based approach to supply, visibility of failure as an approach to drive incentives and the sensitivity of changing the incentives of elites, and the role of households in sanitation provision taking the 'economic logic' and prevailing 'social norms' of service provision (Ibid). In addition, the briefing note used some examples of sanitation programmes such as Community-led Total Sanitation in Bangladesh and Total Sanitation Campaign in India that only focus on household toilets and use promotion plus subsidy to scale it (Ibid). My study is seeking to understand the incentives in delivering toilets plus transport and treatment services in urban places, requiring coordination of private household scale services with essentially public city scale services.

Therefore, the key conceptual contribution of this PhD is extending the service characteristics analysis across the whole sanitation value chain and across all the key stakeholders while taking into consideration the governance context. Putting emphasis on the governance context in my analysis has proved its influence on defining the economic characteristics of each service across the sanitation value chain and the consequential incentives of each stakeholder. It has therefore, using multiple case studies, shed the light on the dynamic element of defining the economic characteristics of sanitation. Consequently, it provides evidence that addressing the funding gaps for sustainable basic services is achievable, taken there is a constructive change in the governance context. A key challenge in using the Batley and McLoughlin

service characteristics framework is that it is built on the notion of public provision of service. This is a valid assumption since most basic services such as education, health, WatSan remain the responsibility of the public institutions (as for example expressed in the constitutions of both South Africa and Kenya). The challenge arises since water and sanitation services are provided by a range of providers in any one area. As explained earlier, the sector regimes categorisation by van Weli*e et al* sheds light on the importance of understanding the dynamics in coexisting services in order to manintain intergrated and sustainable services (2018). For instance, toilets may be private household toilets, privately-owned public toilets, government-owned public toilets, CBO-run public toilets, and other arrangements that communities might collectively arrange.

Similarly, construction and/or management of both transport and treatment can be outsourced to private providers, or taken up by non-governmental organisations, as well as directly delivered by the state. The arrangements are often informal, particularly in complex urban settings such as LISs. This complexity, and heterogeneity between different cases make it hard to generalise how the characteristics of sanitation would impact the incentives of the stakeholders. For instance, the user's capacity to organise demand is irrelevant when the service is privately provided as the provider is not obliged to meet such demand without considering their own opportunities and challenges. In contrast, the collective action to organise demand is critical as seen the case of public provision in Cape Town taking the expected role of the state to provide the service. More importantly, there are political issues beyond the conventional political salience highlighted in the service characteristics framework between the state and its citizens. The involvement of the private sector might involve political forces; for example, Sanergy is collaborating with local political leaders and getting their buy-in to increase the legitimacy of their business model. Finally, I have used the framework to examine imperfect systems that have developed mainly without oversight from the government – the very lack of government leadership means that the arrangements and the actors are not well coordinated and are working in chaotic, fast-moving conditions. So the, analysing them was not as 'clean' as analysing, for example a well-established national education system.

This thesis attempted to provide a systematic use of the service characteristics framework by analysing the characteristics of each segment of the SVC in each case study (Chapters five, six and seven). Nevertheless, applying all the service characteristics listed in the four categories of the framework proved inapplicable to the studied contexts. For example, in the

demand-related characteristics such the territoriality – the proximity of users to each other and to the service – was evident as a key factor to the collective action efforts in Cape Town to pressure the City of Cape Town (CoCT) to extend sanitation to the citizens living in LISs (Chapter six). Conversely, the territoriality of the service was not relevant in Sanergy case (Chapter five) because the user is not involved directly in the provision of the service as his/her landlord is in charge of providing it. The visibility and attributability – task-related characteristics were relevant to donor-dependent services in humanitarian context coupled with political complexity in the Gaza Strip (Chapter seven) and state provision in Cape Town (Chapter six) unlike market-based provision in Sanergy case (Chapter five). This is potentially due to the highly political nature of the service in the later cases.

8.3 The Value of Sanitation

As elaborated in Chapter two, sanitation entails an array of wholesale and retail services essential to achieve safely managed services across the SVC. Unlike consumable goods, this heterogeneous set of services requires coproduction between the provider and the user (Ostrom and Ostrom, 1980; Joshi and Moore, 2004). The involvement of several stakeholders in coproduction has a potential hazard of conflicting priorities and incentives. This is especially the case in some of the services (mostly wholesale sanitation) as they do not constitute a private good to the user. The incentives of certain stakeholders (e.g., users and service providers) can only be regulated and governed (issues such as rent-seeking, monopoly, or information asymmetry) by the state through financing tools, laws, and regulations.

Some donors, NGOs, and governments often assume when they subsidise a segment in the SVC, in the form of capital expenditure for wholesale infrastructure, that the other stakeholders will fulfil the remaining requirements to operate and sustain the service throughout the SVC. This assumption often does not materialise, especially in light of limited resources. For instance, in the case study from Bangladesh (Chapter four), funding FSTPs was a standalone unplanned initiative from the Government of Bangladesh and Asian Development Bank to sensitise local governments in secondary towns about the concept of faecal sludge management with little regard to the status of the prior services across the SVC (e.g., containment and FS emptying and transport). The functionality of the studied four FSTPs varied immensely based on the status of sanitation services, political willingness, and capabilities of the involved municipalities (local government). It is plausible that investment

loss in a project, such as the studied FSTPs, could have been eluded by considering the incentives and capabilities of the recipient municipalities.

A key finding from the FSTPs case study is that sanitation is not seen as an integrated system that is comprised of several segments (portrayed by the SVC). Thus, stakeholders have incentives to put resources into the *segments* that they believe are worth their investment. The value of those segments comes from how sanitation is perceived. The four case studies presented in the thesis (Chapter four, five, six and seven) showed how stakeholders perceived sanitation differently and how their contributions varied toward providing it. Aligning all these different incentives requires a strong leadership from the state to put in place processes to align them. However, states often cannot do this or are not willing as they do not see it as their role.

As incentives are shaped by the perceived benefits of contributing to a service, this study assessed those benefits by linking them to the service characteristics (economic and institutional) of each segment in the SVC. Each stakeholder is motivated by a set of benefits that fits their priorities. For example, the environmental protection (a community-level externality) aspect in WW treatment drives the incentives of NGOs and donors who prioritise conservation and environmental protection to contribute to treatment plants. The same donors might have fewer incentives to fund toilets and sewer networks since the environmental protection is not explicit (compared to treatment) in advocating for it. The case study of the Gaza Strip shows how externalities, represented by wastewater treatment plants (WWTPs), due to donors' concerns about the environmental degradation of the Mediterranean Sea overshadow the preceding segments of the SVC and their combined individual-level benefit(s). The focus on WWTPs demonstrates the importance of scale and type of benefit for external donors in defining funding priorities.

Visibility of the services is a crucial driver for external development actors such as development banks and INGOs (Mumssen, Saltiel and Kingdom, 2018), like the case of the Gaza Strip and the four FSTPs studies in Bangladesh. Funding large infrastructure such as FS/WW treatment plants provides high visibility for the donor. Physical outputs can be easily measured and reported, although there is limited, or absent, measurability of service outputs (Ostrom and Ostrom, 1980; Andrews, Pritchett and Woolcock, 2017). Consequently, donors are presented as leaders committed to supporting recipient states even when their efforts are not contributing to long-term development. Service levels in the case study from Palestine and Bangladesh can be categorised as open defecation on the sanitation ladder since FS/WW

end in open bodies of water or the streets. Both cases would have benefited from local capacity building and financial assistance to promote effective FS/WW collection and transport prior to treatment (Trémolet and Rama, 2012; WSP, 2015).

Access to toilets is directly related to individual-level benefit(s) such as privacy, dignity, prestige, and the ability to exclude others from using them (Mason, Batley and Harris, 2014). Such benefits drive individuals and human rights organisations to contribute to it not necessarily through funding only but also through social activism and accountability, as in Cape Town. Activists pressuring the City of Cape Town to provide equitable access to toilets in Cape Town is a matter of resistance to protect the collective dignity of the black and coloured population. Activists are concerned with building toilets only, and not the other segments of the SVC, because toilets are associated with dignity whereas treatment is not perceived this way.

The contrast between the case studies of Cape Town and Nairobi represented by the role of the state, and citizens in providing toilets is explained by the different perceptions about its value. In Cape Town, citizens, regardless of their housing status, are aware of their right to sanitation and consider it a public good that the CoCT is expected to provide free of charge. Therefore, collective action and social activism have improved access to sanitation in the LISs of Cape Town. This perception prompted citizens to pressure the City and continually protest and reject their temporary sanitation solutions that undermines the basic right to sanitation guaranteed by the Constitution. This sense of entitlement comes from years of oppression and dehumanisation of the black and coloured South Africans during the colonial and the apartheid period. The black and coloured population were pushed away from urban places and were forced to use buckets, at the same time the white population enjoyed government-provided sewered sanitation. The capacity to organise collective stems from the collective history of self-organising and homogeneity of the population (Ostrom *et al.*, 2002).

While the same basic right is spelt out in the Constitution of Kenya, it is not sufficient to create pressure on the state to extend sanitation to LISs. The social norms related to managing one's faecal waste makes the residents of LISs feel not worthy/unfit to receiving such service for free from the NCC and believe that it is each person's responsibility to provide sanitation for him/herself (private good). Besides, the social dynamics in the LISs of Nairobi does not foster collective action. The population in LISs Nairobi is highly transient; particularly people may be rehoused or moved by politicians to adjust electoral votes. The housing arrangements

also commonly involve a landlord who controls the housing assets and makes the decision and arrangements to provide basic services to the tenants.

The presence of 'cartels' and their political connections also makes the distribution of power dynamics and assets in the settlements unequal, undermining the potential of collective action in those areas (Ostrom *et al.*, 2002). In summary, the reluctance of the NCC to provide sanitation to LISs, despite their proximity to the trunk sewer in Nairobi, is partially due to the limited pressure on them arising from collective accountability from citizens in LISs.

The non-existent pressure at the NCC to fulfil its duty to provide sanitation for the residents of LISs creates a space for businesses, cartels, and NGOs to provide or hinder the delivery of sanitation services. Unlike the CoCT, the NCC is not interested in outsourcing or delegating sanitation services in LISs, as shown from their interaction with Sanergy. In addition, the NCC does not have the appetite to encourage the private sector participation since this would require financial commitments and changes in perspectives about the technology choices and the ownership of assets and the financial gains from such work for the NCC.

Another key difference between the incentives in the case of Cape Town and Nairobi is the interest to own the assets of sanitation infrastructure. CoCT outsource part of the service (chemical toilets) to a private contractor and seemingly have no interest in purchasing assets or in direct provision. In contrast, part of the reason for the lack of interest from NCC to invest in Sanergy, is that Sanergy will not satisfy the County's interest to own the assets of the service in Nairobi.

Sanergy, an international organisation that promotes itself as a social enterprise, provides CBS in the LISs of Nairobi. Sanergy is not in fact a pure private entity as they use aspects of both philanthropy and business to promote themselves and to raise funds. It taps into the individuals-level benefit(s) from toilets and the basic human right to sanitation when fundraising for their non-profit entity. Sanergy also taps into the community-level benefit(s) of environmental protection and circular economy potentials of the faecal sludge treatment and reuse business to attract investors to their for-profit entity.

8.4 Conclusion

Extending sanitation services entails the provision of heterogeneous retail and wholesale sanitation services to ensure integrated delivery of services across the SVC. Those services require the involvement of several stakeholders of varying priorities and capacities. Providing equitable and sustainable sanitation services thus requires understanding and managing the

competing preferences and incentives of these stakeholders toward sanitation. Several scholars argue that public funding should be allocated to non-excludable services (predominantly public goods) and leave excludable services for the end user to pay (Cornes and Sandler, 1986; Mumssen, Saltiel and Kingdom, 2018). However, the incentives of stakeholders interact sometimes adversely with the nature of goods and other service characteristics. This PhD contributes to the debate about the role and responsibilities of key stakeholders in sanitation by investigating the characteristics of the various sanitation services and their relationship with the incentives of stakeholders to promote sustainable and equitable services.

The PhD discussed the issue of incentives using four qualitative case studies in Bangladesh, Kenya, South Africa and Palestine. It illustrates and fills the knowledge gap of understanding the varying perspectives of key stakeholders in defining sanitation as a service (its institutional and economic characteristics) and, in turn, the respective responsibilities to provide and maintain it. Structural factors such as the historical and political context, existing institutions and stakeholders often dictate the level of involvement of each stakeholder, particularly in delivering basic services to marginalised communities in LISs. Some government and non-government organisations often subsidise parts of the service to promote the involvement of end users. In addition, considerations such as the human right to sanitation, environmental protection and circular economy also influence the incentives of stakeholders of financial capacity. Nevertheless, the design of such subsidies often does not align with the prevailing narratives and capabilities of the other stakeholders to invest in sanitation. Therefore, it is vital to depart from the purely economic logic in funding sanitation to a more sound allocation of funding and financing tools toward sanitation to leverage the participation of all stakeholders toward sustainable and equitable service, especially for low-income communities.

8.5 Policy and Practice Implications

The lack of aligned incentives among stakeholders impacts the sustainability and effectiveness of funds allocated, management, regulation, and institutional development of sanitation. The analysis of service characteristics and their impact on stakeholders' incentives offers a diagnostic tool to policy makers and development institutions who are in position to make fund allocation decisions, to assess the longevity of their funding and its capacity to leverage enough and well-allocated needed funding across the SVC from other stakeholders. Using this diagnostic tool at the early stage of planning a sanitation project, or when

considering creating a sanitation master plan for a city would help predict the potential funding gaps across the SVC in the specific context. This thesis does not provide generalised conclusions about stakeholder incentives (e.g., as Cornes and Sandler argue that the state would fund non-excludable public goods and natural monopolies in sanitation (1986). Instead, it departs to a more pragmatic view about the biases and selectivity of stakeholders.

This PhD might conclude with some pessimistic findings, similar to the findings of the presented cases; sanitation will probably remain, at least in the near future, a less attractive investment area for many stakeholders. However, these findings can help avoid investment losses if taken into consideration at the policymaking and planning stages. Understanding and addressing the incentives of all the key stakeholders toward contributing to a particular service would help identify the funding (and other inputs) gaps as well as the existing opportunities of maintaining these services during their whole life span throughout the SVC.

Therefore, it is the responsibility of policymakers to allocate public funds to 'maximise public benefits' shared by everyone (Evans, van der Voorden and Peal, 2009) while promoting and regulating the contributions and investments of other stakeholders, including users, external donors, and the private sector. Although this might imply allocating public funds toward public goods, this should not be the case in some contexts, where users and the private sector do not have the incentive to contribute to private goods crucial for the general well-being of society. Regulatory and financing tools, including targeted subsidies on the demand or the supply side, could be used to shift incentives and increase the chance that these could be aligned, resulting in coordinated delivery of services along the entire SVC.

In order to achieve the intended collective gains from sanitation, policymakers would need to assess funding priorities in a holistic manner (services throughout the SVC) and in light of the progress level in sanitation. (e.g., where a town or a country is located at the sanitation ladder). For instance, deciding to allocate funding to FS/WW treatment plants, although it is a natural monopoly of high externalities, should not be a priority for the state when some communities lack access to toilets, sewers or safe FS collection and transport. Although this diagnostic does not quantify funding gaps, it can add nuance when combined with cost assessment tools such as Climate and Cost in Urban Sanitation Tool developed by the WASH Research Group, School of Civil Engineering at the University of Leeds (CACTUS, 2022), cost-benefit analysis, and WTP studies.

Future Research

This thesis used cross-sectional case studies to assess stakeholders' incentives toward providing public health services to low-income communities. However, providing historical nuance with longitudinal case studies would offer more insights about the changing incentives and agendas in the development sector; especially when addressing the needs of the poor. There is a need to understand more the impact of historical distortions such as apartheid on the experience of sanitation services delivery.

The historical development of public health services in China, Latin America and Great Britain can provide important insights of how economic incentives shift the state's incentives over time. In the 19th century Great Britain, the economic concerns of losing the labour force due to dire public health housing conditions was the key driver for to improve sanitation services in the low-income neighbourhoods in London (Hamlin, 1998). Whilst currently the UK water companies are considering disposing of raw faecal sludge in water bodies, which might start to resonate with the 19th century Great Stink in River Thames. Such move was only considered after leaving the EU and breaking away from its strict environmental regulations that ban such practice. Future research can take the form of a comparative study between the historical development of public health services to date in Britain and countries who are witnessing economic growth like Kenya and Zimbabwe. A comparative analysis can also be implemented between the incentives difference between funding public health services and climate finance, which is gaining more attention worldwide.

In relation to PEA, there is a space for development to modify its language and concepts to work better for infrastructure sectors such as sanitation; the current PEA literature still fails to deal effectively with the practicalities of building and operating complex infrastructure such as sanitation.

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Appendices

Appendix 3.1

Consent Form

UNIVERSITY OF LEEDS

I hereby consent to take part in the research project titled:

The Political Economy of Sanitation: An Exploratory Study of Stakeholder Incentives in Delivering Sanitation

Please read the following statements and tick the box next to it if you agree

I confirm that I have read and understand the information sheet explaining the above research project and I have had the opportunity to ask questions about the project.	☐
I understand that my participation is voluntary and that I am free to withdraw anytime and without there being any negative consequences. I understand that I cannot change my responses or withdraw from the research once her the first paper is submitted for publication (by 15/04/2022). In addition, should I not wish to answer any question or questions, I am free to decline. Previously provided data will be safely deleted with the confirmation from myself or authorised person on my behalf.	☐
I understand that the data collected from me may be stored and used in relevant future research for limited 2-3 years' time; and I understand that the data I provide may be archived at https://archive.researchdata.leeds.ac.uk/ and the researcher's personal computer or recording device.	☐
I understand that relevant sections of the data collected during the study, may be looked at by individuals from the University of Leeds	☐
I agree to take part in the above research project and will inform the lead researcher should my contact details change.	☐

Name of participant	
Participant's signature	
Date	

Name of lead researcher	Mariam Zaqout
Signature	
Date*	

*To be signed and dated in the presence of the participant.

Once this has been signed by all parties the participant should receive a copy of the signed and dated participant consent form, the letter/ pre-written script/ information sheet and any other written information provided to the participants. A copy of the signed and dated consent form should be kept with the project's main documents which must be kept in a secure location.

Appendix 3.2

Information Sheet

UNIVERSITY OF LEEDS

The Political Economy of Sanitation: An Exploratory Study of Stakeholder Incentives in Delivering Sanitation

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Principle Investigator: Mariam Zaqout **Name of Project:** PhD Research Project

Organization: University of Leeds

Introduction

I am Mariam Zaqout, studying at the University of Leeds, UK. I am doing a PhD dissertation about the funding incentives to fund sanitation services. You are being invited to take part in this research because we feel that your experience as a Governmental/ NGOs/expert can contribute much to our understanding about funding challenges and funds allocation problems that contribute to funding inefficacies toward sanitation services. You do not have to decide today whether you will participate in the research. Before you decide, you can talk to anyone you feel comfortable with about the research.

Purpose of the research

Funding gaps is a persistent issue in sanitation services and especially in services that require high operational expenditure. The research aims to understand the incentives behind funding the different components of sanitation services and how we can better manage these incentives.

Your participation

If you agreed to participate, you will be asked to participate in an interview (online), were you be asked within your experience about different sanitation stakeholders' priorities and plans to improve sanitation including your organisation. The interview will last no more 1 hour, and voice recording will be in place after asking your permission.

Risks & Benefits

There is a risk that you may feel uncomfortable talking about some of the topics. However, we do not wish for this to happen. You do not have to answer any question or take part in the

discussion/interview if you feel the question(s) are too personal or if talking about them makes you uncomfortable. There will be no direct benefit to you, but your participation is likely to help us find out more the challenges of allocating financial resources among the different stakeholders.

Confidentiality

Nothing that you tell us as part of this research will be shared with anybody outside the research team, and nothing will be attributed to you by name. All names will be anonymised. The recordings of interviews will be stored on an encrypted archive and deleted from the audio recorder following interviews. Consent forms and interview notes all will be in softcopy form and will also be saved on the same encrypted archive stored for 3 years. Transcripts of interviews will be de-identified so that no one will know personal details of the interviewee or their place of employment and these de-identified transcripts may be submitted to the University of Leeds Research Data Repository. The knowledge that we get from this research will be shared with you and your organisation before it is made widely available to the public. We will publish the results so that other interested people may learn from the research.

Right to Refuse or Withdraw

You do not have to take part in this research if you do not wish to do so and choosing to participate will not affect your job in any way. You have the right to stop participating in the [discussion/interview] at any time that you wish. I will give you an opportunity at the end of the interview/discussion to review your remarks, and you can ask to modify or remove portions of those, if you do not agree with my notes or if I did not understand you correctly. You will have the right of withdrawal for your data until I submit research for publication (15th April 2022)

Who to Contact

If you have any questions, you can ask them now or later. If you wish to ask questions later, you may contact me or my supervisors:

Mariam Zaqout Phone number: 0044(0) 754 851 2154	Prof Barbara Evans Phone number: 0044(0) 113 343 1990	Prof Anna Mdee Phone number: 00 44(0)113 343 1786

Email address:	Email address:	Email address:
cn17mdaz@leeds.ac.uk	B.E.Evans@leeds.ac.uk	A.L.Mdee@leeds.ac.uk

Appendix 3.3

Code Book for the Thematic Analysis of the Four Case Studies

a. Bangladesh Case Study Codebook

Category	*Description*
External development actors *(theme)*	The impact and influence of external stakeholders on the processes and planning of sanitation services.
Cost recovery *(code)*	Recovering cost of faecal sludge management through service fees collection and sale of reuse products (e.g., organic fertilisers).
Political will *(code)*	The interest and capacity of political leadership to deliver or support the development of a sector or service to their constituents.
Lack of integrated FSM *(theme)*	A fragmented service delivery within the sanitation value chain of FSM creating a gap between services dependent on each other, e.g., failure of safe mechanical faecal sludge emptying due to poor containment.
Poor containment *(code)*	Undermined faecal sludge containment due to unlined pit latrines and septic tanks infrastructure.
Local capacity *(code)*	Limited technical knowledge and skills of the human resources in the service areas.
Low mechanical emptying uptake *(code)*	Limited demand and willingness to pay for mechanical emptying and transport since the other options of manual emptying are often cheaper.
Ad hoc projects *(code)*	Unplanned and spontaneous implementation of sanitation projects without prolonged engagement with the grassroots such as the local leadership and their service provider.
Underused FSTPs *(code)*	FSTPs that are not used to their full capacity due to low influent faecal sludge.
Remote service *(code)*	Limited geographical proximity of the service to the users and the other related services.
Unbalanced partnerships *(theme)*	Lack of inclusive decision-making process among the relevant stakeholders such as external donors, national and local governments.
Devolved governance *(code)*	Transfer of power from the national government of the state to the local governments.

b. Nairobi Case Study Codebook

Category	*Description*
Market-based sanitation *(theme)*	Sanitation services provided competitively in LISs and its impact on shaping the long-term service provision.
Cost recovery *(code)*	Recovering cost of faecal sludge management through service fees collection and sale of reuse products (e.g., organic fertilisers).
Philanthropic donors *(code)*	Donors' role in promoting market-based sanitation as a supposed solution to increase cost-recovery and financial sustainability of the offered services.
Non-profit services *(code)*	Services provided free of charge or highly subsidised to promote the collective good of the served society.

Cartels *(code)*	The role of cartels, organised groups and individuals who have strong ties with political leaders, on the service delivery and participation of other actors in the space of sanitation services.
Power relations *(theme)*	The impact of the social and political dynamics of the society on shaping the service provision in LISs, the commitments and participation of new stakeholders such as users and providers in the sector.
Transient population *(code)*	Politically driven relocation and movement of a certain population between rural and urban spaces.
Container-based sanitation *(code)*	Onsite sanitation technology that involves collecting, and sometimes separation of human waste, into containers that are regularly collected, emptied and replaced with fresh ones. This technology tries to address the space issue when emptying trucks can access roads to empty the conventional pit latrines and septic tanks.
Temporary sanitation *(theme)*	Sanitation technologies that primarily are for short-term use (e.g., container-based sanitation on camping sites) and becoming widely used as a quick fix to a serve society in low-income settlements.
Modern infrastructure *(code)*	Sanitation infrastructure that are widely used in high-income countries which involves zero direct contact with human waste such as the offsite sewer networks.

c. **Cape Town Case Study Codebook**

Category	*Description*
Visibility of Sanitation *(theme)*	The salience of sanitation as a social issue among the public and centring it in the space of social activism
Social activism *(code)*	The capacity of black and coloured population and local NGOs to organise advocacy work to improving their living conditions.
Technology acceptance *(code)*	The cultural acceptance of a certain type of technology and whether it resonates positively or negatively with their previous experiences
Race-based segregation *(theme)*	The history of race-based segregation and discrimination in Cape Town during the colonial and apartheid periods and their continuous effect on the lives of the black and coloured population.
Housing crisis *(code)*	Lagging provision of formal housing, by the City of Cape Town, to the residents of low-income settlements due to lack of planning and large number of populations in need.
COVID-19 pandemic *(code)*	The impact of the COVID-19 pandemic on the different aspects of life including employment, income and access to housing.
Devolved governance *(theme)*	Transfer of power from the national government of the state to the local governments
Limited budget *(code)*	Low funds allocated towards sanitation as a low priority area compared to other development areas.
Politicised sanitation *(code)*	Promoting certain type of sanitation projects for political gains, which are often related to household level services (toilets).
Temporary solutions *(code)*	Sanitation technologies that primarily for short-term use (e.g., container-based sanitation on camping sites) and becoming widely used as a quick fix to a serve society in low-income settlements.

d. The Gaza Strip Case Study Codebook

Category	*Description*
Israeli Occupation *(theme)*	The impact of the Israeli Occupation on different aspects of the lives of the Gazans.
Goods movement restriction *(code)*	Limit the entry of goods through borders controlled by the Israeli Occupation due to security claims.

Infrastructure destruction *(code)*	Targeting basic services infrastructure by the forces of the Israeli Occupation in a form that undermines its functionality partially or completely.
The Egyptian government *(code)*	The involvement of the Egyptian government as a guardian for Palestinians in the Gaza Strip.
Service failure *(theme)*	Limited basic services provided in the Gaza Strip resulted from the repeated Israeli armed escalations against the Gaza Strip, their movement restriction on essential construction materials, and other donor-related and user-related issues.
Local capacity *(code)*	The limited capacity of national and local organisations to set the priorities, plan and deliver sanitation services across the Gaza Strip.
Ambiguous roles and responsibilities *(theme)*	Overlapping roles and responsibilities among internal and external stakeholders in the Gaza Strip and its impact on the development and sustainability of the sanitation sector.
WASH cluster *(code)*	The role of the WASH Cluster in coordinating the work of development partners in planning and delivering sanitation services across the Gaza Strip.
Humanitarian relief *(code)*	Relief-oriented external aid such as distributing hygiene kits and vouchers and its increasing role in supporting the service providers in running existing sanitation infrastructure.
Internal division *(code)*	The impact of the internal political division – between the current two governments in Palestine – on receiving external funding to provide sanitation in the Gaza Strip.
Political unrest *(code)*	The impact of repetitive armed escalations by the Israeli Occupation on the infrastructure of basic services in the Gaza Strip.
Foreign policy *(code)*	The role of foreign state and donor agencies in shaping and developing basic sanitation services in the Gaza Strip.
Funding visibility *(code)*	The salience of a set of funding areas for donors in the development sector where it is easier to count their input as outcomes compared to other funding areas that include complex arrangements (less visible outcomes).

Appendix 4.*1*

Terms of Reference

Introduction

In the last century, governments and funding agencies in low and middle- income countries have shown growing interests and concerns regarding environmental protection. Such organisations became more oriented toward construct wastewater and faecal sludge treatment plants. However, these huge projects mostly are not coupled with the needed capacities and arrangements in order for the projects to function properly. Thus, there is a need to document lessons learned from such projects for better future planning of similar projects.

Scope of Work

This work aims to capture lessons from the implementation of 11 faecal sludge treatment plants (FSTPs) by DPHE a few years ago in Bangladesh. To do so, three to four FSTPs will be studied. The proposed locations are: Lakshimpur, Jhenaidah, and Narsingdi. This includes plants that are functioning and plants that are not functioning correctly. To assess the status of the FSTPs, the consultant will assess: the transportation of the faecal sludge (FS) to the plant (both from manual and mechanical emptying), the treatment plant, and the handling of the treated FS from the plant (if applicable). To understand the drivers of success and failure, the consultant will focus on the institutional arrangements, human resources, finances and community engagement. In the case of plants that have been rehabilitated after a period of malfunction, the process will be unpacked, understanding the evolution and the differences between pre- and post-rehabilitations.

Proposed Activities

1. Desk study: review relevant policies, laws and regulations related to FS. Also, review existing reports and documents on the overall initiative or the current sanitation system in place at the municipal level, e.g. SFD reports.

2. Primary data collection: conduct interviews with the relevant stakeholders, including key informants in Dhaka and in the municipalities (including the plants' personnel) to understand the current situation and functionality of the plants and the drivers of success or failure. Regarding the later, the following components of FSTPs management will be covered (proposed questions are included below):

a. Institutional arrangements:
    - What is the level of autonomy of the sanitation utility or municipality in charge to other state institutions?
    - Do political changes have an influence on the management and decision-making process for the FSTP?
    - Which organisations are involved in the management of the FSTP?
    - What is the decision-making protocol for the FSTP management, e.g. internal hierarchy between the involved organisations and communication protocol among the concerned staff? E.g. who reports issues to whom and who is responsible for dealing with these issues?
    - What are the arrangements made to regulate the pit emptiers' work to ensure the delivery of FS quantities to the FSTP for it to function?
b. Human resources management:
    - Are there any institutions in Bangladesh offer training needed for wastewater and faecal sludge treatment projects (planning, design, construction and O&M of sanitation infrastructure)? Does it cover the country's needs?
    - What are the hiring conditions (level of education and training, contract type, financial incentives, and training opportunities) offered to the operators and management team of the FSTP?
c. Financial arrangements:
    - What are the financial requirements to operate the FSTP?
    - What are the energy requirements to operate the FSTP?
    - What are the funding resources to operate the FSTP? Are there enough funds in place?
    - Were there any resource recovery plans of the treatment end-products, e.g. compost, energy?
d. Community mobilisation:
    - What is the level of involvement of the surrounding communities in the FSTP's different phases, were there community outreach plan before constructing the FSTP? For example, were they interested in purchasing compost from the plant? Were they aware of the benefits of constructing these plants? Were they interested in working with the FSTP management (e.g. pit emptiers delivered the collected FS to the plant?).

- Were the pit emptying groups in the FSTP's area made aware of the nature of the FSTP? Did they show interests of collaboration? For instance, deliver the collected FS to the plant?

Deliverables

Detailed assessment report (max 15 pages) of the four FSTPs including recommendations for possible future improvements and monitoring plans.

Suggested outline:

- Introduction [1-2 pages]
    - Background
    - Objectives
    - Methodology
- Case studies [9-12 pages]
    - Plant 1 [3-4 pages]
        - History and status of the plant
        - Drivers of success and failure
    - Plant 2
        - …
    - Plant 3
- Overall discussion (from comparing the 3 case studies, plus Dhaka interviews [2-3 pages]
- Recommendations [1 page]

Management and technical arrangements

The consultant will be responsible for data collection, analysis and reporting, and update WaterAid team in Dhaka and London for any challenges to be addressed. WaterAid team in Dhaka will support the consultant with the logistical arrangements that will include:

- Coordinate the site visits for the FSTPs.
- Link the consultant or provide contact information of the relevant stakeholders.
- Provide translation, if needed, from Bengali to English and vice versa.

In case the WaterAid team is not available, the consultant can hire research assistant for the time period needed.

Appendix 5.1

List of interviews

#	**Job/Organisation**	**Date of interview**
1	WASH Expert #1	07.06.21
2	WASH Expert #2	11.06.21
3	WASH Expert #3	11.06.21
4	WASH Expert #4	29.11.21
5	WASH Expert #5	18.01.22
6	Sanergy staff #1	22.06.21
7	Sanergy Staff #2	23.06.21
8	Sanergy Staff #3	24.06.2
9	Sanergy Staff #4	25.06.21
10	Sanergy Staff #5	30.06.21
11	Sanergy Staff #6	15.10.21
12	Septage Emptiers Association	12.10.21
13	Women in Water and Sanitation Association	28. 08.21
14	Landlord #1	14.10.21
15	Landlord #2	14.10.21
16	Independent pit emptier #1	14.10.21
17	Independent pit emptier #2	20.10.21
18	Nairobi City Water and Sewerage Company	13.08.21
19	Ministry of Water and Sanitation #1	16.08.21
20	Ministry of Water and Sanitation #2	15.08.21

Appendix 5.2

Terms of Reference (Local Consultant)

Exploring the challenges and opportunities of scaling container-based sanitation in Nairobi, Kenya

1. Background

Off grid sanitation is increasingly promoted in low and middle-income countries to address the technical and social challenges associated with the grid system (sewer networks). However, upscaling such systems is not smoothly implemented. In Kenya, the container-based sanitation (CBS) is mostly promoted to serve the population in low-income settlements. Sanergy, a social enterprise based in Nairobi, is leading this by offering their various sanitation services in Mukuru and Mathare. However, challenges to scale the service and recover costs persist and the enterprise still depends heavily on philanthropic funds and hoping to receive Result-based financing from the Nairobi County Government to continue expand their service. This assignment aims to better understand the opportunities and challenges of scaling the service and the potential role of the government to adopt this service.

2. Objective

To support the current research conducted at the University of Leeds related to container-based sanitation (CBS) in Kenya specifically the Scaling up Off-grid Sanitation (SOS) project in collaboration of partner universities - Cranfield University and Meru University of Science and Technology (MUST) and an affiliated PhD research project. The findings of this assignment should contribute to better understanding of the political context of Kenya, the opportunities, and challenges of scaling CBS solutions.

3. Scope of work

First, the consultant will confirm with the research team at University of Leeds and MUST the key research questions to cover and the relevant informants needed to answer these questions. The consultant will then review the tools e.g, interview guides prepared by the PhD candidate at Leeds prior to conducting the research. Then, the consultant is expected to conduct the agreed upon key informant interviews, share the transcripts in English, and prepare a final report summarising the key research findings and ways forward.

The research assignment is supposed to cover the key following topics:

- The nature and extent of urbanisation in Mukuru and Mathare, including land ownership, service provision etc.

- The distribution of power across institutions, organisations and individuals that shape the sanitation landscape
- The dominant ideas and perceptions that shape the policy on sanitation provision
- The current lines of responsibility, accountability, financing of sanitation systems and services (CBS and wider population)
- The gap between policy and practice and the current existing capability of institutions
- The perceptions about the viability of container-based sanitation, and in particular the business model of Sanergy Enterprise
- The perceived ways forward and required roles to scale the container-based sanitation with Sanergy

4. Proposed activities

#	Activity
1	Review the research documents. *This is to be provided by Mariam Zaqout, this includes*: ▪ Summary report of her interviews with Sanergy ▪ Interview guides ▪ Paper draft related to the research ▪ Consent forms, information sheets etc.
2	Draft interviews list, based on the review of the research documents *This is to be agreed with Mariam Zaqout, Joy Nyawira Riungu and Anna Mdee.* The list would include, for example: The City Council, The Nairobi County Government, Civil Society Organizations, Sanitation activists. Ministry of water and Nairobi City Water and Sewage Company
3	Conduct the agreed upon semi-structured interviews *Mariam Zaqout will work closely with the consultant to agree upon the interview guides/key questions for each interview*
4	Prepare and share the interviews transcripts *This is to be shared mainly with Mariam Zaqout*
5	Prepare a final consultancy report *To share with the research team: Mariam Zaqout, Joy Nyawira Riungu and Anna Mdee*

5. Deliverables

All the consultancy documents should be shared in English, the consultant will be reporting mainly to Prof Anna Mdee**.** The timeline of the consultancy will be agreed later with the research team.

Appendix 5.3

Research Brief Presented to Sanergy Management Team

School of Civil Engineering

PhD of Water, Sanitation and Health Engineering

UNIVERSITY OF LEEDS

PhD Title: The Political Economy of Sanitation; driving incentives for more sustainable sanitation services in low and middle-income countries

Researcher: Mariam Zaqout

Email address: cn17mdaz@leeds.ac.uk, Phone: 0044 (0)7548512154

Supervisors: Prof Barbara Evans
Prof Anna Mdee
Dr Dani Barrington

April 2021

Rationale

The misalignment of stakeholders' incentive to fund sanitation services is one of the reasons for the persisting funding gaps across the sanitation value chain (Trémolet, 2011). Despite the increased funds allocated toward sanitation services in low-and middle-income countries, progress is slow towards universal safely-managed sanitation. This is due to the inefficient and biased allocation of financial resources toward the capital costs of large infrastructure such FS/WWTPs, leaving behind aspects of the service chain such as FS collection and transport, which have a higher proportion of operational costs (Mumssen, Saltiel and Kingdom, 2018).

Stakeholder's incentives to provide services are shaped and perpetuated by the prevailing social norms, and political dynamics in a context. Since the perceived costs and benefits of providing these services at an institutional and personal level are relevant to each stakeholder (Ostrom *et al.*, 2002). Batley and Harris argue these factors are 'a product of the service itself' and they suggest it is crucial to first understand the characteristics of the service and explore how they influence the institutional and political dynamics of organisations and, in turn, the incentives of the stakeholders (Batley and Harris, 2014, p.7). This PhD study investigates the incentives of sanitation stakeholders and their causal relationship with the service characteristics of the different types of sanitation services across the service chain.

We choose two cases of private provision (Sanergy in Kenya) and public provision of sanitation services in Cape Town, South Africa. The different provision modes suggest different political, social and institutional settings which have critical influence on stakeholders' incentives and willingness to provide or pay for sanitation services. Therefore, it will offer diverse findings about the relationship between service characteristics and incentives.

Study questions:

- What are the institutional incentives associated with resources allocation process toward services?
- How these incentives interact with the economic and non-economic service characteristics of sanitation?
- What are the available mechanisms and approaches to alter, based on our understanding of the service characteristics, the incentives of sanitation stakeholders to bridge the persisting funding gaps across the sanitation services?

Methodology

I started by conducting a theoretical analysis of the characteristics of the sanitation services provided in the two cases. The analysis used the service characteristics framework of Batley and McLoughlin (2015) as shown the following table. I am aiming to collect primary data to triangulate the findings of the theoretical analysis. This would be through:

- Collect already existing primary raw data such as willingness to pay studies, reports, annual reviews etc.
- Conduct a series of qualitative interviews with relevant stakeholders to better understand the service and its funding arrangements. The interviews will explore the views and experiences of the various actors about the service.
- After analysing the interviews, I will collate the results and invite the interviewees (depends on their availability) to conduct a participatory analysis to brainstorm potential changes to improve the incentives to fund sanitation service.

Service Characteristics Framework adapted from (Batley and McLoughlin, 2015)

Nature of the good: public or private	Market- related	Task- related	Demand-related
Rivalry Excludability= targetability	Monopoly tendency Positive or negative externalities Information asymmetry	Visibility + Measurability of processes and outputs = Attributability Discretion of frontline staff Transaction intensity Variability of treatment Provider autonomy	Frequency of use Predictability of use Territoriality

The research eventually aims to provide useful insights about the dynamics and politics between stakeholders and how to address the conflicting incentives to support government and non-government organisations to better design their funding plants to ensure more sustainable and equitable sanitation services. Therefore, the benefit would directly related to the planning and policy making of the involved organisations and their employees.

Study population/stakeholders:

The research aims to get insights and reflections from various actors including Sanergy staff (described in detail in table (2)) but also:

- Nairobi County Government: employees from different levels in the NCG involved in the provision of sanitation services. This category would include people who liaise/engage with Sanergy and with the informal settlements (the service area of Sanergy).
- Informal settlement residents: this category include people subscribed to Sanergy toilet service and others who seek different providers.
- Fresh life toilet operators and other toilet service providers not contracted by Sanergy.
- WASH and political economy experts in Kenya's context.

Sanergy's contribution/role

Table (2) presents a list of potential interviewees and proposed questions list (some questions can be omitted if deemed irrelevant or if there are other documented resources about it). The interview for each participant will take no more than 30 minutes.

Proposed key informants and the key interview questions to be asked

Areas of expertise	***Key questions***
Marketing	▪ What are the approaches to market the various services in Sanergy (FLTs, collection and transport and treatment products)? ▪ How these approaches were tested and changed since the start of Sanergy operation? ▪ What are the key features of the Sanergy services that increase its visibility to the consumers across the 3 services? ▪ What are the expected changes in your marketing strategy when Sanergy become a contractor for the government? ▪ What is the role of Sanergy partners (e.g, the fresh-life operators, treatment plant) in marketing the service?
Government Relations and Affairs	▪ What are your current strategies to maintain and increase the county's involvement with Sanergy? ▪ What are Sanergy's priority funding needed to receive from the county? ▪ Out of the three sub-services (fresh-life toilets, waste collection and transport and treatment) what do you expect to be the priority funding from the perspective of the county government? why? ▪ Is the government interested to offer services to targeted populations in the informal settlements? ▪ Is this a general trend or it is mainly during elections?

	▪ Are these groups targeted based on political orientation, income level or what? ▪ What Sanergy can do to become an attractive option/provider from the point of view of the county government? ▪ Is more transparency about their service enough to receive the county government support? ▪ Are there any plans from Sanergy to advocate for more control of the cartels by the county government in the service area?
Operations	▪ How do approach/recruit new fresh-life operators? Eligibility criteria? ▪ What is the eligibility criteria to contract them? ▪ How do you maintain the relationship with them? ▪ What are your approaches to monitor and regulate their work? ▪ What are the customer support services offered to operators after sale? ▪ What are the strategies to increase the loyalty and customer retention of operators? ▪ Are the toilet users (households) included in the customer support unit? How do you reach/communicate with them? ▪ What are the key positive feedback received from the user about the operators? ▪ What are the support services offered to them? How do they access information? ▪ How do you recruit waste emptiers? Eligibility criteria? ▪ What is the support or training available for them? ▪ How do you maintain high quality and accountability in the treatment plant operations?
Strategy	▪ Can you please describe how the business model of Sanergy has evolved since the beginning? ▪ What is the logic behind flexible toilet fee collection? Was it Sanergy's idea or the fresh- life operators? ▪ Are there any plans to mobilise further funds from the Fresh-life operators or the households/users to contribute to the waste collection and treatment? How? ▪ Is there a plan to mobilise other stakeholders to pay or invest e.g, banks, NGOs, the ward-level government representation? How? ▪ What are you expecting to be changing in Sanergy's business model in the case of receiving the Results-based financing from the county government?

Communications and external relations	▪ What are the current advocacy areas that Sanergy work on? ▪ What are the key features of the service that you use to promote it? ▪ Are there potential partners/investors that can contribute financially to Sanergy beyond the current based on your advocacy work? What are their key interests/motives? ▪ Would promoting the positive externalities of the service (improved public health and cleaner environment) be enough incentive to attract more donors/funders? ▪ Do you think the use of the unique brand for your service would be an attractive feature for the government or other investors? Why? ▪ Did you consider changing the brand to present it as a government service, once Sanergy receive the result-based financing? How?

I am aiming to analyse the data collected (from any relevant reports or the interviews) and integrate it with the theoretical analysis. As mentioned earlier, if it is applicable for Sanergy team, I will facilitate 1 or 2 participatory analysis sessions to further analyse the findings and propose potential solutions to mobilise stakeholders' incentives.

Timeline

Task	**Proposed deadline**
Conduct the key informant interviews	by the end of June 2021
Collect any relevant reports	by the end of June 2021
Analyse the data from the interviews and report	by the end of August 2021
Submit journal paper for publication	By the end of January 2022

As this research uses Sanergy as a case study, we are keen to share any useful research findings, collaborate beyond the interviews and welcoming any interests to contribute to future publications (as co-authors) or any other forms of engagement. I am also happy to join in with any future collaboration if deemed helpful to Sanergy.

Appendix 6.1

List of interviews

Source	Name	Date
WASH Failure Project - Open Access Dataset	WASH Researcher #1	10.09.20
WASH Failure Project - Open Access Dataset	WASH Researcher #2	14.09.20
Remote interview	PE Researcher #1	02.11.21
Remote interview	PE Researcher #2	29.09.22
SOS In-person meeting	CoCT	16.09.22
In-person interview	Cemex Trading Enterprise,	19.09.22
In-person interview	Ndifuna Ukwazi	20.09.22
In-person interview	Development Action Group (DAG)	22.09.22
In-person interview	Asivikelane activist	20.09.22
In-person interview	SJC Activist	22.09.22
In-person interview	Seskhona	22.09.22
Remote interview	SaniTech	28.09.22

Appendix 6.*2*

Interview Guide for each Interviewee Group

Service providers

1. Can you talk a little bit about history of your company? do you have previous contracts with City? Do you have other business/other cities

2. What are your key services? Do you service all the toilets? What about chemical toilets, flush toilets?

3. What is the profit margin? Do you receive subsidy?

4. What is the City's criteria for selecting contractor? What do you think has made you stand in the bidding process? What are the difference/changes in the contract from the last one?

5. Are there any relations with the national, provincial government?

6. Health insurance and vaccine? Is it part of your mandate or the City's?

7. How do you choose the leader to work with the 25 janitors?

Social activists (Individuals and NGOs)

1. Can you explain the work of your organisation?

2. From your experience, are ward councillors supportive to their communities? Do they take the initiative in collaborating with your organisation?

3. What are the key support tools you provide communities? Do you go to promote your support services and reach out or do people initiate this?

4. What is the role of ward councillors (elected official who also chair ward committee) in influencing the allocation of services to low-income settlements? How powerful is the collective action aspect?

5. Is the sense of solidarity and collective struggle a key driver?

6. Do you mobilise action to address the flooding issue?

Appendix 7.1

Interview Guide for each Interviewee Group

For WASH experts

Thanks a lot for agreeing to have this interview with me today.

1. Can you please talk about your expertise as a consultant? What is your involvement with international aid agencies?
2. Do you think the technologies adopted in water and wastewater plants compatible with the Gaza Strip reality, in terms of operational capacity (energy, spare parts availability etc)? Are the technology choices influenced by the donor agency and/or foreign consulting? (Ask about the difference between technology in NGEST and the WW treatment plants in Khan Younis and the Middle Area
3. There are around 25% of the Gaza Strip population use onsite sanitation (septic tanks). What are the forms of services provided to this population by external donors?
4. What are the current plans to extend sewer network to those populations?
5. What is your opinion about the current sewer networks in the Gaza Strip in terms of capacity and functionality?
6. Do you think network rehabilitation projects are a priority for the Palestinian Water Authority and donor agencies?
7. The storm water flooding during winter is recurrent issue, what do you think are the key barriers to rehabilitating drainage networks?
8. What is your opinion about the World Bank Assistance in Palestine and Gaza specifically in terms of the types of projects it funds? Do you have remarks about other donor agencies?
9. What is the level of inclusion for the governmental authority offices in Gaza Strip in the planning, coordination of water and sanitation programme (E.g., Water Authority)? How has this changed over the years?

Are there any issues that I did not cover and you think are relevant to the study?

Thanks a lot for your participation and let me know if you would like to be informed about the progress of this study in the future.

For utilities

Thanks a lot for agreeing to have this interview with me today.

1. Can you please talk about your expertise at Gaza City Municipality?
2. Can you talk about the current services provided by the Gaza City Municipality? (Try to expand on this as much as possible to understand the scope, who fund it, the level of functionality of each service e.g, Is there a WW treatment plant? How they run it?
3. There are around 25% of the Gaza Strip population use onsite sanitation (septic tanks). Are there people in Gaza City still not connected to the sewer network? What are the forms of services provided to this population by Gaza Municipality? Are there any plans to connect them?

4. The storm water flooding during winter is recurrent issue, what does the Gaza Municipality provides to minimise its impact? Who is the funding partner for such service?
5. Who are the current funding agencies working with Gaza Municipality? What are the types of projects they fund? (probe more questions, based on their answers, so they can expand more)
6. What is the role of your funding partners in deciding the type of project and the priorities/services of the municipality?
7. What is your opinion about the types of projects that external funders choose to fund, in terms of sustainability and relevance to the needs of the population?
8. Does the municipality work with the WASH cluster? What is the nature of the relationship between the two bodies?
9. Is there a collaboration between the Municipality and PWA or CMWU? Can you elaborate more?

Thanks a lot for your participation and let me know if you would like to be informed about the progress of this study in the future.

For NGOs

Thanks a lot for agreeing to have this interview with me today.

1. Can you please talk about your expertise in (Name of the organisation) ?
2. What are the types of sanitation projects that (Name of the organisation) runs?
3. What are the governorates that you work on? Try to know more if they work in Khan Younis, Rafah and the middle area?
4. Who are the beneficiaries of your projects? What are the selection criteria?
5. Are the beneficiaries involved in deciding the project types, if yes, how?
6. How do you decide on the types of projects and their locations? E.g, WASH cluster?
7. There are still communities who still use onsite sanitation (not connected to the sewer network), Does (Name of the organisation) have projects that target those populations? Try to get a detailed answer for this one
8. Do you coordinate with the Palestinian Water Authority or other government offices in Gaza in implementing those projects?
9. Do you work with local NGOs? Can you expand about your partnership with them (E.g, what is the support your provide, how do your monitor and ensure the completion of these projects)?
10. How the blockade has influenced the types of projects that your organisation implement?
11. Who are the main donors for your WASH projects? What is the role of your donors in setting the programmes and agenda of (Name of the organisation)?

Do you think there are topics that are relevant to the study that I did not cover?

Thanks a lot for your time

Appendix 7.2

List of interviews

#	**Job/Organisation**	**Date of interview**
1	WASH Expert #1	05.06.22
2	WASH Expert #2	14.06.22
4	WASH Expert #3	03.07.22
5	The WASH Cluster	13.06.22
7	Gaza Municipality	21.06.22
8	INGO #1	22.06.22
9	INGO #2	25.06.22
10	CMWU	05.07.22
11	INGO #3	25.07.22
12	Human Rights Worker	23.08.22