



Enabling Business Innovation in Nepal's Sanitation System

Market Analysis

EXECUTIVE SUMMARY

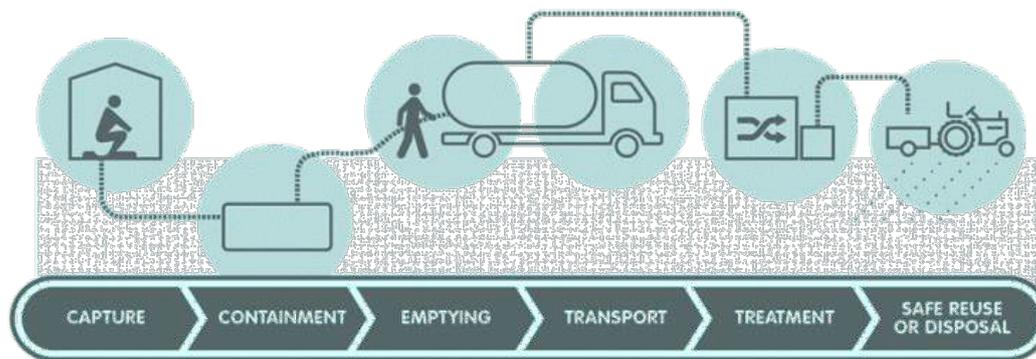
Fecal sludge management refers to the emptying, transportation and treatment of fecal sludge from onsite containment systems for safe disposal or reuse. Nepal has made considerable progress in improving water access and sanitation in the last decade. However, there is still an urgent need to manage the fecal sludge stored in containment systems connected to latrines. The unsafe release of such sludge has tremendous adverse effects on the health of the population and the environment in general.

Given the absence of centrally connected sanitary sewer systems, most households in urban areas of Nepal rely on on-site sanitation facilities. At present, a variety of informal and formal businesses exist in the form of manual or mechanical emptying service providers. However, such businesses operate unsustainably, are not able to provide services to low-income communities and are not regulated or monitored. Moreover, most cities in Nepal lack proper disposal sites, efficient desludging technologies and sludge treatment centres. In such a scenario the development of FSM service chains and systems, that can safely empty and transport fecal sludge to treatment centres at affordable rates is essential. Municipalities, civil society organisations and the private sectors have to work together to develop innovative technologies and business model that can overcome these challenges, and realise the full potential of the critical role they can play in FSM systems.

This piece begins by highlighting the key challenges faced by different stakeholder segments in the FSM space in Nepal, followed by a deep dive into market drivers, and a summary suggesting recommendations and next steps. The key challenges and recommendations have been formulated based on a study conducted by Ennovent and Oxfam in 2018 on the market and business opportunities created for the private sector in the FSM service chain across five municipalities of Nepal.

SITUATION APPRAISAL

Nepal has made considerable progress in improving water access and sanitation in the last decade. While the focus has primarily been on improving sanitation facilities and moving towards the open defecation free status, there is also an urgent need to manage the fecal sludge stored in containment systems connected to latrines. Nepal has declared more than 97% of its area as Open Defecation Free ('ODF') and aims to declare entire nation as ODF by 2019. Unsafe release of fecal sludge has tremendous adverse effects on the health of the population, and causes excessive pollution of water bodies, groundwater, and the environment in general. Until a safer plan to dispose and treat fecal waste from containment is not developed, sanitation initiatives for better health and hygiene would be incomplete.



Graphic: FSM service chain (Source: IRC)

Fecal sludge management (‘FSM’) is the emptying, transportation, and treatment of fecal sludge from onsite containment systems including septic tanks, holding tanks, and pits for safe disposal or reuse. Given the absence of centrally connected sanitary sewer systems, most households in urban areas of Nepal rely on on-site sanitation facilities, which require emptying and disposal services when full. At present, a variety of informal and formal businesses exist in the form of manual or mechanical emptying service providers. However, most of these businesses operate unsustainably, are not able to provide services to low-income communities, and are not regulated or monitored. Moreover, most cities in Nepal lack proper disposal sites and sludge treatment centres. Where such facilities do exist, they are poorly designed and managed, or safe disposal is not practiced resulting in widespread practice of unsafe emptying and disposal of fecal sludge.

Challenges related to FSM are even more pressing in urban areas. The rapid urbanisation of Nepali cities has not been matched by the simultaneous development of adequate infrastructure and systems that need to be in place for the sustainability of these cities. As cities in Nepal aspire to develop networked sanitation systems for their residents in the long-term, an effective FSM service chain, that can be sustained through private sector participation, will be crucial for enhancing and maintaining public and environmental health.

This document is based on a feasibility study carried out in five cities – Birendranagar, Ghorahi, Gulariya, Kapilvastu and Nepalgunj. The cities were chosen based on their population size, infrastructure and resource capacity among cities of the same district. The study employed a mix of desk research including policy and regulatory reviews, and primary research comprising household (‘HH’) and customer interviews, as well as Key Informant Interviews (‘KII’) with business owners and relevant stakeholders such as municipal offices, local chambers of commerce and industries (‘CCIs’), financial institutions, etc. In total 506 HHs/individuals and more than 25 key informants were interviewed for HH interviews and KIIs across the five cities.

STAKEHOLDER CHALLENGES

Stakeholders operating across the FSM service chain in Nepal face several critical challenges, some of which present significant barriers for private sector participation. These challenges can be categorised as follows:

Market

There is a general lack of awareness among customer bases concerning the availability of safe FSM services such as mechanical emptying, reflected in the charts below, which consequently drives the reliance on unsafe emptying and disposal practices. For instance, less than 30% of households had emptied their septic tanks in four out of the five cities surveyed cities in the span of five years. Moreover, over 80% of houses in Gulariya opted for manual cleaning. There is also a lack of incentive for consumers to shift to proper FSM service providers and systems as the businesses that do exist and operate are mostly inefficient and formal markets are absent in most cities. At the local level, the municipalities studied in Nepal do not have policies and regulations in place to create a conducive environment for the private sector to flourish, especially in FSM.

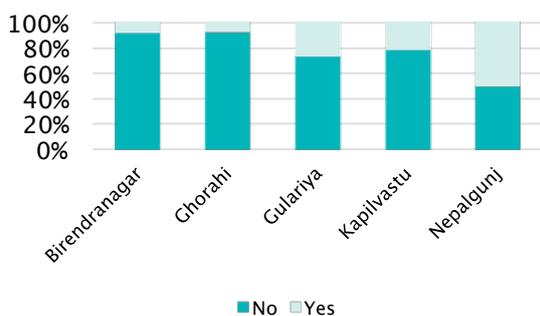


Chart: Percentage of HHs with emptied tanks

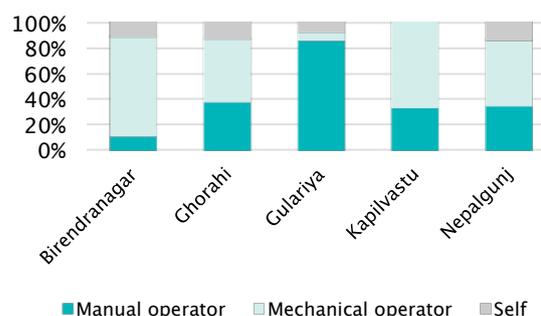


Chart: Emptying method

Technology

The technologies currently deployed in the FSM service chain, particularly for collection and disposal, are inefficient and of poor quality. Emptying systems are not able to adequately empty septic tanks in a hygienic way. Most of the desludging pumps only pump out slurry, but do leave some volume of sludge in the containment. In low-income areas the trucks are often unable to reach households because of narrow lanes or the absence of roads altogether. Entrepreneurs and municipalities lack access to appropriate technologies and innovations to operate technical systems, which leads to their inefficient use.



Picture: Limited existing systems for emptying of sludge by private operators (Source: Shutterstock)

Business Knowledge

The businesses that operate in the FSM space are largely informal. Most of the entrepreneurs have inadequate knowledge about the market, FSM infrastructure and the supporting ecosystem. Business acumen, especially on customer acquisition and business model innovations, was found to be lacking. There is a need for entrepreneurs to be supported in the development of appropriate marketing strategies and affordable pricing. Consequently investment and interest from the private sector in FSM has been very low.

Governance

The municipalities, which are the apex body for FSM systems, have limited capacity and resources for monitoring and regulating such systems, as well as in working with the private sector. There is also a lack of funding for FSM infrastructure and more often than not it is not prioritised with the municipalities' plans. The regulations and policy on how an FSM-related business could potentially work across multiple municipalities were also observed to be unclear. At the same time, there is a need for strong governance from the local government to ensure quality service and affordable pricing.

MARKET DRIVERS

Despite these key challenges, the development of FSM service chains and systems that can safely empty fecal sludge and transport it to treatment centres for safe disposal or reuse is essential for all growing municipalities. The municipality, civil society organisations, and private sectors have to work together to develop innovations that can overcome these challenges and realise the full potential of the critical role they can play in the FSM systems. For the private sector, the FSM market is anticipated to stabilise and grow in Nepal's urban areas based on the following market drivers.

Business Environment

The Constitution of Nepal recognises access to water and sanitation facilities as a fundamental right. The Constitution states that every individual has the right to live in a clean and healthy environment, ensuring safe water and sanitation access. It also states that those affected by environmental degradation or pollution have the right to get compensated by the pollutant as per the laws. Various acts and policies such as the Water Resources Act (1992), Environmental Protection Act (1997), Urban Water Supply and Sanitation Policy (2009), and Total Sanitation Guidelines (2016) focus on wastewater and fecal sludge management, sanitation, water, etc. help to provide safer, better quality, adequate, and improved sanitation services at affordable prices to improve livelihoods.

The Government of Nepal has recently developed an institutional and regulatory framework for FSM, which highlights the roles of various stakeholders across the FSM service chain. It includes regulations, guidelines, and standards for the development and management of the FSM service chain from containment to disposal and/or reuse. The framework has also identified a greater role for the private sector throughout the FSM service chain in storage, emptying and transportation, disposing, treatment, and the reuse of fecal sludge. This document, along with the Local Self-Governance Act and the Constitution, puts municipalities, by virtue of being local bodies, as the apex organisations dealing with planning, implementation, and monitoring of FSM activities in their respective jurisdictions.



Picture: Access to clean water remains a daily struggle for many. (Source: Shutterstock)

Demand

Most municipalities have no foreseeable plans or resources to develop a connected sanitary sewer system indicating the urgent need for privatised FSM systems. Households with toilets rely on on-site sanitation systems, which need emptying once full, to contain human waste. Significant market potential for the FSM service chain exists in areas with a population of more than 50,000 households when considering septic tank sizes and fecal sludge accumulation rates, as reflected in the table below. Our calculations reflected an annual market potential of approximately 4.1 to 11.5 million NPR across the five cities.

	Birendranagar	Ghorahi	Gulariya	Kapilvastu	Nepalgunj
Fecal Accumulated Annually (m3)	3,448	5,412	2,242	2481	4630
Total Fecal Waste Accumulated (m3)	11,492	18,038	7,472	8,269	15,431
Tank Capacity (m3)	5	5	5	5	5
Trips Made with 5000l Truck	2,298	3,607	1,494	1,653	3,086
Yearly Market Potential (NPR)	11,492,184	9,019,098	6,127,521	4,134,587	7,715,895

Table: Market potential based on FS accumulation

This market size is already considerable in some cities where some form of mechanical and manual emptying exists as deduced based on the information available on septic tank emptying frequency. In this scenario the annual market potential varied from NPR 1.8 to 11 million.

Furthermore, cities in Nepal are also rapidly urbanising and there is constant migration of people from rural to urban areas. The general awareness and attitude of people towards sanitation is also changing, with more people constructing and using toilets. Ability to pay for FSM services is high across all cities and the majority of households are involved in trade, agriculture, service, business etc. The progress made by Nepal in sanitation is reflected in the steady change in the attitude and awareness of people towards sanitation, hygiene, and cleanliness. Lack of awareness concerning the adverse effects of improper FSM management has also meant that the ability to pay has not translated to willingness to pay in some areas.

	Birendranagar	Ghorahi	Gulariya	Kapilvastu	Nepalgunj
Percentage of HHs that have emptied	9%	8%	27%	22%	50%
Total HHs that have emptied	2,072	2,805	3,492	2,618	13,946
Frequency					
Less than once a year	0%	13%	4%	5%	2%
Once a year	13%	13%	0%	0%	6%
Every 1–2 years	13%	0%	8%	10%	12%
Every 2–3 years	0%	0%	8%	0%	14%
Every 3–4 years	0%	0%	20%	5%	10%
Every 4–5 years	38%	50%	36%	25%	22%
5 years or more	38%	25%	24%	55%	35%
Tanks emptied in year	648	1,426	1,050	748	4,424
Total Revenue (NPR)	3,240,000	3,565,000	3,675,000	1,870,000	11,060,000

Table: Market size based on HH emptying frequency

Industry competitiveness and profitability

The FSM market is fairly non-competitive because of limited private sector participation through contractual partnerships with local bodies. The local bodies are limited by capacity and usually only engage with a sole service provider in emptying and transportation or, in very rare cases, treatment of fecal sludge. As such, the market share and profitability of businesses operating in the FSM market is very high. For emptying and transportation services, drivers of profitability include fuel, personnel costs, vehicle costs, number of customers and meeting demand requirements. Having the appropriate working technology and setting a competitive tariff allows businesses to meet demand requirements. However, more often than not, these businesses and services are also not capitalising on the value that can be delivered to customers as compared to manual operators, nor are they innovating on their models to reach low-income customer segments.

SUMMARY ANALYSIS

Opportunities in the FSM chain in Nepal exist for businesses that address gaps across the FSM service chain, from containment to safe treatment and fecal sludge reuse. While businesses exist, most of them are informal and are drawn towards emptying and transportation of fecal sludge; practice of safe disposal and treatment is almost non-existent. As such, the unsafe disposal of fecal sludge in water bodies, agricultural lands, forests etc. is rampant.

Therefore, there are no market risks from the demand side. There are also no regulatory risks as private sector participation is encouraged, and the likelihood of centralised sewer systems is unlikely. With growing urbanisation and dependency on FSM systems to empty onsite sanitation systems, the FSM market is expected to be stable and growing in urban areas of Nepal. However, entrepreneurs are unaware of the scope and profitability of businesses in the FSM space. The stimulation of private sector engagement requires awareness and promotion of the business opportunities, and conducive business environment and policy framework to enable private sector investment.

There is also a need to change consumer perception and attitudes, as well as to build the capacity of local municipalities for sustaining the system, efficient delivery and systematic monitoring of safe FSM services. In some cases, entrepreneurs lack appropriate knowledge on FSM and perceive it as risky business. Entrepreneurs who are already in the business, however, need to innovate across technology, revenue models, pricing strategies, financing, implementation and partnership mechanisms to sustain profitability, and to cater to the mass market under the prevailing socioeconomic and geographical situation of the area in which the business operates.

To learn more contact office@ennovent.com or aadhikari@oxfam.org.uk

This market analysis was written by Tapas Neupane, Abhishri Agarwal and Karan Chandran from Ennovent, and Anjil Adhikari from Oxfam. It is based on research jointly conducted by Ennovent and Oxfam. We extended our gratitude to the local municipalities of Birendranagar, Ghorahi, Gulariya, Kapilvastu, and Nepalgunj for their crucial contributions to this research.



ABOUT ENNOVENT

Ennovent is a venture catalyst that takes innovative business ideas to unexplored low-income markets in developing countries. We offer the private, public and third sectors a venture platform with startup expertise, local capacity and a global community. Through fair partnerships we share the risks and rewards of optimising sustainable impact and profits in low-income markets. Since 2008, we have catalysed over 185 ventures in 30 countries through 60 projects on our platform.



ABOUT OXFAM

Oxfam is an international confederation of 19 organisations networked together in more than 90 countries, as part of a global movement for change, to build a future free from the injustice of poverty. Oxfam in Nepal works closely with development stakeholders in the field of Water Supply, Sanitation and Hygiene (WASH), Disaster Risk Reduction and Climate Change Adaptation (DRR/CCA), Gender and Social Inclusion and Food and Economic Justice.