

WORKING IN TANDEM: THE INFORMAL SEPTIC TANK EMPTYING MARKET IN AYA NAGAR, DELHI

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This report is the first part of a two-series case study on the informal faecal waste desludging sector in non-sewered settlements in Delhi.

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ABSTRACT

The aim of this research report is to explore the types of sanitation services that exist in non-networked settlements. Based on a case study of Aya Nagar in South Delhi, the research shows how households are primarily dependent on septic tanks, and rely on an informal market comprising of small-scale local entrepreneurs for the emptying of faecal sludge. We find that this sector's functions are structured by the entrepreneurs themselves, who check competition, manage tariffs and mitigate operational risks through collective action. This arrangement relies on the existing networks of kinship and friendship between operators. Financially, the sector offers entrepreneurs a low but steady source of income given a recurrent demand for desludging service in the settlement. Nevertheless, the occupation remains a socially stigmatized activity as it deals with human excreta, which in India, is traditionally associated with low-caste communities.

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GLOSSARY

<i>Balmiki</i>	a caste traditionally associated with sanitation work
<i>Brahmin</i>	the superior-most caste traditionally associated with temple priests
<i>Gujjar</i>	a pastoral agricultural caste specific to North India
<i>haveli</i>	an Indian house or mansion of traditional make
<i>Jat</i>	a North Indian community traditionally associated with farming
<i>Jatav</i>	a caste considered part of the Chamar caste traditionally associated with leather work
<i>mohalla</i>	neighbourhood
<i>Nai</i>	a caste traditionally associated with barbers
<i>Vaishnav</i>	a community that engaged in agriculture and temple worship

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INTRODUCTION

As per the Census from 2001-11 urban India grew by 91 million people. Even as this figure is estimated to continue rising, the state has remained grossly inadequate in addressing the sanitation needs. Around 48% of the global urban population without access to toilets is concentrated in India (Dasgupta & Jain, 2014). Moreover, 68% of the urban households in the country still lie outside of the public sewerage network (Census 2011). A large share of these households continue to be dependent on private septic tanks and pit latrines, which comprise 47% of the existing infrastructure (Census 2011). But despite the predominance of private infrastructure in urban sanitation, very few states and urban local bodies have official mandates regarding the provisioning of services to manage and treat faecal sludge. This policy void has been acknowledged by the Ministry of Urban Development, which introduced the National Policy on Faecal Sludge and Septage Management in 2017. Its aim is to encourage national, state and local bodies towards safe collection, treatment, and disposal of faecal waste collected from septic tanks. In practice, however, the collection and transportation of faecal sludge is often carried out informally.

Informal small-scale service providers play an important role in the developing world where coverage by public utilities is insufficient. These businesses are often initiated by private entities and characterized by informal investment, and limited technical and managerial knowledge (Kariuki & Schwartz, 2005). While literature on the informal small-scale septic tank emptying sector is abundant in the context of African nations (Shaub-Jones 2010; Mbéguéré et al 2010), very little is known about the sector, as it exists in India. This knowledge gap has also been highlighted in the National Policy on Faecal Sludge and Septage Management, which mentions the lack of information pertaining to collection, conveyance and treatment of faecal sludge (MoUD, 2017, p.32). Bearing this in mind, this document seeks to create better understanding of how this sector functions. Such a study is all the more necessary post the Swachh Bharat Abhiyan—the much publicized sanitation scheme that was launched in 2014—which catapulted sanitation to a matter of national concern.

This report investigates the organization of the informal small-scale septic tank emptying sector through a site-specific case study in context of the megacity of Delhi. Approximately 28% of households in Delhi continue to be dependent on septic tanks (Census 2011) and most of these are concentrated in the peripheries. In these settlements that are covered neither by sewerage systems nor by public services for septic tanks desludging, informal providers are the main actors involved in faecal waste management. The research therefore focuses on the study of these service providers, looking at their socio-economic background and their professional trajectories as well as the financial and organizational set-up of their activities. It also discusses the relationship between caste and sanitation, and the persistence of stigma attached to activities related to sanitation work.

Section I of this report presents the methodology and the rationale for site selection. This is followed by Section II, which introduces the settlement of Aya Nagar and its requirement for faecal waste management services. Section III describes the emergence of informal providers. In Section IV we focus on the socio-economic background and the professional trajectories of the operators. Sections V and VI describe the functioning and financial activity of septic tank cleaning activity respectively. This is followed by Section VII that presents the debate around formalizing the sector. Finally, Section VIII explores the intricate ways in which this sector remains rooted in caste dynamics and sanitation work.

1. METHODOLOGY

The report is based on an in-depth qualitative research conducted between January and March 2017 in the peripheral settlement of Aya Nagar in South Delhi, where 94% of households rely on septic tanks according to the 2011 Census.

The study has tried to understand the industry from the points of view of individuals who own small-scale septic tank emptying service business in Aya Nagar. These individuals are the key decision makers regarding the organization of the business, its operation and provisioning of desludging service. Most business owners manage only the operation of the service, and devolve physical chores pertaining to desludging to employees; although there are some who own the trucks, manage operations as well as carry out physical tasks.

In 2017, Aya Nagar was serviced by 12 providers, of which 10 agreed to be interviewed. Additionally, one former service provider responded to an unstructured interview. Initial contact was established with one service provider who subsequently acted as an entry point towards other individuals working in the sector. All 10 of the primary participants were interviewed using a structured questionnaire. The interviews touched upon a wide range of matters, including the service provider's social profile, professional journey, source of investment, negotiations of operation, labour, competition and personal experiences of engaging in the sector. Since private operators work together, individual interviews were at times interspersed with collective

narratives and transformed into focus group surveys leading to difficulties for assessing precise numbers on finance. Further, this made it particularly challenging to raise issues pertaining to caste and perceptions around work, given the loss of privacy. These difficulties were partly overcome by making repeated visits to the settlement that over a period of time enhanced the levels of trust. All responses were recorded in handwritten field entries, and the usage of audio recordings was avoided in order to facilitate a comfortable environment to encourage authenticity.

These field visits were also comprised of numerous informal and semi-structured interviews with residents of the settlement. This was done in order to gain a broad overview of their opinion on the service, as it functioned, as well as the individuals who were engaged in its provision. Additionally, we also interacted with caste-based community leaders, ward level leaders and local politicians in the settlement. It must duly be stated that gathering of these narratives was made rather difficult due to the discomfort involved in sharing sensitive views on caste. Residents visibly refrained from expressing personal opinions on topics that were suggestive of caste and discrimination. However, in the few instances where such views were explicitly stated, these were fittingly recorded in handwritten field entries post the interview. Lastly, for the purposes of anonymity, all the names used in this report are alias.

2. THE URBANIZATION OF AYA NAGAR AND EMERGENCE OF THE NEED FOR FAECAL WASTE MANAGEMENT SERVICE

This section describes the morphological changes experienced by Aya Nagar between 1991 and 2011. The village underwent rapid urbanization that eventually resulted in the spontaneous development of a residential settlement. This process can be attributed to three primary causes (i) an affordable real estate market (ii) connectivity to the transit system and (iii) close proximity to Gurgaon. The onset of urbanization caused rapid population growth in the area, bringing about a change in the social composition of the settlement, which created a distinct separation between original residents and newly settled migrants. This sudden shift in its morphology was followed by decline in the traditional economy of the settlement.

Aya Nagar is marked by fragmented provisioning of basic public services, which is particularly acute in the context of water and sanitation. Public provision of these services is characterized by erratic coverage and weak institutional capacity. The settlement is devoid of public sewerage networks, making private septic tanks the most common sanitation infrastructure in the area. However, no state-led interventions exist for faecal sludge management, which has led to the creation of an informal market of septic tank emptying services in Aya Nagar.

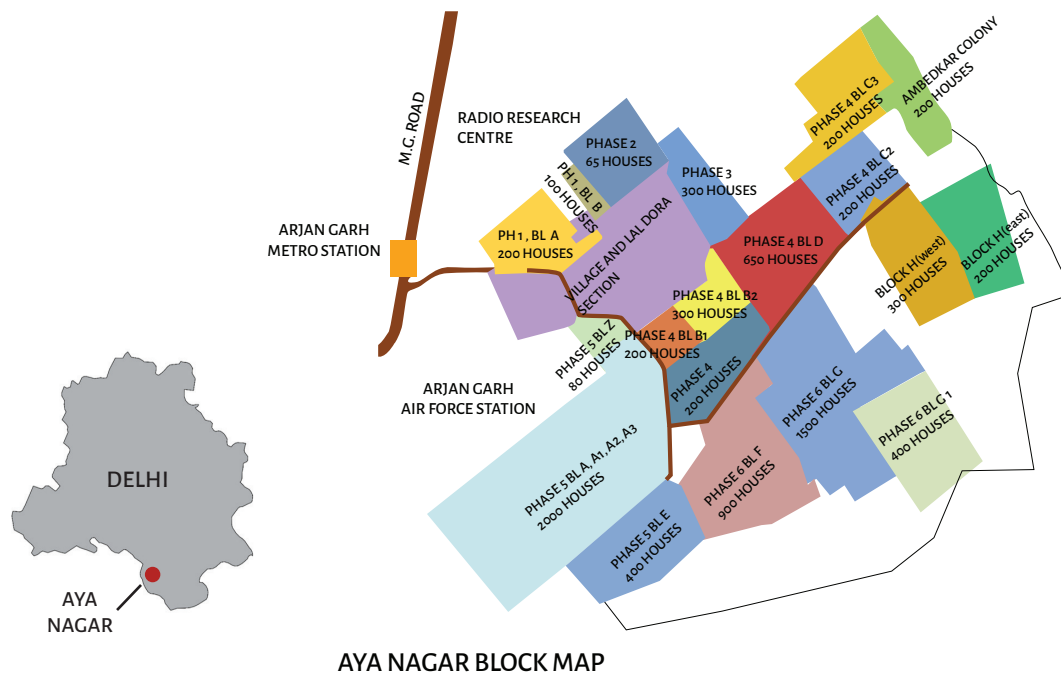
2.1 Transitioning from Rural to Urban

Aya Nagar is the last urban agglomeration along Delhi's South-Western border. It is surrounded by the Arjan Garh Air Force Station in the South-West, ravines in the South-East, and the farmhouses of Jonapur in the East.

The settlement is constituent of two parts: an urban village called the Aya Nagar Village and an informal residential settlement known as Aya Nagar Colony. It accommodates 6,751 households and has a population of 33,000 (Census 2011). The density of its population stands at 4,039 per square kilometer, much below the state average of 11,297 per square kilometer.

Starting mid-1980s, the village of Aya Nagar underwent dramatic spatial transformation from rural to urban. The villagers sold off agricultural land and common village land to private aggregators who carved plots of size 30–200 square yards for sale to an incoming migrant population. The shrinking of open land resulted in the decline of dairy production that was being replaced by an emergent real estate market. A conversation with a prominent Gujjar landowner revealed that land during the early period of the settlement's urbanization was available at a throwaway price of Rs. 30 per square yards, which made it ideal for the growing population that was seeking affordable housing. As it stands today, it is characterized by multi-storied apartments and tenement structures that are fused between traditional *havelis*. Additionally, the area also benefitted from its proximity to the Mehrauli-Gurgaon Road (M.G. Road), which tethered it to the commercial hubs in South-Delhi and the upcoming service sector in Gurgaon, Haryana. Aya Nagar Village was also connected to the bus-transit network much before other villages in its vicinity. These locational advantages were further enhanced with the addition of the Arjan Garh Metro Station along the M.G. Road, in the year 2010.

Figure 1. Map of Aya Nagar



Adapted from: Delhi Urban Arts Commission (2014). *Aya Nagar Block Map*. Scale not given. In: *Aya Nagar Urban Development: Planned Development of Unauthorized Colonies, City Level Projects*, Delhi Urban Arts Commission, New Delhi, India.

Thus, from 1991–2011, the settlement experienced a tenfold increase in the number of households, resulting in the development of Aya Nagar Colony. The newly emerged settlement is categorized as an Unauthorized Colony (UAC), standing in violation to the legal standard, for it is built on rural land, which, as per development norms, cannot be sold for non-agricultural purposes (Bhan, 2013).

Aya Nagar Colony is divided into six 'phases' in accordance to a chronological order of emergence (Figure 1). Phase 1 is the oldest residential block while Phase 6 is the most recent block to have come up in the settlement. Each phase is further subdivided into numerous blocks. Residential blocks comprise of single and double-storied independent housing structures that are built along linearly cut lanes. These are occasionally interspersed with multi-storied apartments and small stores accommodating groceries, beauty parlours, playschools, and tailoring shops among others.

The original inhabitants of Aya Nagar are the Gujjars, who date the birth of the village to the late 19th century. Categorized as Other Backward Classes (OBC), the Gujjars of Aya Nagar Village were formerly a community of pastoral agriculturists, who engaged in the production and distribution of milk. Dairy production was the primary economic activity of the village, which was supplemented by seasonal farming on private agricultural landholdings that were also exclusively owned by members of the Gujjar community. Following a pattern common to rural India, the village of Aya Nagar is spatially divided into segregated caste-based *mohallas*. The Gujjars, being the largest community in the village, occupy four mohallas, namely: Baba Mohalla, Gangdas Mohalla, Bhuvalia Mohalla and Ghoda Mohalla.

The village is also home to communities of Brahmins, Jatavs, Balkmiks, who occupy the Pandit Mohalla, Harijan Mohalla and Balmiki Mohalla respectively. The latter two caste groups form a significant fraction of the village's population and are categorized as Scheduled Castes (SC). Also known as Dalits, these communities were formerly treated as 'untouchables' due to their traditional engagement with occupations regarded as impure and inferior. These castes did not own agricultural land and were chiefly dependent on physical labour for livelihood.

The Jatavs of Aya Nagar Village, prior to its urbanization, dabbled in diverse activities such as carpentry, quarrying, masonry, leatherwork, and skinning of dead cattle. Some also worked as field hands for the Gujjars. The Balmikis, on the other hand, primarily subsisted on sweeping the village streets and cleaning homes. Even though some of them did engage in handling human excreta, the service was confined to only a few dry latrines that had been designated for use by the sick and elderly. The settlement had a high rate of open defecation

that cut across caste and gender, and was made convenient by the ample availability of forest cover and fields in the nearby surroundings.

Aya Nagar Colony is comprised of young, working professionals as well as working poor and people belonging to the middle class. Christianity is the second-most dominant religion, at 6%, after Hinduism, which constitutes 89% of the population (Census 2011). One cannot help but notice numerous churches interspersed between residential units; an outcome shaped by the influx of Christian migrants from Jharkhand and Kerala working in the government sector. Migrants in Aya Nagar also hail from various other parts of the country, such as Odisha, Punjab, West Bengal, Uttarakhand and Uttar Pradesh. In addition, the colony also houses a substantial number of residents originally hailing from Aya Nagar Village, who located there due to generational increase in family size.

The residents of Aya Nagar Colony do not hold title to the ownership of property. Property is transferred formally through the Power of Attorney, a feature common to UACs (Sheikh & Banda, 2014; Zimmer, 2012). In 2009, certain blocks were granted a Provisionally Regularized Certificate, as part of the regularization drive under the Congress-ruled state government, but as of now, no legal notification has been issued.

The rapid rise in population impacted the social composition of Aya Nagar and its sociability. Subtle signs of fissure between the original residents of the village and the new incoming migrants are noticeable. Original residents are colloquially referred to as 'gaon-wale' (villagers) by the migrants while the original residents refer to the migrants as 'colony-wale' (residents of the colony) or 'bahar-wale' (outsiders); a distinction made clear in the otherising use of language. The rift between the two social groups was reflected in a conversation with a resident of Aya Nagar, Phase 5, who scorned over the dominance of villagers in the local residents' body: "*Most positions such as those of secretary are taken up by the Gujjars. They say we are outsiders.. They [the Gujjars] siphon all the money and spend it on alcohol.*" Conversely, conversations with residents of the village betrayed similar disdain towards the migrants. In the words of a resident of the Gujjar dominated Baba Mohalla, "*Ever since people from outside have come, it [the village] has become dirty.*"

Likewise, interviews also suggested at hints of bitterness between the dominant Gujjars and the Dalit residents of the village. The low-caste residents were resentful of the economic ascent of the Gujjars, who made vast immediate gains from the emergence of the local real estate sector. According to a Jatav resident of the village, "*The Gujjars sold all the land, and took away all the money. We received nothing.*"

2.2 Status of Water and Sanitation Services

Both Aya Nagar Village and Aya Nagar Colony suffer from poor provisioning of public services, especially in the case of water supply and sanitation facilities. The distribution of potable water supply varies across neighborhoods, and certain sections of the settlement lie outside of the public water supply network (see Box 1.a). Additionally, the infrastructural and institutional provisions for storm water drains were found to be lacking, with some parts of the settlements being altogether devoid of any storm water drains (see Box 1.b).

Box 1. Institutional set-up and service provision in Aya Nagar

Aya Nagar falls under the jurisdiction of the South Delhi Municipal Corporation (SDMC). As per the latest delimitation of municipal wards, it is a part of Ward No.73-S. The ward also includes the settlements of Jonapur, Ghitorni and Bhim Basti.

a) Water services

Water in Aya Nagar is provided by the Delhi Jal Board (DJB) through a combination of public borewells and water from the Sonia Vihar treatment plant. Supply of water differs from block to block. For instance, a resident of Phase 5, Aya Nagar Colony, stated the water supply to be satisfactory—receiving water daily from public bore wells between 7 a.m. and 1:30 p.m. The borewell supply is managed collectively by the residents, who have appointed individuals to regulate supply hours. Ironically, a resident of the Balmiki Mohalla shared that her household did not receive any supply from the pipelines connected by the DJB, and was entirely dependent on public water tankers for access to water. On the other hand, a resident of the Harijan Mohalla stated that households in his neighbourhood received DJB water supply daily, that alternated between borewells and the Sonia Vihar supply line from 10:30 a.m. –12 p.m.

Likewise, a wide inconsistency was also reported in the metering of water supply. According to a resident of Phase 1, Aya Nagar Colony, her household has been paying water tariffs from as early as 1988, whereas a resident Phase 6, Aya Nagar Colony, reports availing water free of cost. Multiple interviews with the residents of Aya Nagar Village also indicated water supply to be unmetered.

b) Sanitation Services

There is no sewerage network in Aya Nagar. Public sanitation facilities are limited to the management of storm water drains and solid waste. Storm water drains are managed by two agencies: the Public Works Department (PWD) and the SDMC. Within the SDMC, there are two departments that overlook the de-silting of storm water drains: the Engineering Department and the Department of Environment Management and Services (DEMS). The PWD is responsible for the maintenance of storm water drains of 5 feet and beyond; while the DEMS and the Engineering Department have a mandate over drains between 1.5–2 feet and 2–4 feet respectively.

Despite storm water drains being the function of three distinct state departments, in an interview with a sanitary inspector employed with the DEMS, it appeared that the DEMS was the only department maintaining infrastructure. According to the inspector, repeated requests to higher authorities within the PWD and SDMC, for increased staff support, were turned down due to an internal shortage of workforce. The DEMS, which is also responsible for solid waste management is severely understaffed, with only 40 sanitation workers employed for the entire population of Aya Nagar.

Solid waste management facility in Aya Nagar is poor. There is no designated site for the disposal of solid waste. Hence, sanitation workers employed with the DEMS are compelled to dispose solid waste in open public land. The unauthorized use of public space for waste disposal is often a cause for provoking the combined ire of residents and local leaders, which forces the DEMS to execute work through delicate negotiations with the settlement's inhabitants.

Furthermore, another significant concern regarding the management of solid waste is the lack of trucks. Consequently, transportation of waste to the Okhla landfill site takes place only once or twice per week.

As per Census 2011 figures, approximately 94% of the households in the settlement are connected to on-site, private septic tanks¹ and pit latrines. Residents are dependent on the labour provided by independent, small-scale septic tank emptying service providers who use privately owned mechanized means for the collection, transportation and disposal of faecal sludge. These service providers deploy use of locally customized technology, a

farm tractor that is attached to a cylindrical faecal sludge storage tank, manufactured from mild steel. The latter has a capacity of 6,000 liters. The tractor is ingeniously connected to a motorized suction machine which intakes the faecal sludge contained in a septic tank via a channel of plastic tube, and transfers it into the storage tank (see Figure 2).

Figure 2. An image showing the make of vacuum trucks used in Aya Nagar. August 2, 2016



Image source: Sweta Celine Xess

3. EMERGENCE OF THE INFORMAL SECTOR OF SEPTIC TANK EMPTYING SERVICE

3.1 The beginning of the service

A total of 12 business owners provide emptying services in Aya Nagar. Mechanical desludging services were introduced in the 2000s, roughly 15 years after the settlement began to urbanize. This time lag is likely to be due to a low recurrent demand for desludging. As shown in Table 1, in 1991, the settlement was significantly small, with only a total of 610 households.² In addition, the few households in the settlement that did require faecal sludge to be removed, still relied on independent scavengers hailing from the low-caste communities of the village, colloquially known as 'seefers(s)'. The seefers removed faecal sludge from septic tanks manually, using buckets and ropes, despite the activity being forbidden as per the Employment of Manual Scavengers and Construction of Dry Latrines (Prohibition) Act of 1993.

But by and large, the 1980s was a decade when the village was transitioning from the practice of open defecation to the use of

household toilets. Toilet construction in the village picked up pace only in the early 1990s, as open defecation sites began to shrink with the expansion of the unauthorized colony. It reached a higher proportion by the 2000s, coupled with unprecedented population growth; by 2001, the population of Aya Nagar had increased fourfold (Census, 2001). Eventually, the need for faecal sludge management services began to be acutely felt.

It was in the year 2002 that mechanical septic tank emptying service was finally ushered into the settlement. Raghbir, a Jat resident of Gurgaon was the first to provide this service. The emptying business was ventured into after the decline of small-scale agricultural trade. His operations were spread over the unsewered settlements along the Delhi-Gurgaon border (see Box 2).

Table 1. Decadal increase in the number of households in Aya Nagar since 1991

Year	1991	2001	2011
No. of households	610	2,619	6,757

Source: Census of India, 1991, 2001 and 2011

Box 2. Life stories of entrepreneurs: Raghbir

A tall, well-built man of 52 years of age, Raghbir is a septic tank emptying service provider from Gurgaon, Haryana who pioneered the service in Aya Nagar. His daily routine comprises a 13-kilometer commute, from his residence to Aya Nagar, on a vacuum truck that he operates by himself. Among the few service providers in the settlement aware of the Swachh Bharat Mission, when requested to give his take on the scheme, an unimpressed Raghbir replied in Hindi, heavily inflected with Haryanvi, "*Modi [the current Prime Minister of India] is only going about digging pits, but how those pits are to be emptied, no one knows.*"

Descending from a family of farmers in Jhajjar, Haryana, his engagement in the small-scale septic tank emptying sector started in the early 2000s, after the dwindling of his local animal fodder business, which he had set up in the year 1988. Raghbir migrated to Gurgaon after his family property was divided, which had left him with too small a piece of land to sustain on an income from farming alone.

His business had flourished for almost a decade, given the popularity of dairy production in the local economy, until the late 1990s when dairy production declined, and the demand for animal fodder began to dwindle. Therefore, in 2001, taking cue from his elder brother who operated a successful desludging enterprise in Chattarpur, a settlement 6 kilometers North of Aya Nagar, Raghbir too joined the septic tank emptying business.

For the first year of operation, he employed someone to operate the vacuum truck and serve the unsewered villages along the fringes of the Delhi-Gurgaon border. Soon after, Raghbir replaced the driver, deciding to man the vacuum truck on his own, out of the fear of accidents caused by negligent driving. That same year, he introduced mechanized emptying services to Aya Nagar.

In 2004, he was approached by Khem Chand, a resident of the Harijan Mohalla in Aya Nagar Village, who sought his advice on starting a similar enterprise. Raghbir keenly obliged, which culminated into a lasting friendship between the two. Khem Chand quit the sector eight years later owing to poor health, but not before initiating some of his friends and family members into the business, while still active.

Gradually, with the expansion of the sewerage network in Gurgaon, Raghbir's business became limited to areas in Delhi. At present, his service is primarily confined to Aya Nagar, with occasional travel to the neighbouring settlement of Ghitorni, which lies at a farther distance of 1 kilometer. He continues to further supplement his income with the animal fodder business, which is looked after by his wife. The occupation has shrunk from its former stature to now earn his family an income of merely Rs. 10,000 per month.

The mechanical desludging service in Aya Nagar is provided by an informal group of service providers who refer to their organization as an 'association'. It is an unnamed and unregistered body, which has members who work in mutual cooperation in order to check competition, regulate service tariffs and organize work allocation. In this report, we use the terms 'collective' and 'cartel' interchangeably to describe the functions and strategies of the organization wherever appropriate.

3.2 History of the collective

In the early years of the service's operation the emptying service was characterized by high tariff rates. Supply was inconsistent, with only a handful of operators engaged in its provision. Providers were based out of distant non-sewered settlements where local markets were already in existence, including areas like Gurgaon, Chattarpur and Bijwasan, among others. Slowly, as the settlement expanded, so did market participation. Starting in 2004, residents of Aya Nagar began getting involved in this business. During this decade, three residents entered the sector. Given little market competition, these operators charged remarkably high fares that ranged between Rs. 800 to 1,000 per trip³, servicing an average of three clients per day.

This trend, however, was disrupted in the following decade, as more players started to join the sector and some kind of competition came about. Five residents from Aya Nagar ventured into the business in the 2010s. Simultaneously, there was also an increase in the count of non-resident service providers. While it is difficult to ascertain the exact number of non-resident service providers, it can be claimed that at least four individuals from Jonapur, a settlement located a kilometer away from Aya Nagar, also entered the sector the same decade. Therefore, as a result of increased market competition in the mid-2010s, the service tariffs dropped to half of what was being charged previously.

The reduction in tariffs led to the departure of competitors hailing from distant settlements, who were ousted organically due to high fuel costs. But despite their withdrawal from the local market, the sector continued to be fraught with an aggressive price war between resident service providers and those from Jonapur, whose operational costs were only marginally higher given the settlement's close proximity to Aya Nagar. Additionally, operators from Jonapur had ownership to larger fleets of vacuum trucks and they attracted more clients by offering services at highly competitive prices that could sometimes fall as low as Rs. 300 per trip.

The onslaught of market competition severely impacted the service providers of Aya Nagar, who were mostly single truck operators. They felt an urgent need to restructure the market given their inability to withstand competition from the multi-truck business owners. The disparity in the earnings of single truck vis-à-vis multi-truck ventures has also been highlighted in studies by Chaudhry and Kone (2012), and Collignon and Vézina (2000) on

similar businesses, operational in Africa and Asia, which indicate enterprises with at least two vacuum trucks to be more profitable.

Thus in the face of declining revenues, in September 2016, the resident operators united to form a cartel in order to increase the tariff rates. They tried to impose an informal prohibition on the entry of the competitors into servicing clients in Aya Nagar that failed in its implementation, as the new tariffs led to the slippage of the local clientele in favor of the competitors. Interviews suggest that almost all of the local customer base shifted towards the operators from Jonapur, who continued to offer services at lower rates. Hence, in strategic afterthought, the resident operators invited the competitors to join them and benefit mutually from an increment in fares. The proposition was welcomed by the competitors, who agreed to collaborate, in the interest of economic gain. Thereafter, the operators functioned jointly in the provision of emptying service in Aya Nagar.

The local collective operates out of an expansive open land, located along the peripheral boundaries of Aya Nagar, adjoining Jonapur. The land, which is officially designated for use by the Jatav community of Aya Nagar Village, is a source of contention between this group and the Gujjars. The Jatavs accuse Gujjar land sharks of vandalism and attempts to land grab due to the attraction of its escalated real estate value. Thus, on behalf of the collective, resident operators belonging to the Jatavs caste have offered community leaders the assurance to watch over the land for further acts of vandalism, in exchange for access. The operators ensure the ground's maintenance and incur no rental costs for its use.

The competitive market conditions caused the existing business owners to transition from the originally individually run enterprises to the joint operation that it stands as today. The decision was taken in order to mitigate the price war that arose out of increased supply of desludging service. The operators came together with an understanding of self-regulating their businesses for the greater benefit of all those engaged in the sector.

4. SOCIO-ECONOMIC CHARACTERISTICS OF THE SERVICE PROVIDERS

Our observations indicate that the respondents have switched from farm-based occupations to numerous non-farm petty trades owing to expansion of the local real estate market. Their previous occupations range from in-situ, service-based occupations to minor trade activities in the local market. This kind of shift in economic activity is often underpinned on social networks, which allows ease of entry to those transitioning from one kind of occupation into another.

In the context of desludging activity, social networks allow three benefits to intending investors: (i) dissemination of knowledge (ii) distribution of economic benefits and (iii) informal financing. Additionally, these networks promote solidarity between operators against competition. The providers also engage in alternate businesses apart from septic tank emptying as supplementary sources of income in areas such as small-scale trade, service-based activities and the rental sector. These could be the primary or secondary source of income, depending on the operator's economic background.

4.1 Social characteristics

All members in the business are long-term residents of their respective settlements. Five of them belong to the Aya Nagar Village, of which two are migrants from Uttarakhand and Haryana, who moved to the colony in the 1990s. Among the non-resident respondents, two hail from Jonapur Village, and one is from Gurgaon, who moved there from Jhajjar, Haryana in the late 1980s.

The collective has the highest representation from the Jatav caste, all of whom hail from Aya Nagar Village. These individuals, five in total, are closely related through familial ties. The Gujjars come second in representation with four members in total—all four are residents of Jonapur Village. Lastly, the collective has one member each from the Brahmin, Jat and Vaishnav caste group. The latter belongs to the category of Other Backward Classes (OBC).

Table 2. A typology of various characteristics of the service providers.⁴

S.No.	Name	Age	Year of entry into septic tank emptying sector	Place of residence	Caste	Religion	Education	No. of trucks owned	Previous occupation(s) (in order of most recent to oldest professional engagement)
1	Raghubir	52 years	2002	Gurgaon	Jat	Hindu	Class 10	1	Retail of animal fodder
2	Tejpal	39 years	2007	Aya Nagar	Jatav	Hindu	Class 8	2	Cab driving, automobile repair service
3	Vinay	21 years	2009	Aya Nagar	Vaishnav	Hindu	Class 8	1	First and only occupation
4	Uday Ram	38 years	2012	Aya Nagar	Jatav	Hindu	Class 9	2	Carpentry, vegetable vending, freight service using tractor tailors, cab service
5	Vikram	28 years	2013	Aya Nagar	Jatav	Hindu	Class 9	1	Cab service, mobile phone repair service
6	Balraj	48 years	2013	Jonapur	Gujjar	Hindu	Class 10	5	Private water tanker supply
7	Tek Ram	27 years	2014	Jonapur	Gujjar	Hindu	Information unavailable	3	Automobile repair service
8	Mangal	36 years	2016	Aya Nagar	Brahmin	Hindu	B.A	1	Automobile repair service
9	Satbir	32 years	2016	Aya Nagar	Jatav	Hindu	Class 8	1	Cab service
10	Snehpal *	49 years	2016	Aya Nagar	Jatav	Hindu	No education	-	Vegetable vending, provision of buffalo driven carts

*The individual operated in partnership with his nephew Satbir.

A chronological analysis of the growth of the business in Aya Nagar shows that in the beginning the sector was marked by the involvement of mostly those from lower socio-economic strata. However, in the last four years, individuals from the higher socio-economic order—such as the Gujjars and the Brahmins—have also started entering the market (Table 2). Across the collective, educational qualification is low, with most having discontinued schooling before completing higher-secondary levels. Only one individual, a Brahmin, has an undergraduate degree. He was convinced to join the profession at the suggestion of his friend, a Jatav service provider, after the decline of his local automobile repair shop.

Prior to joining the septic tank emptying business, the service providers were involved in petty occupations in the local economy like cab service, automobile repair service, private water supply, mobile repair service, among others (see Table 2). The occupations were however unstable and lasted for a short duration of time until it gave way to a more profitable venture.

Six operators entered the emptying business after the decline of their local non-farm occupations, while two moved into the business with the intention of taking up an occupation that afforded greater leisure. For example, Satbir, who previously owned a cab that he drove for a multinational company in Gurgaon, narrated, *“I had to travel a lot in cab driving. Driving requires one to wander all over the world with no fixed timings. At least this job can be done from home.”* Likewise, as put by Snehpal, a 49-year-old service provider who used to sell fruits at the local market before this, *“There is more free time in this work. In fruit vending there was more labor. I’d have wake up early in the morning go to the market. Now that I’m aging, there’s only do so much I can do.”* Additionally, one service provider decided to start this business to expand his sources of supplementary income, while another took it up at the age of 13 years, after the death of his father who had originally set it up.

4.2 Alternate economic activities

Most operators engage in a range of economic activities other than septic tank emptying business. These occupations include small and medium scale local enterprises such as tent-house business, private water tanker supply, commercial freight service and automobile repair among others (see Table 3). Three operators regarded the desludging business a ‘part-time’ activity as a large part of their earnings were accrued from property rental. Three others considered the emptying enterprise as their prime source of income, which was supported by petty trades. Only two owners were dependent on desludging activity as their sole means of income.

The findings indicate that a direct correlation can be drawn between ownership of property and the scale of their desludging activity. The Gujjars, given their history as landowners, have had access to surplus capital owing to their investments in property and rental market. After the decline of farming the surplus was diverted into multiple non-farm occupations, with the emptying business being just one among the many. This advantage is clearly indicated by the fact the Gujjars own comparatively larger fleets of trucks vis-à-vis their counterparts from Aya Nagar. As per observations, they also held considerable socio-economic superiority and political clout, which may have contributed to their ability to thwart attempts by the latter to curtail their movement.

4.3 Role of social networks in market entry and regulation

The collective is made up of two distinct social groups whose members share either kinship or friendship. The first social group is dominated by the Jatavs of Aya Nagar, while the second constitutes the Gujjars of Jonapur. It has no single appointed leader and is implicitly led by two individuals, Tejpal and Balraj, who represent the interests of service providers of Aya Nagar and Jonapur respectively. Both of them emerged as leaders organically, owing to their personal authority, relative experience

Table 3. Alternate occupational activities of the operators

Caste	Tent-house enterprise	Retail of animal fodder	Real estate and rental market	Automobile repair	Commercial freight service	No alternate enterprise
Jatav	Uday Ram		Tejpal, Vikram			Snehpal
Gujjar	Balraj		Balraj, Tek Ram	Tek Ram	Tek Ram	
Jat		Raghubir				
Brahmin				Mangal		
Vaishnav						Vinay

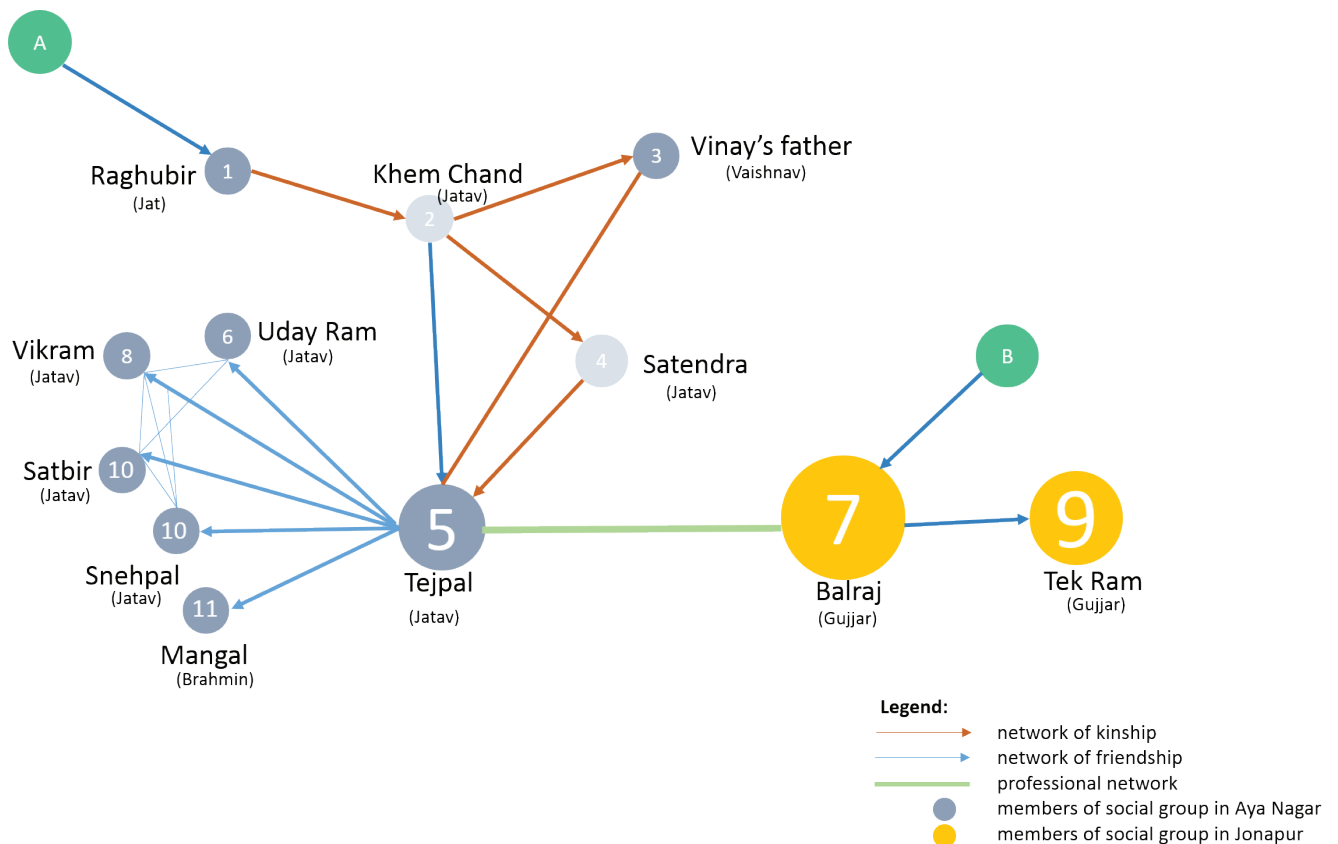
Note: The table represents the simultaneous occupational engagements of the service providers in the local sector with respect to their caste. Each cell indicates the various operators in a particular activity.

in the sector and economic stature among colleagues. For instance, Tejpal, a Jatav, is the wealthiest and amongst the most experienced of service providers in Aya Nagar (see Box 3). Likewise, Balraj is the first to enter the business from Jonapur and owns the largest fleet of trucks in the market.

All service providers in the collective were introduced to the occupation by trusted friends or family members who were already part of the sector. They were provided with necessary information pertaining to capital investment, procurement of infrastructure and cost of operation. Kinship appears to be the most dominant form of social network, with nine of the total number of service providers—including both former and present—being encouraged by a family member to join the occupation. Three service providers entered the business at the suggestion of friends (see Figure 3).

Social networks also feature in mobilizing investment, most notably for the Jatav service providers who borrowed capital from one another to start their enterprises. The significance of social networks in Dalit entrepreneurship has been highlighted by Jodhka (2016), who attributes this dependence to their historical deprivation of land. In addition to this, these operators also use existing kinship ties to ease the burden of operating a business individually. They regard their individually owned businesses as part of the family enterprise, with every relative volunteering to oversee operation at different hours of the day.

Figure 3. An illustration portraying the chronological foray of service providers into the septic tank emptying market in Aya Nagar and the existing social networks.



Note: The illustration depicts the two social groups present in the market. It highlights the chronological entry of 12 operators (both former and existing) into the business. The size of the shapes is proportional to the number of vacuum trucks owned by an operator. The individuals Khem Chand and Satendra were no longer part of the business at the time of investigation, but had nevertheless encouraged new entrants into the business while they were active. Individuals A and B designate unknown operators who influenced Raghubir and Balraj respectively into entering the profession. They were immediate family members and operated in other areas.

Box 3. Life stories of entrepreneurs: Tejpal

A portly man of 37 years, Tejpal is the unofficial leader of the service providers from Aya Nagar. He owns two vacuum trucks that are operated by his employees. A Jatav, hailing from Harijan Mohalla in the village, he is the wealthiest among his colleagues in Aya Nagar.

Tejpal's parents had engaged in the local trade of animal fodder in the heydays of dairy production. He received his education from the government school in the village, but chose to discontinue after Class 8 due to waning interest. His first professional experience came at the age of 16 years, working as an apprentice under a motor-mechanic. Two years later, in 1998, he ventured out independently to run a motor-mechanic and spare parts shop out of Jonapur. As years progressed, the business prospered and grew to employ almost 20 workers at its peak.

The urbanization of Aya Nagar brought new economic opportunities in the 2000s. In 2005, the construction of the Delhi Metro Rail network linking it to Gurgaon, offered Tejpal the opportunity to diversify his occupations. Following in the footsteps of his older brother, Khem Chand, he got himself commissioned by the Metro Corporation to provide cab services to its employees. Three Tata Sumos—a popular small utility vehicle—were procured on bank loans. Other members of his family followed suit as the business prospered, which increased the total count of vehicles to 12. Some of these were also hired by multinational companies operating in Gurgaon and Manesar.

However, in 2008 the contract with the Metro Corporation expired and in the meanwhile, his spare parts shop also declined due to poor managerial decisions. Subsequently, Khem Chand, who was the first resident to enter the local desludging market in Aya Nagar, advised Tejpal that he too take up the activity. Heeding to his advice, Tejpal then procured second hand infrastructure from his friend Satendra, who was planning to leave the business around the same time.

Since joining the business, Tejpal has mentored four of his family members—three nephews and a cousin—and one friend with ailing businesses, to join the local septic tank emptying sector. He also owns considerable stakes in the local real estate sector, which earns him Rs. 70,000 per month.

Tejpal, given his social and economic credibility, is highly respected among his colleagues. His entrepreneurial spirit is lauded by the Jatav community, which has allowed him to move to the colony, where he now lives in a double-storied house, overlooking the village.

5. OPERATION OF THE SECTOR

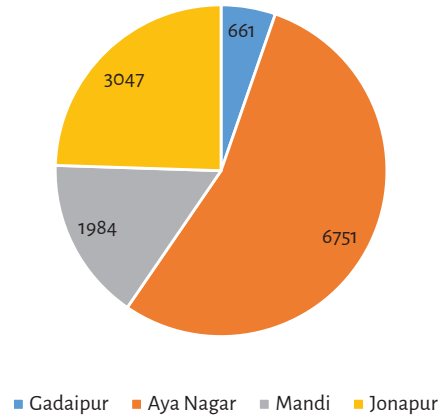
This section explores the informal rules that govern the operation of the collective. This collective holds a monopoly over service tariffs that is established through territorial control. The operators work in mutual cooperation and principles of equity to keep a check on prices and limit competition. Violation of these norms is met with penalization. The group fosters an environment of friendship between members, which helps in reducing business risks.

5.1 Spatial scale of operation

The informal jurisdiction of the collective includes Aya Nagar, Jonapur, Mandi and Gadaipur (see Figure 4). This territory comprises of 12,451 households and Aya Nagar is the largest settlement in it, with 54% of all households. This is followed by Jonapur, Mandi and Gadaipur, which comprise 24%, 16% and 5% respectively (see Figure 5). Mandi is the farthest settlement, located 7 kilometers away from Aya Nagar. The service providers charge clients between Rs. 650 to 700 per trip, depending on whether a client is an original resident or a migrant. Original residents are charged a discounted tariff of Rs. 650 as an act of social obligation.

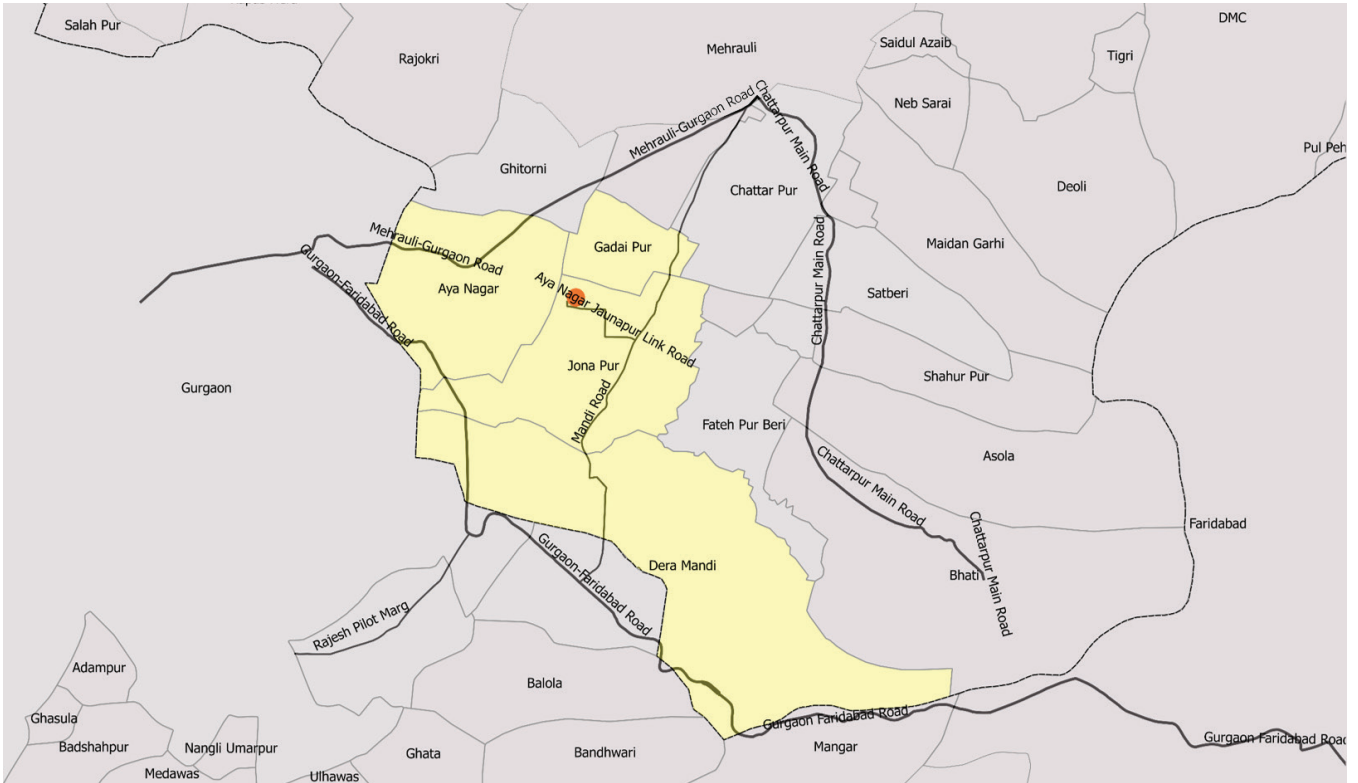
These spatial boundaries emerge in the context of similar organized collectives operational in surrounding settlements. Collectives are often in tacit agreement against intrusion into one another's spatial boundaries. The offending operator is imposed with a fine of Rs. 2,000 by the group to whom a territory belongs.

Figure 5: No. of households within each settlement in the spatial territory of the collective

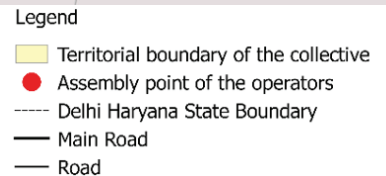


Source: Census of India, 2011

Figure 4. Map highlighting the territory of the cartel and routes commonly used for navigating between settlements



Source: Google Earth and MCD ward map of Delhi
 Draft: Sweta Celine Xess
 Cartography: Deepti Raj, Centre for Policy Research, New Delhi



The cartel in Aya Nagar distributes any fine collected equally among workers as payment for food and alcohol. Usually, the workers are granted cash handouts of Rs. 100 on a daily basis by their respective employers to cover these expenses.

The spatial limits of the Aya Nagar collective are determined by traffic police beats, which are points that oversee vehicular flow. The tractors used by the service providers are registered for agricultural use, as opposed to commercial, thereby making them liable to being fined if caught. In order to evade such fines, service providers abstain from plying along traffic police beat routes, the result being that all four settlements covered by the collective lie within the confines of one single traffic beat.

The service providers are, however, free to expand beyond these spatial boundaries at their own risk. Some service providers cater to settlements in both Delhi and Gurgaon and provide additional services to public institutions, commercial offices and resorts. To circumvent traffic violation penalty, they resort to bribes, either on a monthly basis or as one time payments. The average monthly bribe amount in Delhi and Gurgaon is Rs. 900 and Rs. 800 respectively, and the one-time payment could range from Rs. 300 to 500. As a result of these informal costs, five service providers—four from Aya Nagar and one from Gurgaon—avoid operating outside of the local boundaries.

Since the costs of operation are higher when travelling to locations outside of the local four settlement boundary, some operators choose to work early in the morning as a cost-cutting measure. For example, Randhir, who also occasionally services the settlement of Mehrauli—a non-networked residential settlement situated 11 kilometers North of Aya Nagar—starts work at 6 a.m. when police patrolling is at its weakest. Due to the long commute and higher risks involved, he charges a tariff of Rs. 1,500 per trip.

5.2 Sequential allocation of work

Vacuum trucks are assembled at a common gathering ground in Aya Nagar every morning at 9 a.m. The daily operation of work is overseen by volunteering members of the Jatav family that dominates the collective.

Desludging assignments are allocated sequentially between the service providers. The volunteers ensure that each service provider is allocated clients proportional to the number of vacuum trucks he owns. There is mutual trust and a crude written record of the daily work is maintained, which everyone is free to verify and demand remedial measures in case of discrepancies. A fine of Rs. 2,000 is imposed on a service provider if found catering to clients within the spatial boundary, without the knowledge of the collective. This fine is also applicable to the employees. Once again, the fine collected is distributed among the workers as expenses for food and alcohol.

The service providers hailing from Aya Nagar are given an advantage when it comes to the distribution of work; all their vacuum trucks are listed for operation, whereas those from Jonapur have only one vacuum truck per individual as part of the collective.

The number of clients served by the operators ranges between one to five clients per day. The demand for the service is highest on weekends when a provider can service four to five customers in a day. This figure plummets during weekdays when they may service between one to three clients a day.

5.3 Cooperation among operators

The collective functions in an environment of cooperation between members. Most service providers assemble daily to assess progress. This offers members the opportunity to share both professional and personal aspects of their everyday lives. The collective also promotes networks between the Jatavs and the Gujjars, who otherwise share disparate social relations. For instance, Balraj, the Gujjar service provider from Jonapur, who operates a tent-house business alongside, often lends portable toilets to his Jatav counterpart Uday Ram, who runs a similar enterprise of a smaller scale in Aya Nagar, free of cost.

The amicable relations between the service providers also facilitates the mitigation of operational risks in the business, such as cooperation between colleagues when workers are unavailable. It is common for service providers to share employees with one another in the absence of a worker. Employees are free to replace an absent worker for a day, against a daily wage of Rs. 350, or alternatively at Rs. 50 per trip. No extra payments are made to the original employer in exchange. Additionally, some service providers share infrastructural material such as suction pipes and repair gear with each other.

5.4 Relationship with customers

The collective makes note of transgressions made by clients, such as if they refuse to pay the agreed fee. Offenders are denied future service, until the clearance of previous dues. Apart from emptying septic tanks, the service providers also clear storm water from drains during monsoon at a significantly discounted tariff of Rs. 200 per trip. This is understood to be a part of their social obligation, as rationalized by Uday Ram, *“The lanes are used even by us, so how can we charge more? In a way it is for a social cause.”*

The operators also impart residents with free consultation on emptying, repair and construction of septic tanks. In the absence of any institutional provisions for residents to approach regarding faecal waste management, the service providers—despite lacking any formal technical training—bridge this gap by disseminating information based on their tacit knowledge of these matters, accumulated over years from experience. They help residents navigate through issues like the costs involved, the

size of infrastructure, manual cleaning and other such matters. Two service providers also function as middlemen in connecting residents to other informal actors in the local sanitation sector, such as manual cleaners, septic tank repairers and masons, for a fee of Rs. 500.

5.5 Residents' perception of the association

The hike in service tariffs, following the formation of the collective, was received negatively by most residents. A resident of the Gujjar dominated Baba Mohalla stated, *"We are helpless. Neither can we keep it [faecal sludge] at home, nor can we dispose it on our own. We have to give in to whatever they demand."* Observations during fieldwork also brought forth instances of drivers occasionally entering into verbal duels with clients over payment of tariffs.

The tariff hike was also disapproved by local level politicians, who criticized the collective for having monopolized the market. The leaders described its practices to be equivalent to a 'union'

and denounced the forceful implementation tariffs akin to 'public looting'. One such account of this shared contempt was that of the Ward Municipal Councillor, who condemned the operators for operating under a 'rule of will and whim'.

Similarly, the party workers belonging to the Aam Admi Party⁵ accused the cartel of fleecing the residents, claiming that their repeated requests to operators to overturn the hike had been futile. They criticized the operators for prohibiting the entry of competitors who were willing to offer service at cheaper price points. This accusation was contended by the service providers who claimed to be powerless in spatially regulating competitors from entering the market in Aya Nagar.⁶ They argued that non-member service providers, in fact, chose to not service the settlement given the greater travel costs involved. Moreover, it was claimed that whatever competition was existent in the past had been contained with the absorption of competitors from Jonapur into the collective.

6. FINANCIAL ACTIVITY

The business of desludging septic tanks is characterized by low entry barriers, which is enabled by easy availability of finance and little capital investment. It is financed primarily through a combination of personal savings, and formal and informal loans (see Box 4).

The tractors, which form the bulk of capital investment, are mostly purchased from registered dealers based in Haryana, at an average retail price of Rs. 5,16,000 (see Annexure 2). They are chiefly sourced through vehicle bank loans, which are financed against a reported down payment of 30% of the retail value. The loan duration ranges between one to four years—three years being the most favoured—at an average monthly installment of approximately Rs. 13,000 per month. The tractors are registered for agricultural use with the Haryana Transport Department.

The septage container is procured outright at an average cost of approximately Rs. 1,53,000. Most service providers have opted for

newly manufactured containers from Sampla, Haryana. Only one service provider resorted to the use of a second hand container, which was procured from Najafgarh, a settlement 30 kilometers from Aya Nagar at a cost of Rs. 68,000. The containers have a shelf life of three to four years, due to low quality of manufacturing.

The septic tank emptying business earns the service providers an average monthly profit of approximately Rs. 20,000 per vacuum truck (See Box 5). The profit, which has been calculated after the deduction of monthly loan installments, is estimated to increase much more once the loan cycle completes. The existing income was found to be greater than the revenue earned from alternate small scale occupations for three of the service providers, who also engaged in petty part-time occupations such as animal fodder retail and automobile repair.

Box 4: Sources of investment

The informal sources of lending used by service providers in the septic tank emptying sector include the following:

- Borrowings from friends and family: it is the most popular form of lending in the market with five operators having borrowed from close friends and family members to invest as capital. These loans were free of interest.
- Savings: property rental and chit funds were also common among operators. Of the five providers with savings in the rental market (see Table 3), one explicitly stated having circulated it into the emptying business. Two operators partially invested from chit funds.
- Informal lenders: this was a source of finance for those without personal networks for borrowing. Only one service provider appeared to have borrowed from this source, at a remarkably high interest rate of 24% per annum.

Box 5: Monthly costs, revenue and profit

The operational costs, revenue and profit have been deduced after averaging the expenses borne by individual operators on capital, fuel, labour, maintenance and disposal, among others, for one single vacuum truck (refer Annexure 1 for details).

Monthly costs	
Capital cost	Rs. 13,283
Operational costs	
• Fuel	Rs. 18,080
• Maintenance	Rs. 1,000
• Labour*	Rs. 9,063
• Bribes and fines	Rs. 357
• Disposal cost	Rs. 2,415
• Rental of space**	Rs. 0
Total	Rs. 30,915
Grand total	Rs. 44,198

Monthly revenue, costs and profit	
No. of trips per month	92
Service tariff per trip	Rs. 700
Monthly revenue	Rs. 64,400
Monthly costs	Rs. 44,198
Monthly profit	Rs. 20,202

Note: *The labour cost is inclusive of expenses borne for the provision of accommodation, and daily meal and alcohol to workers.

** The operators bear no rental costs for parking of vehicles as it is availed for free through negotiations with community heads.

7. DELIBERATIONS ON THE FORMALIZATION OF THE SECTOR

This section explores the various ways in which the service providers react upon the formalization of the sector, with respect to the existing regulations on faecal waste management issued by the Delhi Jal Board, the nodal state authority on the management of sewage. Formalization, as per its regulations, entails commercial registration, adherence to standard service tariffs, liability to labour training and safety measures, and authorized disposal practices.

7.1 Background to the Delhi Water Septic Tank Waste Management Regulations 2015

The Delhi Water Septic Tank Waste Management Regulations 2015, issued by the Delhi Jal Board under the Delhi Water Board Act 1998, mandates the collection and transportation of faecal waste to be carried out only by agencies holding valid licenses authorized by the agency.

It deems vacuum trucks functioning without a valid license, and dumping of faecal waste at any non-designated location, to be punishable as per law (DJB, 2015). The regulatory framework requires the informal service sector to obtain authorization from the DJB and the issuance of licenses, after meeting prescribed eligibility criteria such as valid transport permit, safe containment infrastructure, trained staff and provision of safety gears (see Box 6). The licensed service providers are also required to adhere to standard tariffs rates dictated by the DJB, violation of which amounts to the cancellation of their licenses.

However, all service providers interviewed during this study were unaware of the existing DJB regulations. On the contrary, they contested the DJB's claim over sewage management and asserted its responsibilities to be limited to only water services. Across the collective, service providers argued that faecal sludge management was indeed a mandate of the municipal authority, with one service provider even having approached the zonal municipal office in the past to plead registration of his business.

7.2 Costs to formalization

From the responses gathered in this study, the service providers, although ambivalent, for the most part argued against licensing.

The first reason being that licensing would entail commercial registration of tractors, which would require regular payment of vehicular taxes, and mandate periodic renewal of license. It was feared that this would elevate the cost of operation. The second argument against formalization was concerning the standardization of service tariffs. At present, the tariff rates are kept flexible in order to account for households whose septic tanks are hard to access by a tractor. Such households are charged anywhere between Rs. 850 to 1,000 per trip, as use of longer pipes induces strain on the suction machine, thereby escalating the fuel costs. Lastly, the operators were against formalization on the grounds that it would entail commercial taxation on the business.

Nonetheless, the one area where the need for state intervention was felt unanimously across the collective was regarding the lack of options for faecal waste disposal. The operators currently have to negotiate with farmers and farmhouse owners of Jonapur regularly for the disposal of sludge. It is utilized as a substitute for non-potable water for farming and watering of lawns (see Figure 6).

The increased supply of sludge over the years has compelled landowners to attach a tipping fee for disposal. The fee is seasonal and contingent upon sludge demand. It is highest during monsoons—due to natural irrigation of land—and lowest during summers. The charges for disposal in monsoon amount to Rs. 150 to 200 per trip. In summers, this fee reduces to Rs. 10 to 60 per trip, or occasionally exempted from any charge when water stress is severe.

Some operators also dispose faecal waste into storm water drains. These are accessible against a payment of monthly bribes to the traffic police. Individual service providers incur an expenditure of Rs. 1,000 per month. The family of Jatav operators bribe Rs. 10,000 per month collectively. One entrepreneur bore no disposal costs as the sludge was disposed discreetly in the forest cover near Jonapur.

Thus given the uncertainty over disposal costs and availability of land, the operators voiced a need for a state authorized site where sludge could be disposed all year round.

Box 6: Salient features of the Delhi Water Board Septic Tank Waste Management Regulations 2015

The Delhi Water Board Septic Tank Waste Management Regulations 2015 mandates collection, transportation and disposal of septic tank waste only by service providers holding authorized license. The license is valid for two years unless revoked and is subject to the fulfillment of the following criteria:

- **Adherence to vehicle standards**

The service provider must own a leak, odour and spill proof transporting vehicle with proper vacuum/suction and discharging arrangement authorized by the DJB. They must hold valid permit from the Transport Department to operate in Delhi. The vehicle carrying septage should be fitted with prescribed equipment to take care of pollution in case of accidents.

- **Adherence to service tariff**

The user fee will be prescribed by the DJB and amended from time to time. Further, the licensee cannot charge an amount that exceeds the prescribed fee. Any such demand would make the licensee liable for cancellation.

- **Disposal of faecal waste**

Faecal sludge should be disposed only at authorized sewage treatment plants or sewage pumping stations.

- **Worker training and safety measures**

The service provider should be trained for this purpose, and should be equipped with safety gear and other protective equipment required to safely collect, transport and dispose faecal sludge.

- **Liability to worker safety and training**

Service providers will be liable to provide protective gear such as gas masks and oxygen mask among others. They shall be responsible for regular training of the staff and provide health checkups and insurance.

- **Liability to accidents and damage**

The licensed service providers will be culpable for any damage caused to a person, property or environment in the event of an accident or disaster.

Figure 6. An image showing untreated sludge being emptied in one of the many agricultural farms in Jonapur. 4 March, 2017



Image source: Sweta Celine Xess

7.3 Labour safety

The service providers offer employees no training on desludging or safety precautions. New employees are put under the apprenticeship of more experienced workers for a period of two days, after which they are required to work independently. Even though operators claimed the procedure to be safe for employees, given its mechanization, dangers of practice were implicitly acknowledged. The operators did recognize the harmful effect of exposure to noxious and flammable gases on the physical health of workers, but this did not lead to distribution of protective gear among them.

Further, even though mechanization does eliminate safety and health hazards to some extent, observations indicate that the

use of low-cost inefficient machinery has not been successful in eliminating the practice of manual scavenging. The machines used at present are of a low quality that are ill-equipped to handle solidified faecal matter deposited at the bottom of tanks. Residents resort to the services provided by the seefers who have to enter tanks and break the sludge manually. Even though this requirement can be eliminated with the use of the professional desludging trucks, the owners expressed reluctance to procure such machinery out of speculation that it would entail higher capital investment.

8. EMBEDDEDNESS OF THE SECTOR WITH SANITATION WORK AND CASTE

This section explores the intersection of the business with sanitation work. Septic tank desludging, although mechanized, is a stigmatized occupation due to the traditional association of human excreta with low-castes. However, as per observations, the activity has at the same time presented low-caste entrepreneurs the opportunity to persevere economically.

8.1 Shortage of workers

The emptying sector is beset with a severe shortage of workers. This challenge is twofold, for not only is locating workers adept at driving tractors in the urban center of Delhi difficult due to the decline in agricultural activity; many informal workers hesitate from entering the sector. There are two reasons for this, the first of which is rooted in aesthetic concerns.

According to the service providers, workers do not want this job as it requires daily engagement with repulsive sights of faecal waste and odour. This was pointed out by Tejpal, who noted: *“Who would like look at septic tanks early in the morning? One has to take in the stench. This activity can only be done by people who don't mind doing such kind of work. I could offer someone Rs. 20,000 to do this work, but they might still refuse to take it up, such is the work.”*

The second cause for anxiety among potential workers is the concern for social shaming. This came up during multiple conversations with existing workers, who claimed to hide their professional identity from their social circles in their home turfs, due to fear of scorn and ridicule.

As a result of this, there is dire shortfall of workers in this sector. Some operators travel occasionally to rural districts of Haryana, located 35 kilometers away from Aya Nagar—where the pool of individuals with tractor driving skills is generally higher—looking for people to employ. Hence, even though modernization of sanitation infrastructure is often touted as means of purging caste from the sector, as findings suggests, it remains more of a wishful thinking.

8.2 Attitude of operators towards the sector

The service providers were deeply aware of the social stigmas attached to their business activity given its engagement with human excreta. Most operators refused to operate tractors on their own due to sludge removal being regarded a menial activity. On multiple occasions operators opined that the activity of desludging was deemed fit only for persons from the Balmiki community. As was expressed by Tejpal: *“This work involves cleaning people's latrines. It can only be done by Balmikis. If one can afford a driver they will get it done through them, but under no circumstance will one do it on their own. Those who do, do it out of compulsion.”*

Nonetheless, it was found that assigning desludging tasks to employees did not insulate operators from experiencing stigma. For instance, Satendra, a former Jatav operator from Aya Nagar Colony, recounted being shamed by close friends for being in a business that involved operation of a ‘toilet-waali-gaadi’ (shit-carrying vehicle). Further, some providers did not wish for their children to take up the activity due to it being socially regarded as ‘ganda’ (dirty). Instead, they justified their own engagement to the lack of alternative skills, education and poor financial condition. For example, Raghubir expressed a desire to leave the sector once his college educated children found jobs in respectable fields. *“I will never let my children do this work because it is a dirty job. I've invested so much money in their education, so that they wouldn't have to take up such a job. I do it out of compulsion.”*

8.3 Residents' perspective towards the low-caste providers

The surge in the demand for sanitation services in Aya Nagar has led to a palpable change in the traditional social structure of the village. The Jatav operators who were once placed low on socio-economic ladder have shown significant upward mobility. As per observations, this was perceived very differently by the upper and low-caste groups in the village; for while on the one hand, the Gujjars expressed dismissiveness, the Dalits were approving of the family's economic achievements. Take for instance a statement offered by a Gujjar resident: *“Gujjars will never enter this trade. One has to get their hands dirty and enter septic tanks. They [the Jatav operators] have now become 'crorepatis'. Look at them now, they earn nothing less than Rs. 25,000 per day!”* Conversely, the narratives shared by low-caste residents echoed support and empathy for the Jatav operators. Some community members even argued in defense of the cartel, justifying it as means of protecting their ‘rozi-roti’ (livelihood). The shared sense of solidarity was most emphatic in a statement offered by a Balmiki resident: *“They [the Jatav operators] have made a lot of progress and will continue to do so in the future.”*

CONCLUSION

The localized informal market for septic tank emptying services in Aya Nagar is a thriving enterprise that emerged organically in response to the development of the informal settlement. It functions in the interstices of the state that resulted out of unavailability of public sewerage and faecal waste management services in the settlement.

The sector is a convenient entry point for entrepreneurs looking to invest on a small scale. It has low entry barriers notably, low capital costs and technical know-how. Most entrepreneurs were residents of the unsewered settlements themselves, owning small-scale businesses comprising of either one or two vacuum trucks. They harboured strong ties of kinship and friendship with another, and were organized into a cartel to check competition and foster cooperation. This association was however unstable for, in October 2017, when the settlement was visited again, the cartel was found to have disintegrated. It was unable to withstand competition against a new, larger-scaled, entrepreneur who offered service at Rs. 400 per trip. This subsequently led to another round of price war, which caused the remaining operators to drop their tariffs. Thus, the emptying market in Aya Nagar has an unstable character. Operators have to continually mould their practices in order to adapt to market competition. Having said that, the adoption of self-regulatory measures heralds a stage where more complex forms of organizational arrangement are being felt by entrepreneurs for the improved performance of the sector.

Further, even as the state is gradually beginning to recognize some of the concerns, through introduction of regulatory frameworks

such as the Delhi Water Board Septic Tank Waste Management Regulations 2015, these measures are far from striking a chord with the needs of operators. In its current form, the regulatory terms appear more punishing rather than acting towards the betterment of the sector. Much of its weight is disproportionately placed upon service providers, who view the regulations as disincentives to formalize.

Nonetheless, state regulations are of crucial necessity to sector in order to contain some of the unsafe practices currently in place. For example, the discharge of faecal sludge in storm water drains and agricultural land can severely jeopardize public health. Moreover, workers are not provided with any protective equipment or training, even though they manage hazardous waste. Further, the other issue which the regulations fail to address is the pernicious hold of caste on sanitation work. The emptying sector is intertwined with caste-based discrimination, which makes it an unattractive work opportunity for the informal labour force. As a result, operators are burdened with acute shortage of workers, which render difficult day-to-day operations of the business. Thus, caste cannot be eluded from the debate on formalization if sustainable on-site sanitation service is to be made a reality. The lessons from Aya Nagar call for a more proactive role of the state if the faecal waste management sector is to be strengthened in the interest of service providers, workers and customers alike.

NOTES

1. Septic tanks in Aya Nagar do not adhere to the guidelines prescribed by the Central Public Health and Environmental Engineering Organization (CPHEEO), and are built as per the discretion of masons and clients. The existing infrastructure does not serve the purpose of treatment of the faecal sludge contained. Many households in the settlement are also connected to unlined septic tanks in order to avoid frequent emptying. Such septic tanks do not contain faecal sludge securely and allow it to seep into the ground.
2. Even though Census figures indicating an increase in the number of toilets would have made better indicators of the spatial temporality, discrepancies in data for the years 1991 and 2001 rendered a decadal comparison ineffective.
3. Adjusted to current inflation rates, the service tariffs would amount to Rs. 1,500-1,900 per trip.
4. The interviews also gathered several other characteristics which could not be listed in the table above. These include regional identity, occupational profile of parents, spouse, siblings, type of schooling of children and source of finance among others.
5. The Aam Aadmi Party (AAP) was the political party heading the Delhi Government at the time of investigation.
6. Although the spatial boundary of the business is speculated to be controlled with the assistance of non-state actors, acknowledgment of such a set-up did not surface in the multiple interviews that were conducted with either the residents, local leaders or service providers.

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ANNEXURE 1: AVERAGE MONTHLY COSTS PER TRUCK

Table 1.1 Monthly costs per truck

Item/variable (Rs.)	Name	Snehpal &									Average cost
		Satbir	Uday Pal	Tej Pal	Vikram	Raghubir	Vinay	Mangal	Baldev	Tek Ram	
Monthly capital cost		11,300	14,000	12,000	12,000			14,000		16,400	13,283
Monthly operational cost	Fuel	30,000	18,000	12,000		18,400		12,000			18,080
	Maintenance	1,000	1,000	1,000		1,000	1,000				1,000
	Labour	10,000	13,000	13,000	10,000	-	-	14,500		12,000	9,063
	Bribes	800	-	-	900	800	-	-	-	-	357
	Disposal fee	1,667	1,667	1,667	1,667	5,827	5,827	1,000		-	2,415

Note: For operators Raghubir and Vinay, the monthly disposal fee varies with seasons. Refer Table 1.2 below for details.

Table 1.2 Disposal fee per trip based on seasons

Month	January	February	March	April	May	June	July	August	September	October	November	December	Average fee
Disposal fee (Rs.)	50	50	50	10	-	-	200	150	100	50	50	50	63

Note: As per information provided by the operators, the disposal fee per trip has been assumed highest during monsoon and lowest during summer.

Table 1.3 Average number of trips covered daily, weekly and monthly per truck

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total
Trips per day	2	3	3	3	3	4	5	23
Trips per month								92

Note: The number of trips covered by operators is lowest in the beginning of the week and highest during weekends. Since most operators informed the number of trips to range between 2-5 per day, for the purpose of calculation it has been assumed to increase in ascending order.

ANNEXURE 2: CAPITAL INVESTMENT AND ANNUAL RETURN ON INVESTMENT PER TRUCK

Table 2.1 Capital investment per truck

Item/variable (Rs.)	Name	Snehpal &									Average cost
		Satbir	Uday Pal	Tej Pal	Vikram	Raghubir	Vinay	Mangal	Baldev	Tek Ram	
Tractor cost		480,000	530,000	550,000	500,000	180,000	500,000	500,000		550,000	515,714
Container cost		175,000	150,000	150,000	150,000	80,000		200,000	65,000	180,000	152,857
Tractor down payment		144,000	159,000	165,000	150,000		150,000	150,000		165,000	154,714

Note: Raghubir's expenditure on infrastructure have not been accounted for in the average as the items were purchased more than a decade ago. The tractor down payment has been assumed as 30% of the retail price.

Table 2.2 Year-wise profit and return on investment per truck

Item/variable (Rs.)	Year			
	Year 1	Year 2	Year 3	Year 4
Container	152,857	-	-	-
Tractor (down payment)	154,714	-	-	-
Annual capital cost *	159,400	159,400	159,400	-
Fuel	216,960	216,960	216,960	216,960
Maintenance	12,000	12,000	12,000	12,000
Labour	108,750	108,750	108,750	108,750
Bribes	4,286	4,286	4,286	4,286
Disposal cost	28,980	28,980	28,980	28,980
Depreciation**	-	66,857	66,857	66,857
Total	837,947	597,233	597,233	437,833
Revenue***	772,800	772,800	772,800	772,800
Profit	(65,147)	175,567	175,567	334,967
Return on investment	-5%	29%	29%	77%

Note: * The loan duration period has been taken as 3 years.

** Assuming the annual rate of depreciation as 10%.

*** Assuming each truck is allotted 92 trips per month at a fee of Rs. 700 per trip (see Annexure 1, Table 1.3).

