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Landlords' and Compound Managers' Role in Improving and Sustaining Shared Latrines in Three Dhaka City Slums

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Received: 28 April 2020; Accepted: 13 July 2020; Published: 21 July 2020



Abstract: (1) Background: Residents of Dhaka slums frequently lack clean and functional shared latrines. We explored the role of landlords and compound managers in promoting latrine cleanliness in the intervention arm of a randomized trial; (2) Methods: We conducted focus group discussions, key informant interviews, and in-depth interviews with community health promoters, landlords, and compound managers to better understand the decision-making process, barriers to contributing to sanitation, and cleanliness of shared latrines. (3) Results: Landlords' and compound managers' engagement in promoting clean and functional latrines depended, in part, on their own proximity to the properties they own and manage. The compound managers played a leadership role through engagement with health promoters, oversight of implementation of a cleaning schedule, and support for installation and maintenance of sanitation hardware, resulting in improved sanitation practices; (4) Conclusions: Interventions in slums in Bangladesh should consider engaging landlords and compound managers in efforts to bring about structural and organizational changes to support the adoption of improved water, sanitation, and hygiene practices.

Keywords: sanitation; water; water, sanitation, and hygiene (WASH); shared latrines; human rights; wastewater treatment; water supply; latrines; landlord; slum

1. Introduction

A total of 14.5 million people reside in Dhaka city, of whom approximately 6 million inhabit urban slums and 4.3 million use communal latrines shared by compounds including multiple households as their primary source of sanitation [1]. The functionality and cleanliness of shared latrines are major challenges. It is difficult to maintain cleanliness of the shared toilets of urban slums [2]. Extremely unclean toilets increase exposure to faecal pathogens [3]. According to the WHO classification, shared toilets are unimproved, based in large part on the difficulties users face in maintaining cleanliness and functionality [4]. Cleanliness is an important factor to users of shared latrines [5,6]. User dissatisfaction often relates to the dirty and malodorous conditions of shared toilets [6], as well as privacy concerns [7].

The risk of diarrhoea and other adverse health outcomes can be significantly higher for shared sanitation compared with individual household latrines [8]. The unclean condition of shared toilet may encourage people to engage in open defecation and the situation is even more difficult for young children, disabled individuals, and menstruating women. Disabled people face both technical and social barriers with shared toilets [9]. Disposing of household solid waste into the latrine pit is common for shared toilets of urban slums and this can block outlet pipes and render the toilets non-functional [10]. Furthermore, shared toilets are not user-friendly for menstruating women and they find it difficult to openly dispose of materials from menstrual management in them [7,10].

Shared latrines are a resource for all people living in an urban housing compound. As they are shared, it is difficult for tenants to take action: (1) Different people in a compound are not related and often do not know each other; (2) High turnover of tenants in many low-income urban neighbourhoods, thus tenants may not feel that they have a long-term interest in improving living conditions in their compound; (3) Tenants may not feel that they have the authority to enforce rules related to shared resources, or otherwise influence the behaviour of others living in the compound; (4) Tenants have limited resources for their living expenses [11]; (5) Tenants lack tenure security and may face the threat of eviction. For these reasons, residents have little incentive to advocate for and invest their own resources to improve or maintain shared sanitation facilities [12,13]. Several studies found an association between tenure security of slum dwellers and housing investment behaviours [14–16]. The compounds with higher risk of eviction used fewer permanent materials in constructing sanitation facilities [15]. This risk of eviction affects the voluntary capacity for tenants to adopt behaviour change recommendations promoted by governments and non-governmental organizations [17].

Many studies describe challenges faced by residents of urban slums due to structural barriers and power imbalances, including lack of support or abusive behaviour by landlords and compound managers [18–23]. Few studies discuss the potential role of landlords and compound managers in fostering better sanitation conditions [24]. One study has evaluated the multifaceted and far-reaching role that landlords have by evaluating their role in negotiating slum operations, settling disputes within compounds, and mediating conflicts among residents [25]. Compound managers are appointed or hired by landlords. They both negotiate with leaders and power brokers to gain access to services for the houses that they own or manage and grant access and enforce rules for the tenants who pay rent for these same houses. Landlords or compound managers have considerable power and authority in urban slums and have the potential to play a constructive role in improving the condition of shared toilets [26].

Some landlords do not invest in repairing existing latrines or installing new latrines, reasoning that their primary interests lie in maximizing the number of rooms to rent. Some landlords view the space that could be used to install latrines as potential space to set up more rooms to rent out [27]. Others express desires to improve sanitation conditions but lack the financial means to do so due to competing needs within the compound [7]. It is problematic to consider landlords and compound managers as the guarantor of sanitation rights when they themselves frequently do not have legal title to the land, authorization to construct residences, and connection with municipal systems.

The aim of the present study was to explore the role of the landlords and compound managers to ensure sanitation facilities in urban slums of Dhaka, Bangladesh. We report on engagement of landlords and compound managers in an intervention to improve the cleanliness of shared latrines in these areas.

2. Materials and Methods

The results of the intervention trial to promote shared latrine cleanliness, operations, and maintenance in Dhaka slums is reported elsewhere [7]. Behaviour change materials and interpersonal communication with slum residents, landlords, and compound managers and those who emptied waste bins comprised a suite of interventions intended to improve flushing, latrine waste disposal in waste bins, and safe child faeces disposal [28]. These methods of utilizing behaviour change materials through the provision of

water and sanitation hardware such as waste bins have proved effective in reducing open defecation by young children and are commonly utilized [10,29–31]. Many residents were accustomed to disposing of household solid waste including diapers and plastic bags into the latrines [10]. Conditions improved after distributing the intervention materials to compounds, including waste bins and 70 L and 4 L water buckets in the intervention arm (the arm selected for implementing the intervention). Compound managers helped to place the intervention materials at the right place for the tenants of the compounds. The water reservoir bucket was perceived as a good latrine cleaning system, especially during water shortages. The 4 L bucket helped tenants flush after defecation and community promoters further developed communication materials to discourage waste disposal in latrines and promote the use of waste bins [10].

The current study aimed to explore in detail the mechanisms by which landlords and compound managers contributed to intervention uptake. Details of the study design and interventions have been published elsewhere [7,10]. In summary, we conducted 12 in-depth-interviews with landlords during the pre-intervention period to learn about the role of the landlord and compound manager within the compound. Nine focus group discussions were conducted with community health promoters, landlords, compound managers, and tenants from the intervention slums. Two focus group discussions were conducted with community health promoters' supervisors and two key informant interviews with the implementing agency staff. All interviews and focus group discussions were conducted to learn about the role of landlords and compound managers in the intervention. We conducted 12 in-depth-interviews with landlords post-intervention to determine their role in the intervention. A summary of data collection for pre-intervention, during the intervention, and post-intervention is displayed in Table 1. We identified factors that affected communal latrine cleanliness, functionality, and maintenance and developed an intervention to remediate these factors. We structured our qualitative interview guides to determine actions to be taken and the factors to be considered when developing our interventions. This study evaluated how landlords could further improve and sustain communal latrine use and maintenance in a low-income slum community in Dhaka, Bangladesh.

Table 1. A summary of data collection for pre-intervention, during the intervention, and post-intervention.

Pre-Intervention		
Methods	Respondents	Objectives
Twelve in-depth interviews	Landlords	To learn about the role of the landlords and compound managers within the compound
During the Intervention		
Methods	Respondents	Objectives
Nine focus group discussions	Community health promoters, landlords, compound managers, and tenants	To learn about the role of landlords and compound managers in the intervention
Two focus group discussions	Community health promoters' supervisors	To learn about the role of landlords and compound managers in the intervention
Post-Intervention		
Methods	Respondents	Objectives
Twelve in-depth-interviews	Landlords	To determine their role in the intervention

The research officers, who were native Bengali speakers with extensive qualitative research experience, recorded sessions using audio recorder devices and took hand-written notes during the interviews and focus group discussions. After data collection, audio data from both the in-depth interviews and focus group discussions were transcribed verbatim in Bengali, then translated into English in Microsoft Word. The translators were strictly instructed to transliterate portions of the interviews that contained local terms and expressions. The research team's additional field notes

included informal discussions and observations. The team noted the tone and attitudes of the respondents during data collection.

Codes were developed based on themes chosen prior to data collection according to the study objectives. We generated additional inductive codes from the data. Individual and group interview transcripts were then manually coded and categorized according to these major codes. The interviews were coded and categorized individually, but the research team drew inferences from the findings collectively.

In this paper, we present detailed information on 3 of the 12 interviews conducted post-intervention. These cases were selected to demonstrate in detail the process, motivations, barriers, and facilitators for acceptance and implementation of the intervention to promote latrine cleanliness in Dhaka slums. The data from these three compounds reflects the major themes identified in the analysis of all the qualitative data. A summary table of the selection criteria for the data from the three compounds is listed in Table 2.

Table 2. Criteria for selecting three compounds as case studies.

Criteria	Purpose
Three specific geographical areas selected in Dhaka City	To select geographical regions that were representative of the slum regions in Dhaka city and that contain a representative number of residents within the city.
Include both landlord and compound managers in each case study	To explore the roles of both landlord and compound managers—their similarities and differences.
Include both male and female landlords and/or compound managers in each case study	Both females and males were influential in behaviour change intervention within the compound and including both genders would allow for better exploration of differences in roles by gender.

Ethical Consideration

We obtained written informed consent from the study participants. The study protocol was reviewed and approved by the ethical review committee of icddr,b and institutional review board of Stanford University.

3. Results

The literature draws a distinction between compound managers—who often live in or near the compounds that they manage—from landlords—who live farther away and employ compound managers as an interim landlord or as their representatives [29]. However, for the three compounds described below, the compound managers or landlords did not fit neatly within these categories. In two cases, the landlords lived within the compound, while in another case, a compound manager lived in the compound, while the landlord also lived nearby. Due to the proximity of residence by both the landlord and compound manager in all three compounds described, their roles and responsibilities often overlapped [30], as indicated in Table 3. In the larger study, we observed that landlords and compound managers who lived in the compounds (managed and shared the same shared latrine facility with other residents) were more receptive to health promoter suggestions on best sanitation practices and took a more active role in the oversight of latrine maintenance, either cleaning themselves or enforcing a schedule of shared responsibility for maintenance chores [10].

Table 3. Comparison between the role of the landlord and compound manager after implementation of the latrine cleanliness intervention in three slum communities in Dhaka: Mohakhali, Mohammadpur, Mirpur.

Comparison Based on a Specific Role	Landlord	Compound Manager
Decision making authority	Landlords may choose to live in the compound (but are not required to). Decision-making, provision of logistics, hardware, or any kind of structural changes belongs to him or her (case study 1,2,3).	The compound manager is assigned by the landlord and is paid a monthly salary to look after the tenants of the compound. Compound managers normally live with other tenants and share the same compound. The compound manager does not have the highest authority to make critical decisions on larger issues such as structural changes, repairs, renovation, logistics supply, or selecting new tenants to live in the compound, but compound manager can make decisions on small issues like setting a latrine-cleaning schedule and how to inform new tenants of compound rules (case study 1,2,3).
Key decision maker	The landlord owns the compound and holds all power on purchasing decisions (i.e., he/she can buy bulbs, buckets, baskets, and electric motors if necessary) (case study 1,2,3).	The compound manager does not own anything in the compound, unless he/she personally purchases an item. The compound manager does not make any final decisions (i.e., he/she cannot even buy a light bulb without permission from his/her landlord). He/she is responsible for the implementation of regulations set in place by the landlord (case study 1,2,3).
Responsibility to deal with the tenants	The landlord is responsible for looking after the compound but may not directly interact with tenants as most complaints and feedback come from the compound manager (case study 1,2,3).	He/she is assigned for duties and responsibilities like enforcing schedules and regulations related to latrine cleaning, collecting rent, water, gas, and electricity bills (case study 1,2,3).
Responsibility for creating a cleaning system and schedule	The landlord who lives at the same compound where other tenants live plays a proactive role for latrine cleaning, creates systems to remind tenants to practice safe water practices after defecation activities, and maintains the deadline of cleaning dates (case study 1,2,3).	The compound manager creates a system for cleaning and reminds tenants to clean their latrines by the scheduled date (case study 1,2,3).
Responsible person for maintaining infrastructure	The landlord is responsible for the structural construction such as latrine construction, faecal sludge management, repair of latrine etc. (case study 1,2,3).	The Compound manager informs the landlords of any anomalies within the compound. He/she is also responsible for keeping latrines clean and provide a schedule for latrine cleaning and management of faecal sludge (case study 1,2,3).
Responsibility regarding latrine cleaning	If the landlord lives in the same compound with other tenants and in the case where tenants are unable to clean the latrine due to their busy schedules or they are unwilling to clean, he/she will clean the latrine proactively (case study 1,2).	If the compound manager lives in the same compound as his/her tenants, he/she will carry out related tasks of cleaning the latrine, storing water, and arranging lighting. He/she is also responsible to remind tenants who do not pour adequate water after defecation and urination (case study 1,2).

Table 3. Cont.

Comparison Based on a Specific Role	Landlord	Compound Manager
Reinforcing role for implementing the intervention	The landlord sometimes told mothers that children cannot mess up the latrine. If any children cause a mess in the latrine, then their respective mother had to clean the latrine (case study 1).	The compound manager also told mothers that children cannot mess up the latrine. If any child messed up the latrine, then the respective mother had to clean the latrine (case study 1,2,3).
Played the role as a promoter	The landlord told other tenants to attend the meeting with the promoters and the landlord also attended the meeting with them. If any member could not attend, then the landlord delivers the messages to those tenants. If tenants forgot/were unable to refill the reservoir bucket, then the landlord refilled the water bucket (case study 1,2).	Compound managers told other tenants to attend the meeting with the promoters and they also attended the meeting with them. If any member can not attend, then they deliver the messages to those tenants. If tenants forget/are unable to refill the reservoir bucket, then the compound manager refills the water bucket (case study 1,2).

Health promoters reported that landlords and compound managers played an essential role in promoting interventions in compounds. Promoters stated that they could not have successfully promoted the intervention if landlords were not supportive in enabling them to reach the tenants and carry out activities in the compounds that they own. Landlords and compound managers encouraged and facilitated tenant participation in compound intervention meetings, motivated tenants to practice recommended behaviours, and informed community health promoters when residents were reluctant to use new water storage reservoirs and waste bin hardware. The opposite occurred where the landlords were not motivated or were resistant to promoters entering their compounds, resulting in low intervention uptake due to refusal to participate by household members. A female tenant said in a focus group discussion:

In this compound, our compound manager is not well motivated even she is not encouraging us to use the hardware, follow the recommended behavior as provided by you. She has no time and less likely interest to encourage tenants in our compound, so how compound members follow and maintain the recommended behavior by using the hardware.

Landlords and compound managers saw their role as vital for hardware maintenance. They either maintained the hardware themselves or assigned tenants on a rotating schedule to clean and maintain the hardware. Health promoters and their supervisors reported that landlords and compound managers monitored latrine cleanliness and functionality most actively when they lived in the same compound—if using the same latrine as their tenants, it was easier to frequently assess the cleanliness of the latrine. The female landlords and compound managers who were consistently present in the compounds encouraged tenants to clean latrines and refill water reservoirs. According to the tenants, some landlords participated in the intervention by disposing of waste from study-provided bins into waste collector vans on behalf of tenants when they were not present.

Landlords and compound managers also played an important leadership role in creating a supportive environment for optimal intervention uptake. Promoters and their supervisors reported that landlords were actively engaged in intervention delivery by motivating tenants to follow the behaviour change recommendations and oriented new tenants on intervention messages. Sometimes landlords described the behaviour change recommendations to tenants who missed community promoter-led sessions. Key informants from the implementation agency reported that when they encountered problems related to promoting new hardware and behaviours among the compound households, landlords and compound managers sometimes applied their proprietorship as the

landowner to facilitate intervention adoption among tenants. Based on 12 interviews conducted with the landlord and compound managers, tenants obeyed the instruction when it came from the landlord and compound managers—if landlords instructed tenants to clean latrines and avoid throwing waste into the latrine bowl, tenants followed their instructions.

Data from the three compounds presented below describe the motivations of landlords, financial factors (charging tenants more if the compound and its latrines are in better condition), and contextual factors experienced in implementing and sustaining sanitation facilities for the intervention. A summary of tenant expenditure, numbers of latrines, residents, and compounds in each slum is listed in Table 4.

Table 4. Expenditure of tenants and description of conditions of each of the three slums.

Compound	Per Room Expenditure Paid by Tenants	Number of Latrines	Number of Households in Compound	Number of Compounds and Rooms	Landlord and Compound Manager
Compound #1: Korail Slum, Mohakhali	2000 BDT (24 USD) (includes gas, electricity, and water)	n = 1 latrine with all hardware included (a. waste bins with lids, b. 4 L bucket for flushing, c. 70 L water storage reservoir, d. signs indicating expected behaviours)	n = 7 households (21 family members)	2 compounds (10 rooms)	One female landlord—lived in the same compound
Compound #2: Rayerbazar Slum, Mohammadpur	2000–2200 BDT (24–26 USD) (includes gas, electricity, and water)	n = 1 latrine with all hardware included	n = 6 households (18 total family members)	1 compound (12 rooms)	One female compound manager—lived in the same compound
Compound #3: Kalshi Slum, Mirpur	1200–1500 BDT (14–18 USD) Includes gas and water Additional 1400 BDT (17 USD) for electricity	n = 1 latrine facility—flush latrine only with limited hardware	n households unknown (22 family members)	1 compound (10 rooms)	One male landlord—lived outside of the compound

3.1. Compound #1: Korail Slum, Mohakhali

The Government of Bangladesh holds legal title to a large portion of the Korail slum. However, local powerbrokers illegally rent out several unoccupied plots of land within the slum to low-income populations [32]. Many properties within the Korail slum have now been purchased by previous landlords and have limited to no connection to municipal water and sanitation systems compared to nearby communities [32,33]. Two compounds (10 rooms) in the slum were purchased by the landowner in which 10 families with a total of 21 members resided. The landlord paid 7000 BDT (almost 83 USD) to build one latrine with two cubicles made of cement and brick, which was shared by all tenants.

Some of the compounds in the Korail slum had electric motors connected to the water tank to maintain a reservoir of water supplied by the local water utility (WASA). Although all slums had intermittent water supply provided through the local utility, the landlord within this compound arranged a water pipe connected with an electric motor to provide a steady supply of water. Water was previously collected from a local water vendor for 1100 BDT (14 USD/month), but with the newly installed water pipe connected with a reservoir tank of water line from the utility, the cost of water was reduced to 300–400 BDT (4–5 USD/month). The landlord said in an interview:

I made water available throughout the day and arranged continued access to a designated water reservoir so that tenants have adequate water after latrine use and when taking a bath. I also bought a [water pump] for 2 compounds.

Despite the landlords' attempts to provide cleaning supplies, most of the tenants still considered it the landlord's responsibility to clean the latrine and refused to clean it themselves. Prior to the intervention, male residents in particular used to refuse to clean latrines and exacerbated the poor conditions by dropping used tissues and used condoms into the latrine, clogging the pipes, resulting in an overflow and flooding of faeces. Mothers took care in ensuring that their children did not dirty the latrine by utilizing buckets to clean the latrines. Additionally, prior to providing buckets, women would throw their waste menstrual rags into the latrine, which normally took place at night so others would not see, which further blocked the latrines. After buckets were provided, menstruating women had more incentive to clean and dispose of the contents in waste buckets when they filled up as they did not want men to see their menstrual rags.

To further improve the condition of the latrine, the landlord created a cleaning schedule for each household which rotated on a fixed schedule, depending on the current number of households in each compound. She instructed different households to clean the latrine on a specific day, but most had no desire, especially those who worked at the garment factories as they had no free time to clean the latrine, which often resulted in a negative exchange between the landlord and tenant. The landlord and her daughter-in-law often ended up cleaning the latrine and would also insert a stick into the pipe as blockages were the primary latrine-related issue in the compound.

3.2. Compound #2: Rayerbazar Slum, Mohammadpur

The Rayerbazar slum was built over a low-lying area surrounded by stagnant water. The slum has been a site for the evaluation of health effects from the detrimental water supply and sanitation facilities [34]. A compound manager living in the Rayerbazar slum in the Mohammadpur area oversaw 12 rooms in which 6 families resided. The compound was built on relatively low ground, resulting in latrines filling with water during the rainy season, rendering them unusable during that time of year. As such, the intervention was not helpful during the rainy season as the latrines were rendered unusable. However, latrines only overflowed for short periods of time within the compound. Only a single latrine was available for the six families, with a total of 18 members residing in the compound. The compound manager handled sanitation issues involving latrine cleanliness and ensured that buckets were provided to tenants and emptied these among other tasks. She often told tenants to fulfil their cleaning responsibilities, such as reminding male tenants not to dispose of personal waste into the latrine and reminding male members of the compound to flush even after urination.

Tenants were instructed to use these buckets for disposing of rags and waste to prevent latrine and drain blockages. She also charged a small fee so that she could hire a waste collector for the compound, which reduced blockages and reduced waste from being thrown into the latrine. She emphasized the significance of the cleaning system by strictly informing existing and new tenants of latrine cleaning procedures. Tenants were told to, *"keep the latrine clean otherwise leave the compound."* Although tenants living with other family members cleaned the latrine regularly, most bachelors did not as they considered it to be women's work. Male tenants would often dirty the latrine during and after urinating, generating bad odours. The compound manager arranged for these males to meet with a community promoter to learn about best latrine cleaning practices and found that there were no more immediate incidents of latrine blockages and odours.

She made tenants aware about her own approach towards sanitation practices by stating that "It is better to keep rooms vacant than renting to a tenant who does not sweep the floor." She emphasized that "disposing waste into right place and keeping latrine clean" was a family task. When tasked with cleaning the latrine herself, as she had been living in a compound where she used a shared latrine with the rest of the compound, she personally did not think of cleaning the latrine as a burden and considered it as routine household work. She was also personally motivated to clean the latrine as

it reduced the chances of contracting diseases and strived to protect the children who were most susceptible to illness.

3.3. Compound #3: Kalshi Slum, Mirpur

The north Kalshi slum in the Mirpur area was originally owned by the Defense Officers Housing Society, a cooperative housing society for retired army officers, and was later sold to the current landowner. In 2004, the landowner built another compound beside Uttar Kalshi School and moved his family to that compound. The landlord owned 10 rooms within the compound.

Only one latrine with two cubicles (one for male tenants and one for female tenants) was available, shared by 22 residents. This latrine was built four years earlier and the total expense for its construction was relatively high, 100,000 BDT (1180 USD), as it included a septic tank, which is rarely included in slum latrines. During the time of interview, the septic tank had not yet filled and had not been emptied since its construction. The landlord estimated that the cost of removing the faecal sludge would cost 1200 BDT (14 USD), which he reported hindered him from spending money to empty the septic tank. The landlord had no information on what age group or sex was contributing to the unsanitary conditions of the latrine and he had not visited the latrine in the last 6 months. However, he assured that he was strict in maintaining the cleanliness of the latrine, enforced by his wife, who established a regular cleaning schedule with the tenants.

Although buckets were provided next to latrines for tenants to flush after latrine use, the landlord could not remember the size of the buckets. To keep the compound clean and to emphasize it as a collective responsibility by all tenants, the landlord initially provided tools and chemicals to clean the latrine such as bleach powder and a brush. However, at the time of interview, these items were no longer provided as they were taken by the tenants when they moved to another compound. Current tenants consequently had to purchase these supplies themselves.

The landlord instead focused on ensuring a stable source of water for his tenants as he considered provision of water, gas, and electricity as essential. Most of the landlord's previous resources and time went into securing a water source as he viewed the provision of water as a necessity and anticipated complaints from tenants if a secure water source was not provided. As there was now a stable water storage, the landlord arranged for maintenance of the 70 L water storage reservoir and 4 L bucket for flushing provided by the study, which incentivized the landlord to implement a cleaning system [7,10]. He involved the tenants in the placement decision of the signage via illustrations to ensure better uptake. Tenants were instructed to use the 70 L water storage reservoir for bathing and water from the 4 L bucket for flushing after defecation [7,10].

Other themes that emerged from the interviews were that the temporary nature of the slums played a role in the behaviour of the landlord and compound manager and that better sanitation services were of little priority to the tenants, landlords, and compound managers as they had to focus on more immediate needs such as accessibility of clean water and affordable shelter [35].

4. Discussion

Our experiences in intervention implementation in three compounds illustrate variation in the roles and responsibilities that landlords and compound managers take on in slums from three areas of Dhaka city in Bangladesh. Landlords may be more motivated to improve and invest in sanitation facilities when it involves a financial benefit to them, such as generating a higher income and a higher return on investment [7]. However, if they share the latrine with residents in the compound, they can be motivated to monitor cleanliness and take a personal interest in sanitation practices. Our intervention was attractive to landlords and compound managers. They appreciated its value as it improved the appearance and functionality of their property. Landlords in some instances took the initiative to upgrade the facilities in their compounds. The landlord of one compound in Kalshi slum, Mirpur estimated that by installing a septic tank, he could avoid subsequent expenses for emptying faecal sludge from pit latrines. They may have also come to view this as a way of protecting their investment.

In the Korail slum, the landlord arranged to connect a water pipe with an electric motor to provide an uninterrupted supply of water, which is arguably an unintended outcome of the intervention.

In the first two examples, tenants, landlords, and compound managers agreed that upgrading and maintenance of sanitation facilities, water supply, gas, and electricity in the compounds were all within the purview of the landlord and compound manager. However, most landlords lack incentives and a legal framework that holds them accountable to provide these basic needs [35]. Landlords and compound managers often fail to provide adequate sanitation facilities and maintenance in the absence of necessary incentives and government or institutional support [35]. There is evidence that in the absence of government or institutional support, community health promoters have a role in Dhaka and in other settings, mobilizing community members to improve and maintain facilities and promote related behaviours [7,36].

Findings from the third compound case study in the Mirpur slum suggest that water, sanitation, and hygiene (WASH) programs should consider creating a monitoring system for latrine cleanliness to sustain positive sanitation behavioural practices, especially for landlords who reside within the compound. Landlords/compound managers would benefit from guidance on how to motivate tenants to participate in cleaning and develop and maintain an appropriate monitoring system. A study in Lusaka, Zambia found that even with an established cleaning schedule in place, lack of a monitoring system and consequences for non-compliance led to continued unsanitary practices within a compound [19]. After the provision of hardware, the landlord and compound manager must ensure that these items are easily accessible to tenants (buckets are next to the latrines or outside latrine doors). They must also observe who is utilizing the hardware, which groups are still exhibiting negative behavioural practices, and enforce consequences for non-compliance. These recommendations may not be ideal for landlords who do not live within the compounds as they do not experience the consequences of their lack of input and oversight. However, in such cases, we observed that some compound managers assumed this role and voluntarily engaged in monitoring of toilet cleanliness.

A significant limitation of this study is that much of the information presented was based on the interview with the landlords and compound managers and we did not confirm all of the findings with the tenants. They may have presented the situation in ways that are favourable to them to bolster their images as responsible landlords and compound managers. The other limitation is that we did not have complete observational data to verify and complement data from the interviews. We conducted focus group discussions where the tenants and the landlords or compound managers participated jointly, however we did not conduct in-depth interviews with tenants separately to ask them about the role of landlords or compound managers. Under such conditions, the tenants may have felt compelled to present the role of the landlords in a positive way.

5. Conclusions

The landlords and compound managers played a pivotal role to provide a supportive environment and to ensure sanitation facilities were maintained by influencing residents within their compounds. WASH programs should consider incentives for landlords and compound managers to improve and support adequate sanitation, acknowledging the limited ability for household members to affect change on their own. Effective engagement of this group in future WASH programs can reduce barriers to promoting interventions and thereby facilitate uptake. To promote improved cleanliness, WASH programs in urban slums should include landlords and compound managers and find ways to foster productive leadership roles for them.

Author Contributions: F.Y. supervised the data collection, analysed and summarized the data, and developed the data collection instruments. F.Y. drafted the original manuscript. S.T.H. participated sufficiently in the work of analysis for appropriate portions of the content and revised the manuscript critically. M.R. revised the manuscript critically for important intellectual content. F.B. revised the manuscript critically for important intellectual content. R.E.S. participated sufficiently in the work of analysis for appropriate portions of the content. F.A.N. had substantive intellectual contributions to the conception and design of this study. M.-U.A. revised the manuscript critically for important intellectual content. M.K.H., J.B.D., and D.Y. were involved in data collection

and made contributions in acquisition of data and were also involved in analysis and interpretation. L.U., S.P.L., and P.J.W. made substantive intellectual contributions to the conception and design of this study. They were also involved in drafting the manuscript and revised it critically for important intellectual content. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by Water Sanitation for Urban Poor (WSUP) through Stanford University, grant no GR-01175.

Acknowledgments: icddr,b is grateful to the Governments of Bangladesh, Canada, Sweden, and the UK for providing core/unrestricted support. We are grateful to Water, Sanitation for Urban Poor (WSUP) for funding this project. We thank all anthropologists who collected and processed data. Finally, we would like to thank the residents of the community who gave their time.

Conflicts of Interest: The authors declare that they have no competing interests.

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