# Comparative Study on best WASH practices in the LIC areas of Dhaka



Prepared By

LightCastle Partners

Partners

ওয়াসা

WOP WATER OPERATORS PARTNERSHIP

VEI Dutch Water Operators

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***From the Authors:***

- **Zahedul Amin**, Director, Strategy, Finance & Consulting Services, LightCastle Partners
- **Saif Nazrul**, Project Manager and Senior Business Consultant, LightCastle Partners
- **Dipa Sultana**, Business Consultant, LightCastle Partners

# List of Abbreviations and Acronyms

| | | |
|---|---|---|
| ADB | - | Asian Development Bank |
| AFD | - | Agence Française de Développement |
| ATM | - | Automated Teller Machine |
| BCC | - | Behavior Change Communication |
| BDT | - | Bangladesh Taka |
| CAPEX | - | Capital Expenditure |
| CBO | - | Community Based Organization |
| CPCR | - | Community Program and Consumer Relation Division under DWASA |
| DFID | - | Department for International Development (UK) |
| DMA | - | District Metered Area |
| DSK | - | Dustha Shahthya Kendra (an NGO) |
| DTW | - | Deep Tube Well |
| DWASA | - | Dhaka Water Supply and Sewerage Authority |
| DWSS | - | Drinking Water Supply and Sanitation |
| EKN | - | Embassy of the Kingdom of the Netherland to the People's Republic of Bangladesh |
| ETP | - | Effluent (wastewater) Treatment Plant |
| LIC | - | Low Income Community |
| MoA | - | Memorandum of Agreement |
| MoU | - | Memorandum of Understanding |
| MODS | - | Management, Operation, Development System |
| NGO | - | Non-Governmental Organization |
| NRW | - | Non-Revenue Water |
| O&M | - | Operation and Maintenance |
| OPEX | - | Operational Expenditure |
| UNICEF | - | United Nations Children’s Fund |
| USAID | - | United States Agency for International Development |
| VEI | - | Vitens Evides International |
| WASH | - | Water, Sanitation and Hygiene |
| Wfl | - | Water for Life |
| WOP | - | Water Operators Partnership |
| WSUP | - | Water & Sanitation for the Urban Poor |

# Glossary

**Bulk Water Meter:** Bulk water meters are attached to pipes supplying large quantities of water to measure the water flow. It is not used for individual households.

**CBO:** Community based organizations (CBOs) are nonprofit groups that work at a local level to improve life for residents of the community. The CBO model is characterized by the involvement of a Community Based Organization (CBO) that manages and operates the WASH facilities on behalf of the community.

**CPCR:** The Community Program and Consumer Relation (CPCR) is a division set up under the DWASA with the initiative to provide the entire LIC population of Dhaka with legal water services.

**DMA:** District metered areas are small clusters of water users with a provision to individually monitor the water supplied and consumed. DMAs in Dhaka city fall under the jurisdiction of DWASA.

**DWASA:** DWASA is the only water utility service provider in Dhaka city. DWASA Network refers to the water transmission and distribution network maintained by DWASA.

**Elevated Storage Tanks:** Elevated water storage tanks are used to store water within a designated area or community. Elevated tanks, which are located above ground level allow the natural force of gravity to produce consistent water pressure throughout the system.

**Hand pump:** Hand pumps are water-lifting devices that can be operated manually to withdraw water from surface water sources, groundwater sources and reservoirs, or to pump water into distribution systems.

**Household Connections:** Household Connections refer to water networks that extend to the individual household level as opposed to a shared community water point. Household connections can have either a hand pump or tap for water dispensation.

**LIC area:** LIC areas generally refer to low-income community areas in Dhaka city, typically including shanties and slums.

**LIC Network**: Piped water supply network formed within an LIC area.

**Line:** Line refers to the piped water connection brought in from DWASA to the LICs and then attached to the either the LIC network or water point(s).

**Meter Clusters:** Cluster consisting of multiple household meters located in a specific zone or area.

**MODS Zone:** MODS zone refers to Management, Operation, Development System of a specific zone/area, which is a method of zonal segregation used by DWASA. There are 10 MODS Zones in Dhaka city.

**Non-LIC area**: A non-LIC area refers to an area housing predominantly non-LIC populations, typically middle-income and high-income households.

**Pressurized Network:** Pressurized piped network of WOP2 is integrated with the DWASA's DMA network, which ensures high-pressure water supply to the LIC.

**Progressive Tariff:** A progressive tariff is based on the subscriber's ability to pay. In the context of water supply provision, it would mean imposing a lower tariff rate on low-income individuals or householders than on those with a higher income.

**Standpost:** A standpost is a free-standing form of water point which does not have any supporting reservoirs or storage facility. The water dispensing mechanism at a standpost could be in the form of a tap or hand pump in Dhaka city.

**Tap:** A faucet from which water is drawn.

**Tube Well:** A tube well is a type of water well in which a long, wide, stainless steel tube or pipe is bored into an underground aquifer. A pump lifts water for dispensing through a water point or to a water network. The required depth of the well depends on the depth of the water table.

**Underground Storage Tank:** Underground water storage tanks are used for underground storage of potable drinking water, water for regular usage, wastewater, and/or rainwater collection.

**Water ATM:** Water ATMs are automated water dispensing units. When dispensing water, the machines calculates the charges based on customer requirement.

**Water Point**: Specific establishment under the water network that provides/supplies water to the individuals and/or households. A water point could be a tap, standpost, hand pump, production tube well, etc. Typically, water points are shared by several households or members of a community.

# Executive Summary

This executive summary mirrors the structure of the report; first laying out a short background and rationale behind this comparative study and the methodology adopted to undertake the study, then proceeding to the presentation of major quantitative and qualitative findings in terms of performance and risk evaluations across different WASH models. The executive summary then concludes with a list of specific recommendations aimed at various WASH sector stakeholders, who are intended to be the audience of this report.

To date, nearly 700,000 slum dwellers in 435 LIC areas of Dhaka city are served from the DWASA networks through legal water connections. DWASA should be commended for taking the initiative to provide the entire LIC population of Dhaka with legal water services and for setting up a dedicated CPCR Unit to ensure its realization in partnership with other sector stakeholders. Realizing full coverage undoubtedly remains a considerable challenge, however, as Dhaka is reported to have about 4 million slum dwellers spread over 5,000 LICs[1]. Recognizing the importance of selecting an optimal WASH service delivery model to reach unserved populations and to optimize existing projects, and considering the dearth of a comprehensive comparative research that investigated the feasibility and sustainability of WASH looking at the variety of WASH Services Delivery models for LICs that are being used in Dhaka city, this study was commissioned to LightCastle Partners (LCP) by the DWASA-VEI Water Operators Partnership (WOP2).

With the objective to identify the relative strengths and weaknesses of various operational WASH service delivery models in Dhaka, this study has adopted a mixed-methods research approach in order to map existing service delivery models, consult stakeholders, analyze model performance and make recommendations to WASH sector stakeholders in the form of this report. In the initial stages of this study, a literature review was conducted and preliminary short discussions held with numerous sector stakeholders to develop a sector landscape from which a shortlist of different WASH service delivery models in use across Dhaka city was derived. The identified WASH service delivery models were consciously classified along two dimensions: technology being the first dimension and operational structure the second. Across the operational structure dimension, water service delivery models in Dhaka LICs can be divided into the non-profit and commercials models, while the choice of technology varied between community-level connections both with and without storage, household-level connections (with storage) and water ATMs/vending machines. Classification along these dual dimensions led to identification of the 7 major models as follows:

*Table 1 WASH Service Delivery Models in the LICs of Dhaka*

| | **OPERATIONAL STRUCTURE** | | **Abbreviations:** |
|---|---|---|---|
| **TECHNOLOGY** | **Non-commercial (CBO/non-profit)** | **Commercial or for-profit** | |
| **Water Points without Storage** | • **WOP1-NS**<br>• **WOP2-NS**<br>• **CBO-NS** | | S = Storage<br>NS = No Storage<br>ATM = Automated Teller Machines/ Water Vending Machines<br>SE = Social Enterprise<br>C = Commercial<br>NC = Non-Commercial<br>WOP1 = 1st phase of WOP project<br>WOP2 = 2nd phase of WOP project |
| **Water Points with Storage** | • **CBO-S** | • **SE** | |
| **ATMs or Water Vending Machines** | • **ATM-NC** | • **ATM-C*** | |

* ***Note:*** *Although the ATM-C model is meant for use by low-income households, it is not exclusively meant for use by LIC residents and its booths are not located within any LICs. Hence, the performance evaluation indicators used for assessment in this study were, in many cases, not directly applicable to the ATM-C model, since the evaluation criteria were biased towards performance in an LIC-based context. Readers should be aware that ATM-C model was included with*

[1] Source: UNICEF, 2015, Analysis of the Situation of Children and Women in Bangladesh 2015

*the specific understanding that its performance would not be held to the same standards as the other LIC-based water service delivery models evaluated under this study.*

Among the non-profit models, the Community-Based Organization-led (CBO) models, with several technology variations, are most widely used. The WOP and ATM-C models are also CBO models, albeit with their own unique characteristics. CBO-led models are characterized by the high level of involvement of a selection of the community members in the day-to-day operationalization of the model, usually through an unremunerated role. The CBO-led model also seeks to involve the community members in the planning, design & construction and decision-making stages of a project. The CBO-led models assume that CBOs will have their communities' interest at heart and will therefore opt for decisions that make financial and operational sense, rather than being driven by a profit motive. Commercial models included the Social Enterprise (SE) model that offered household-level connections, and the commercial Water ATM (ATM-C) model. It was found that the CPCR unit of DWASA, dedicated to water supply provision to LICs, has a clear preference for the CBO-led models and envisions it as the long-term solution to formalize water service delivery to LICs.

Interviews of the major operators of each of the identified models were then conducted and lists of potential sites sought, from which the 7 sites deemed as the best example of each model, keeping in consideration population size, were selected for evaluation. The map below shows the geographical dispersion of the 7 sites across Dhaka city:

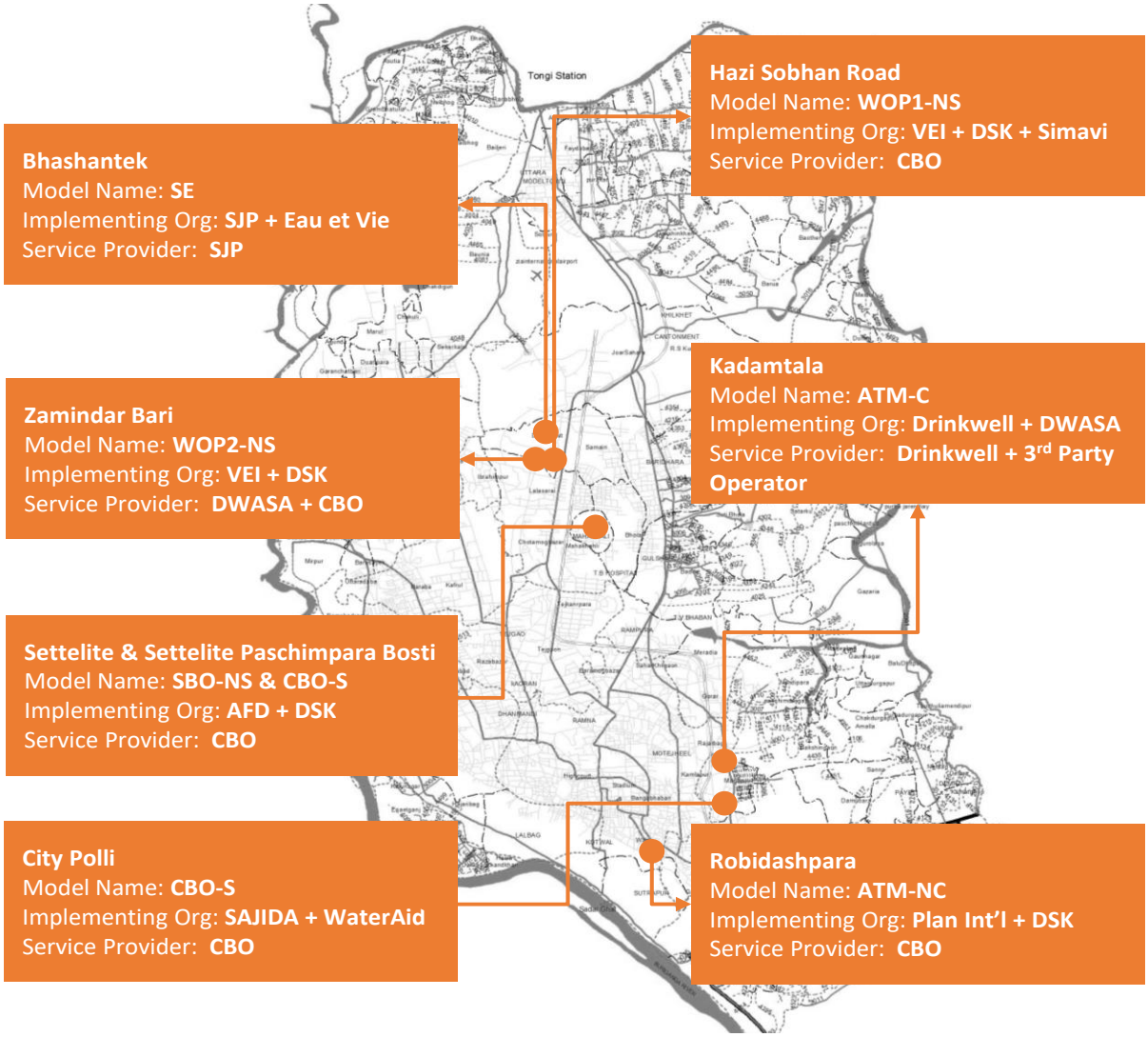



*Figure 1 Location of LIC sites investigated across Dhaka city*

The project made use of a mixed-methods approach utilizing both quantitative and qualitative modes of investigation to collect primary data from the 7 locations. In the course of research, LIC residents were surveyed and interviewed, whilst Key Informant Interviews were conducted with local operators/CBOs, community leaders within LICs. Outside of LICs, representatives from development partners and NGOs relating to the selected sites and Dhaka Water Supply and Sewerage Authority (DWASA) were interviewed.

## Summary of Findings

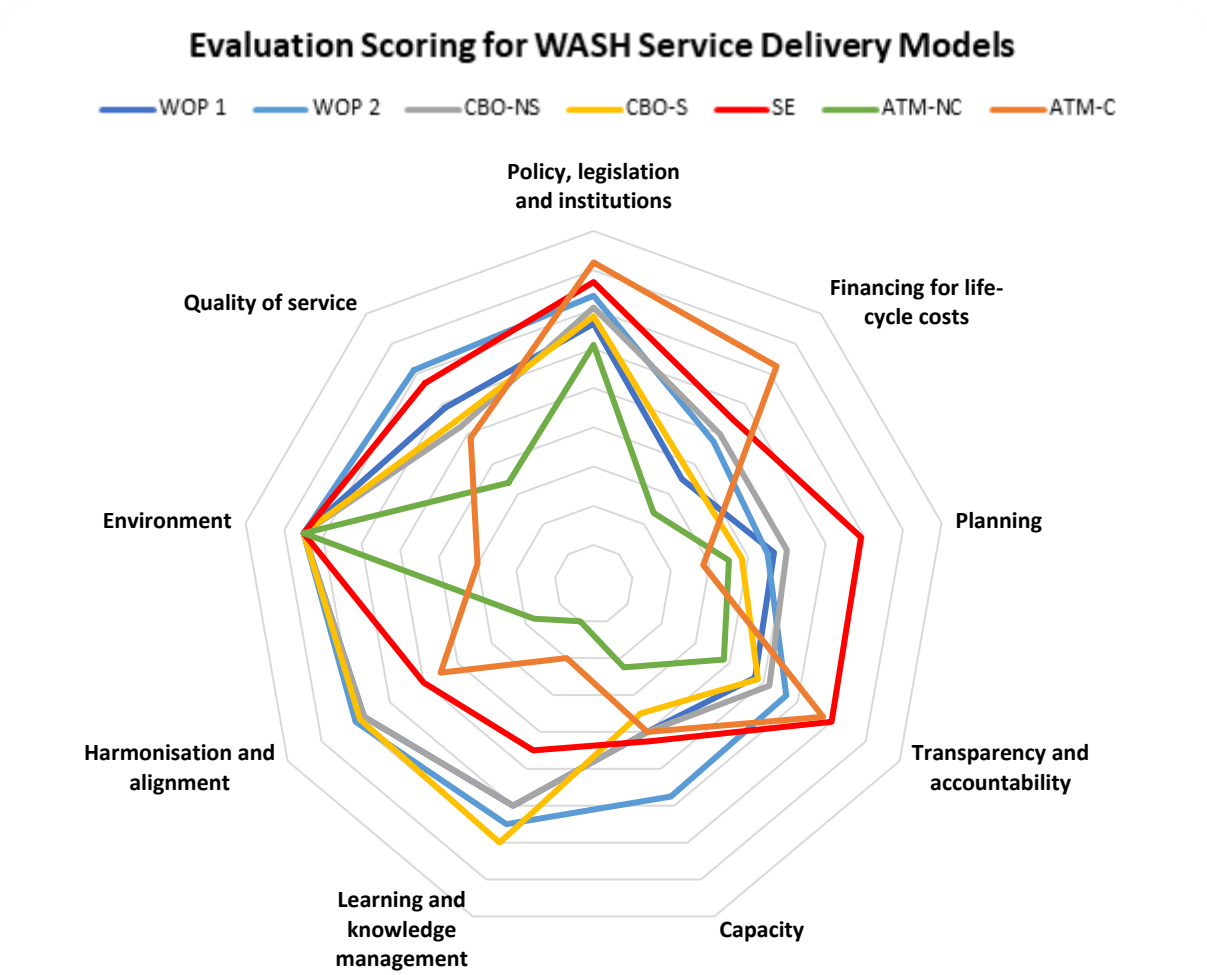
- ***Performance Evaluation Across Models***

For the performance evaluation of the selected service delivery models, it was decided to adopt and adapt the framework developed under the Triple-S initiative by IRC and Aguaconsult, at the request of USAID. The IRC framework, explicitly intended as a framework for general guidance, and chosen for its versatility was adapted to include an additional "Quality of Service" dimension with four constituent indicators. Table 2 below elaborates on the constituents of each of the dimensions of the adapted framework:

*Table 2 Definition of Performance Evaluation Dimensions*

| # | Dimension | - | Definition |
|---|---|---|---|
| **1** | **Policy, legislation and institutions** | - | Measures strength of sector policies; clarity on stakeholder mandates and service delivery models; legal mandates to service providers; empowerment and resources of service providers and use of approved technologies. |
| **2** | **Financing for life-cycle costs** | - | Measures ability to assess operational expenses and capital costs; allocate costs to and realize costs from stakeholders; and to manage physical assets effectively. |
| **3** | **Planning** | - | Measures thoroughness in planning and support received from stakeholders; involvement of the community members in planning and decision-making and whether multiple water needs and sources were considered during planning stage. |
| **4** | **Transparency and accountability** | - | Measure performance monitoring capacity; effectiveness of complaints resolution mechanisms; openness and transparency in reporting processes and accountability of service providers. |
| **5** | **Capacity** | - | Measures ability to assess training needs and provide necessary capacity building support to the service providers and the service authority (DWASA). |
| **6** | **Learning and knowledge management** | - | Measures the effectiveness and adequacy of and modalities for learning and knowledge management between implementing organizations and sector stakeholders. |
| **7** | **Harmonisation and alignment** | - | Measures uniformity in strategy and approach to water services provision; stakeholders' commitments to the approaches and effectiveness of information sharing mechanisms. |
| **8** | **Environment** | - | Measures effectiveness of environmental and social impact assessments. |
| **9** | **Quality of service** | - | Measures water quality and sufficiency; whether there is continuous (uninterrupted) and equitable service delivery; acceptability and affordability among LIC consumers; and proactiveness in dealing with irregular supply interruptions. |

The result of the performance analysis of the seven models along the above nine dimensions, as scored using the modified IRC framework is as visualized as follows:




[2]

| | Scores Worst to Best | MODELS[1] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | WOP1 | WOP2 | CBO-NS | CBO-S (Satellite) | CBO-S (City Polli) | SE | ATM-NC | ATM-C |
| Performance Scores | 0-100 | 55 | 62 | 57 | 56 | 55 | 61 | 35 | 48 |
| | Performance Ranking | 5 | 1 | 3 | 4 | 6 | 2 | 8 | 7 |

*Figure 2 Evaluation Scoring for WASH Service Delivery Models*

The WASH service delivery models evaluated under this study were found to have varying degrees of effectiveness in terms of performance. All seven models under investigation show sub-optimal performance, in that none of them are able to achieve a performance score near the maximum of 100%; the scoring rubric including specific criteria for each of the 9 dimensions and their indicators can be found in Annex 2 of this document. The CBO-led WOP2 model (score of 62%) and the SE model (score of 61%) come out as the best performing models overall. The models positioned in the middle are all CBO-led sites, in the order of CBO-NS, CBO-S (Satellite LIC), WOP1 and the CBO-S (City Polli). The lowest performing models are both Water ATM models, with the ATM-C model performing better than its CBO-led counterpart, which scored lowest at 35.2%.

[2] S = Storage; NS = No Storage; ATM = Automated Teller Machines/ Water Vending Machines; SE = Social Enterprise; C = Commercial; NC = Non-Commercial; WOP1 = 1st phase of WOP project; WOP2 = 2nd phase of WOP project

*Table 3 Performance Scores for WASH Service Delivery Models Across Dimensions*

| SL | Dimension | WOP 1 | WOP 2 | CBO-NS | CBO-S | SE | ATM-NC | ATM-C |
|---|---|---|---|---|---|---|---|---|
| 1 | **Policy, legislation and institutions** | 66 | 74 | 71 | 68 | 77 | 61 | 82 |
| 2 | **Financing for life-cycle costs** | 35 | 48 | 50 | 38 | 55 | 24 | 73 |
| 3 | **Planning** | 47 | 45 | 50 | 38 | 69 | 35 | 28 |
| 4 | **Transparency and accountability** | 48 | 57 | 52 | 48 | 70 | 38 | 68 |
| 5 | **Capacity** | 40 | 58 | 40 | 35 | 43 | 23 | 40 |
| 6 | **Learning and knowledge management** | 60 | 65 | 60 | 70 | 45 | 10 | 20 |
| 7 | **Harmonisation and alignment** | 68 | 70 | 68 | 69 | 50 | 18 | 45 |
| 8 | **Environment** | 75 | 75 | 75 | 75 | 75 | 75 | 30 |
| 9 | **Quality of service** | 59 | 71 | 53 | 54 | 67 | 34 | 49 |
| | **Average Across All Dimensions** | **55** | **62** | **57** | **55** | **61** | **35** | **48** |

** Color shades indicate relative performance across each dimension. A green shade indicates scores of 70 and above, yellow shade indicates scores between 30 and 70, and red shades indicate scores of 30 or lower.*

At the disaggregate level, the CBO models (with the exception of the ATM-NC model) and the SE model come out with different scores along different dimensions, yet they all achieve overall scores within the range of between 55 and 62. Comparing scores for the 9 dimensions of performance, it can be seen that the environmental dimension is not distinctive; for the other 8 dimensions, the WOP2 model scores the highest in 3 of them (capacity, learning and knowledge management and quality of service), while the SE model also has the higher scores in 3 different dimensions (policy & legislation, planning and transparency & accountability). However, due to the vastly different operational structure and choice of technology, recommending a singular model is not as simple as combining the best dimensions from each of the models, and this possibly warrants a follow-up study on whether a singular universal model can be designed at all.

Other than in the case of the ATM models (which are the lowest performers), the scores do not favor one particular technology or operational mode over others. In fact, the best performing WOP2 model combines non-commercial operation with a pressurized system with connection to the DMA network of DWASA without storage and the second best one, the SE model combines the exact opposites, namely commercial operation with storage. This would suggest that rather than attributing the performance of the models simply to the operational structure or technology, other qualitative factors are also at play. Case in point, an important factor which must be kept in consideration when assessing these scores is that both the WOP2 or the SE model are part of ongoing projects and neither have stood the test of time in contrast to the WOP1, ATM-NC, CBO-NS and CBO-S (Satellite) sites where donor funding has formally come to a close and NGO support gets much reduced. Other examples of underlaying success factors may also include the quality of the relationship of the service provider with DWASA and other contextual factors such as the sincerity and diligence of service providers and the political environment within the LICs.

Across the first dimension, *policy, legislation and institutions*, the commercial models have demonstrated superior performance to their CBO-led counterparts, thanks to a clear delineation of responsibilities that is communicated to and accepted by all involved stakeholders including service users and that is enshrined in the form of contracts and

agreements. The ATM-C model stands out in this aspect from other models in that its service charter or service mandate is publicly displayed to service users, unlike the other models.

Along the second dimension, *financing for life-cycle costs*, the commercial models were once again better positioned. This is because both commercial models had solid commitment from financiers for continued funding to cover expenses. Commercial models also have a more structured way of tracking costs, leading to the availability of reasonable estimates of forecasted costs and this allows them to more effectively allocate costs to their financiers and partner organizations. On the other hand, regular payments towards an O&M fund and a capital fund, as to be expected in an ideal CBO-led model, were observed only among a small minority of LIC residents for completed projects (i.e. where donor financial support had ended) which affects the long-term viability of the LIC projects. In addition, the CBO-led models, unlike the commercial models, were not observed to have any form of planning or projection mechanisms for calculating life-cycle costs. The commercial models, too, had their weaknesses. Despite the commercial nature of the services, both commercial models were found to be heavily reliant on external funding to cover capital expenditures and, in the case of the SE model, a vast portion of the O&M costs incurred. This financial hurdle is not thought to be a matter of limitation of scale, since the SE model in is facing break-even challenges even though it serves a considerable population in Bhashantek LIC. Similarly, the commercial Water ATM is already functional with 190 booths (of which 170 are operational) across Dhaka city, which should have led them to realize significant economies of scale. Drinkwell does anticipate expansion to 300 sites to lead to total operational and maintenance cost coverage, but not CAPEX coverage.

The SE model was the best performer across the third dimension, *planning*, due to more inclusive participation among residents surveyed. A major weakness of the CBO-led models was their failure to fully engage the wider LIC community such as women, minorities, the elderly and the disabled, as envisioned. Since water pricing is often packaged with house rent, payment of the water bill is the responsibility of the landlords, who consequently play the leading role within the CBO. This skewed representation is also guided by pragmatic considerations; a landlord is much less likely to migrate away and abandon his CBO duties than an ordinary LIC resident. Consequently, tenants, particularly women and the elderly have played a more limited role in CBO affairs than envisioned by the NGOs. By contrast, the ATM-C model was found not to solicit any inputs from community members other than understanding their demand for drinking water. This may be explained by the fact that these ATM booths are located outside of LICs.

In terms of *transparency and accountability*, too, the commercial SE and ATM-C models came out ahead. The ATM-C model, in particular, was closely integrated into the customer complaints channels of DWASA while the SE model operators had a dedicated hotline for logging issues. In contrast, formal transparency and accountability mechanisms, although enshrined in the CBO framework, are often not practiced and instead, informal complaint and resolution mechanisms prevail. The commercial models were also found to have dedicated staff for performing monitoring activities and reporting to financiers, whereas the CBO models were not found to have any formal, written reporting practices at all.

In the fifth dimension, *capacity*, the WOP2 model scores the highest. This was attributed to its ability to provide training not only to CBOs through the implementing NGO but also to the service authority (DWASA), where developing a base of master trainers on managing and operating a pressurized water line was essential for ensuring continued operation of the model. Although all CBO-led models supported capacity development of their CBOs, cessation of project funding led to discontinuation of capacity building initiatives, as a result of which the acumen of CBOs declined over time. Whether or not WOP2 will face a similar fate remains to be seen. It was also noted that CBO training was not tailored according to a training needs assessment process for any of the models. Neither of the commercial models were found to have engaged in training of DWASA.

The CBO-led models, in particular the actively funded CBO-S and WOP2 models scored highest in the sixth dimension, *learning and knowledge management*. The wide use of the CBO-led model provides learning and knowledge management opportunities for its stakeholders, particularly among the implementing NGOs. These opportunities do unfortunately not extend to the CBOs, the actual LIC service providers and most learning events are conducted largely on a project-by-project basis. Although major NGOs implementing the CBO-model have monthly coordination meetings with DWASA, these are focused on measures to respond to challenges and issues faced in the field, rather than on learning lessons, model adaptation and planning. As a consequence of the limited replication of the commercial SE and ATM-C models by other parties, they were found to lack regular learning and knowledge exchange initiatives between multiple LIC WASH implementing organizations that could have contributed to the continuous improvement of the models leading to very poor performance scores for both models.

Along the seventh dimension, *harmonization and alignment*, the active WOP2 and CBO-S models scored highest, followed by other CBO-led models. This is because DWASA clearly favors the CBO model as the long-term solution to water service provision in LICs. Under the CBO umbrella, individual NGOs continuously adapt the CBO model based on their own experiences however, such experiences and adaptations remain within the NGO and are not shared and used for sector-wide learning and improvement. Despite being rated by users to be among the more affordable models (taking into account the added benefit of having household level connections), the SE model is not considered as a strong alternative to the CBO-led model by DWASA on account of the considerably higher water pricing. DWASA seems concerned by the potential adverse publicity that may arise from LIC users paying a higher water tariff to the private operator than the official DWASA tariff paid by all residents in Dhaka (including affluent class residents). Ironically, the DWASA hesitation on the pricing of the SE model was not there with the ATM-C model that charges users approximately 24 times the DWASA rate (whereas the SE model charges around 2.2 times as much). The high ATM-C rate may be explained by the fact that the ATMs supply potable ready-to-drink water and that the ATM-C model is championed by a different wing of DWASA, and not the CPCR Unit that is focused specifically on LIC service provision.

For *Environment*, the eighth dimension, all CBO-led models along with the SE model demonstrated high performance. Despite not being mandated by DWASA, due to the donor-funded nature of these projects, project sponsors often require environmental and social impact assessments prior to site selection. When environmental or social impact evaluations are performed by the implementing NGOs they may be done informally (i.e. in an undocumented manner) and a formal report may or may not be submitted to the project financier, depending on the project and sponsor requirements. Only the ATM-C model exhibits a weak score in this regard as environmental or social impact assessment is deemed unnecessary since the booths are set up within the enclosed premises of DWASA. A demand assessment held within the vicinity of the WaterATMs (covering non-LIC areas as well) is considered a weak alternative to full-fledged social and environmental impact assessment.

When it comes to the ninth and possibly most consequential dimension, *Quality of Service*, which measures how the various models actually serve the LIC communities, the scores show that the WOP2 and SE are the better performers, followed by the other CBO models (WOP1, CBO-S and CBO-NS). The ATM models both perform poorly in this aspect.

*Table 4 Quality of Service Across Models*

| Indicators | WOP 1 | WOP 2 | CBO-NS | CBO-S | SE | ATM-NC | ATM-C |
|---|---|---|---|---|---|---|---|
| **9. Quality of service** | **58.8** | **71.3** | **52.5** | **54.4** | **66.9** | **33.8** | **48.8** |
| **9.1.** Water quality and sufficiency | 60.0 | 75.0 | 45.0 | 53.8 | 75.0 | 45.0 | 30.0 |
| **9.2.** Continuity and equitable service delivery | 50.0 | 70.0 | 45.0 | 52.5 | 45.0 | 40.0 | 50.0 |
| **9.3.** Acceptability and affordability | 65.0 | 72.5 | 75.0 | 67.5 | 85.0 | 25.0 | 50.0 |
| **9.4.** Supply interruptions | 60.0 | 67.5 | 45.0 | 43.8 | 62.5 | 25.0 | 65.0 |

All CBO models in Dhaka have taken a common approach whereby the water is accessed through water points that are shared by a certain number of households. A major factor is the technology adopted for service delivery; conventional wisdom suggests that technologies with reservoir systems will offer better quality of service by virtue of storing water for use during times of low supply. For the most part this was indeed the case. However, the pressurized CBO-led model of WOP2 performed best among all the CBO-led models despite having no storage capability. The variance in CBO-led models' scores suggest that the effectiveness of the models depends to a large extent on the stakeholders involved, whereby larger and reputable implementing organizations (such as DSK and WOP) with continued availability of financial and technical resources have outsized influence and advocacy capacity with other sector stakeholders notably DWASA, to ensure adequate service quality in terms of water quality, supply continuity and sufficiency and supply interruptions.

On the other hand, the only example of a CBO-led water vending machine was found to be largely ineffective due primarily to not having reached a low enough price point to have a critical level of demand to maintain operational costs sourced exclusively from the community.

Among the best performers, WOP2 and SE, their disaggregated scores show that the SE model clearly underperforms on continuity of supply. This is due to the limited supply by DWASA that cannot be completely overcome by the overhead storage tanks of the LIC system. The low score can therefore be attributed to both the inability of DWASA to provide uninterrupted service and failure on the part of the operators to anticipate this level of service interruption and does not necessarily point to inherent problem of the model itself. Rather, without storage, the problem with the continuity of supply would likely be worse. On the other hand, the WOP2 model fares well across all quality of service dimensions as it has been able to provide mostly uninterrupted supply to users, which can be attributed to the close engagement of DWASA in managing the pressurized network through the WOP as well as the project's success so far in preventing other illegal water lines from sprouting up in the Zamindar Bari LIC where the research was conducted.

Although quality of service is significantly better for the SE model compared to the CBO-led models, this comes at the cost of a higher price. However, as previously mentioned, the SE model was rated as among the more affordable models by its users after having taken into account the added benefits of having household level connections, which may make it suitable for implementing in other comparatively affluent LICs in Dhaka.

- ***Risk Management***

Among the models evaluated, the WOP2 and the ATM-C models had the lowest risk profiles. The risk score for the second-best model in terms of performance, SE, was considerably higher at 5.2, but the risks are considered manageable. On a scale of 1-9 (higher score denoting higher risk, none of the models scored above a 6, which would have denoted significant risk that would warrant development of mitigation plans and even question the viability of project continuation. Having said that, the ATM-NC model with the second highest risk score, coupled with being the lowest-performing model is undoubtedly the weakest model evaluated and is not expected to sustain for long without external support.

*Table 5 Risk Assessment Scores Across Models*

| | Scores Worst to Best | MODELS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | WOP1 | WOP2 | CBO-NS | CBO-S (Satellite) | CBO-S (City Polli) | SE | ATM-NC | ATM-C |
| **Risk Scores** | 9-1 | 4.4 | 2.9 | 5.3 | 5.8 | 4.1 | 5.2 | 5.7 | 3.6 |
| | **Risk Ranking** | **4** | **1** | **6** | **8** | **3** | **5** | **7** | **2** |

| **Risk Assessment** | | | | | | | **Risk Management** | |
|---|---|---|---|---|---|---|---|---|
| | | | **Probability** | | | | **Score** | **Risk management strategy** |
| | | | **High** | **Medium** | **Low** | | 9 | Rethink project viability |
| | | | **3** | **2** | **1** | | 6 | Mitigation Plan Needed |
| **Impact** | **High** | 3 | 9 | 6 | 3 | | 3 to 4 | Review and address |
| | **Medium** | 2 | 6 | 4 | 2 | | 2 | Monitor |
| | **Low** | 1 | 3 | 2 | 1 | | 1 | Accept and Ignore |

When looking at the risks, it does not appear that any particular technology or operational model comes with significantly higher or lower overall risk profiles. The overall risks for non-storage models range from 2.9 to 5.3; for the storage models the risk scores range from 4.1 to 5.8 and for the ATM scores range are 3.6 and 5.7. The same inconclusive variation of scores applies to non-commercial models where scores range from 2.9 to 5.8, compared to the commercial models where scores are 3.6 and 5.2.

When comparing the best two performing models (WOP and SE), it can be seen that the environmental risk is not distinctive for the two models. Instead, their diverging risk profiles are due to WOP2's lower risk exposure in all the remaining six risk categories, the score differences fluctuating between a low of 0.8 in the operational risk category up to a 3.3 for the political risk category. Rather than an inherent weakness in the operational structure itself, the higher risks for the SE model may have resulted from the specific circumstances such as the higher cost of the service resulting from the higher service level, the relatively small scale at which the model is applied (inability to take advantage of economies of scale), the absence of a champion that promotes the model with DWASA and the fact that DWASA does not consider the SE model as a valid alternative or welcome supplement to the CBO-led models. These differences in risk profiles between the two models would seem to suggest that at least for some risks the SE model may well learn from WOP2.

Regardless of whether they prescribe to the CBO-managed nonprofit models or the commercial models, the financial pressure on all water operators - except for the ATM-C model - is expected to exacerbate in the near term, due to expected annual tariff increase risk by DWASA at a time when the incomes of the LIC population have been impacted adversely by the economic disruption caused by the COVID-19 pandemic. These tariff increases may then have a negative effect on the quality of service provided if operators cannot pass these increases on to the LIC customers and have to economize on expenses. The threat of eviction and local political opposition from vested interested groups are also constant threats for operation in LICs, regardless of the model of service delivery, but the scale of these risks been observed to vary from site to site.

It should be noted that the WOP2's highest score in performance and lowest risk exposure should not be interpreted as an automatic sign of success. Indeed, the WOP1's more average position both in terms of performance and risk should act as a note of warning to WOP2 project stakeholders about a possible eventuality that may face the project in the absence of sufficient post-project support.

## Summary of Recommendations

Given that no clear single "winner" has emerged that justifies a wholesale transition to one particular model, this report has identified several incremental recommendations targeted at various audience groups, rather than prescribing any single model.

- ***Recommendations and Best Practices for DWASA***

As the dedicated body to provide legal water service connection to residents in Dhaka city, it is suggested that DWASA, particularly the CPCR Unit, undertake the following recommendations:

1. **Develop central knowledge base on LIC WASH services provision** – Under the custody of DWASA or the NGO Forum for DWSS, and with contributions from all sector stakeholders, a dedicated learning and knowledge sharing repository for LIC WASH service provision should be established for open access to information.

2. **Develop multi-stakeholder plan for WASH in LICs anchored by DWASA** - Under the leadership of DWASA, it is recommended that a national/city-wide plan of action for LIC WASH service provision be drawn up with the participation of all major WASH stakeholders. Such a plan should focus on how WASH finance can be mobilized on a collective basis and the priority areas for the fund mobilization should be jointly decided. An action plan should also involve DWASA soliciting support for and leading a multi-stakeholder effort to define a limited number of sustainable LIC service models, considering the development, implementation and operational phases and including various technologies and operational models. Such an action plan could be modelled after the Bangladesh's Country Investment Plan on Nutrition, which was a multi-sectoral plan involving multiple line ministry, development partners, NGOs and private sector organizations, bringing all the parties into alignment over their priorities over the next five years.

3. **DWASA should keep multiple models in contention which may be suitable in different LIC contexts** – This study has found that residents in the relatively more affluent LICs may find the direct-to-home water service to be more desirable from a user experience and accessibility perspective, despite the higher price. DWASA should consider increasing its support for replication of the Social Enterprise model and give emphasis on playing a regulatory role to ensure that commercial and social enterprise service providers are charging a water service capped under a certain level.

4. **Introduce measures to empower and hold CBOs accountable** – Measures such as public display of CBO service charters to the community, increasing CBO diversity by limiting representation of landlords while increasing participation of minorities, and integration of CBO complaints mechanism with DWASA hotline could all help to increase CBOs' accountability to their community members.

5. **Integrate regular planning events into the operations of the CPCR Unit** – In addition to existing monthly coordination meetings, the CPCR unit should take the initiative to lead regular multi-stakeholder meetings attended by the senior management of DWASA to reflect on lessons learnt and facilitate proactive discussion on future planning and risk monitoring.

6. **Expedite implementation of progressive tariff scheme of DWASA** – Annual tariff increases from DWASA, as observed in the past few years are expected to exacerbate the financial situation of LIC customers, who have already been affected by coronavirus pandemic. To avoid such an outcome, it is recommended that the DWASA expedite approval and implementation of the planned progressive pricing scheme, taking int consideration inputs from LIC residents.

- ***Recommendations and Best Practices for other WASH Sector Stakeholders***

The broader recommendations for the wider WASH sector stakeholders (including donors, project sponsors/financiers, project planners and project implementing organizations), in order of importance, are as follows:

1. **Pooling of technical and human resources with other sector stakeholders to achieve economies of scale and extend post-project support ability** - Perhaps the biggest insight from this study is that CBO-led projects require considerable post-project completion support. The fact that the CBO-managed models are operational across several hundred LICs in Dhaka city offers significant room for service consolidation by the myriad actors to derive economies of scale. During implementation, economies of scale can be achieved in terms of conducting training (including DWASA training, CBO orientation and refresher trainings) and knowledge exchange sessions (which are now conducted on a project-by-project basis). After completion, pooling of financial assets (such as CBOs' asset management funds) and human resources (e.g. technicians, trainers, engineers etc.) as well as fund raising efforts with development partners and coordinated community events and campaigns by implementing organizations cannot only ensure that duplication of services is avoided but also ensure that CBOs in post-completion areas have a fallback mechanism for requesting urgent support. Such an accumulation of resources can also allow advocacy efforts with DWASA, for example on implementation of a progressive tariff scheme, to be more successful.

2. **Take measures to improve composition and diversity of CBO leadership** – In case such an initiative is not taken by DWASA first, project financiers could mandate a minimum representation of tenants, including quotas for minority representation, within the CBO leadership in order to ensure that landlords do not exercise a discriminatorily high influence in the CBOs' decision-making process. Although it is difficult to have stability in CBO leadership with tenants if the residence of tenants is only transient, implementing organizations can seek out other options to accommodate for this, such as having an intentionally rotational leadership. Perhaps a follow up study may be necessitated to explore and pilot various options on to improve diversity in CBO leadership. In addition, background checks should be conducted on the CBO members to ensure they do not have any vested interests in illegal water service provision.

3. **Publicly disseminate service charters and formalize complaints channels to improve accountability** – Implementing organizations should compel CBOs to publicly display their service charters outlining the roles and responsibilities of the CBOs, which are already enshrined in most tri-party agreements between NGOs/WOP, CBOs and DWASA at present. To improve accountability further, the informal CBO complaints mechanisms could be integrated with DWASA's hotline for formalized complaints tracking and resolution.

4. **Facilitate tailored and on-demand training** – Capacity building initiatives aimed at CBOs should make every effort to tailor training sessions based on a needs assessment exercise and also factor in post-project completion refresher trainings to address the eventuality that CBO members are replaced and their level of skills decline over time. A frugal way to perform refresher training of CBOs could be to digitize training materials in the form of e-learning apps that could be accessed by CBOs on-demand any time after formal conclusion of a project.

5. **Educate community members on and engage them in the selection of technology and operational structure** – In contrast to the current top-down approach, LIC community members should be educated (including through visits to other LICs) on the universe of available water service delivery models prior to consultation and selection of a particular model. A mutual decision by project financiers and community members can help ensure full ownership and the longer-term sustainability of the project.

6. **Perform comprehensive project planning** – Project initiators should conduct thorough project risk assessment, attempting to foresee risks beyond project financing lifetime for example of not being able to provide water in desired sufficiency after a period, or of increased demand in surrounding non-LIC communities or the risk of illegal water service providers returning to the community. Based on the identified risks, risk owners should factor in mitigation strategies and contingencies for long-term eventualities prior to implementation

7. **Conduct independent and comprehensive social and environmental impact assessment** – Project financiers should make it mandatory to conduct a well-documented environmental and social impact assessment study performed by independent third parties prior to site finalization. Any issues identified in the course of the study should be adequately addressed prior to proceeding with implementation.

8. **Consult land administrators prior to site selection** - Although evictions of slums on public land will undoubtedly continue, there may be room for dialogue with the largest owners of public land which host LICs (such as the NHA) to understand their long-term plans regarding particular sites and ensure that projects deliver value to LIC residents over the longest possible time.

In conclusion, the CBO-led model which has undoubtedly improved over time via trial and error through multiple iterations has several areas for improvement. At the same time, its wide replication in the context of Dhaka city also offers significant scope for exploitation in terms of service consolidation and reducing duplication. For the more affluent LICs and also for more affluent sections of large LICs, the commercial models, in particular the SE model with its household level connections, could be strong alternatives to the dominant shared, CBO-led water point model.

If DWASA, WOP and sector stakeholders are able to take suggested steps to improve upon the models and exploit potential economies of scale, they can not only improve the quality of service for beneficiaries but also deliver significant cost savings, which would be more important going forward as donor contributions may diminish over time as Bangladesh graduates from being an LDC country and as DWASA pivots to a more self-sufficient model.

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# Background of the Study

For providing legal water services among the Low-Income Community (LIC) of Dhaka City, DWASA created a separate wing named the Community Program and Consumer Relation (CPCR) Division by changing its organogram in 2010. This division works for providing safe legal water services for LIC (slum) people. According to the CPCR monthly report of September 2020, the total number of legal connections on record is 6,617. The total number of families using the water connections is 155,806 (689,921 population). CPCR unit has been working in a total of 435 slums along with NGOs and other implementing partners. However, according to UNICEF, Dhaka has more than 5,000 slums with an estimated population of 4 million, which implies that 10% of Dhaka's slums and about 17% of the slum population are covered through legal connections.[3]

DWASA and VEI with financial support from EKN embarked on the Water Operators Partnership (WOP) project between 2013-2017 with the aim to provide improved access to Water, sanitation and hygiene (WASH) services in the Low-Income Community (LIC) Areas of Dhaka City. During WOP1 implementation, 30,000 slum dwellers were provided with WASH services and WOP2 is expected to serve an additional 13,500 slum dwellers. WOP has developed its own approach to providing LIC services by applying the learnings from VEI's experiences elsewhere to the locally developed and widely applied CBO model. This model is characterized by a non-commercial approach where the responsibility for managing the WASH system lies with the slum community. The present WOP2 follows up on WOP1 and runs from 2017-2021 with the overall objective of contributing to sustainable water services delivery to the public, including low-income communities, through improvement of DMA operations. At present, the WOP2 provides water access through a pressurized piped network in the LIC that is integrated with the DWASA network of the Dhaka Metropolitan Area. The pressurized piped network for LIC WASH service provision is the first of its kind in Dhaka city.

The WOP project recognizes the importance of selecting the optimal WASH service delivery model, and is open to refining the WOP service delivery model to deliver enhanced value to its beneficiaries. Unfortunately, to date there has been no comprehensively-done comparative and independent research that investigated the feasibility and sustainability of WASH services looking at the wide variety of WASH Services Delivery models that are being used across LICs in Dhaka (or Bangladesh for that matter). As a consequence, VEI appointed LightCastle Partners (also referred to as LCP hereon) to conduct an independent, comparative research that can identify the relative strengths and weaknesses of various operational WASH service delivery models in Dhaka. The main objectives of this study are to:

- Document and mainstream the experience and lessons learned in the implementation of WOP's WASH Service Delivery Model including advising on a reorienting WOP's LIC activities for enhanced impact;
- Make an independent assessment of the effectiveness, the longer-term sustainability and the feasibility of the different WASH Service Delivery Models used in Dhaka's LICs, and to assess the risks regarding the financing and the implementation of LIC projects;
- Determine the causes for the observed performance of the various WASH Service Delivery Models and to derive lessons and recommendations necessary for improvement, acceleration, or revision of the models.

[3] Source: UNICEF, 2015, Analysis of the Situation of Children and Women in Bangladesh 2015. Accessible at: https://www.unicef.org/bangladesh/sites/unicef.org.bangladesh/files/2018-08/Analysis_of_the_Situation_of_Children_and_Women_in_Bangladesh_Low_23-06-2016.pdf, [Accessed on 23.12.2020].

The nature of the study necessitated a review of the current 'landscape' of LICs projects in Dhaka through consultation with various stakeholders to derive listing of LIC areas in which WASH Service Delivery Models have been implemented, in which year and by which organization. The types of model combinations identified have been listed in Chapter 1, with a detailed list of LIC sites identified in the Annexure. The methodology adopted for conducting the study is outlined in detail in Chapter 2.

Based on the identified WASH Service Delivery Models, LCP has made an independent assessment of the relative effectiveness (quality of service, performance and strengths and weaknesses of each model across multiple dimensions) and the longer-term sustainability and the feasibility of the different models used in the LICs of Dhaka by the various implementing organizations. LCP has also assessed the risks regarding the financing and implementation of projects aimed at improving the water supply in LIC areas taking the contextual factors into account. The model performance evaluation and risk assessment findings are presented individually for each model in isolation to each other in Chapter 3 of the study while the relative comparison of the evaluations of each model is presented in Chapter 4.

Based on the comparative evaluation, LCP has assessed the causes for the observed performances and drawn lessons/recommendations for improvement, acceleration, or revision for the WOP project stakeholders as well as for the wider WASH sector stakeholders. The conclusions drawn from the comparative evaluation and the implication of the findings in terms of recommendations are presented in Chapter 5 of this report.

# Chapter 1. **Project Overview**

## *1.1. Overview of the LIC WASH sector in Dhaka*

Safe water, appropriate sanitation facilities, and good hygiene practice are essential elements for a healthy life. However, a large majority of the Bangladeshi population cannot access safe drinking water, one of the most fundamental basic health services. The WHO estimates that 97% of Bangladeshi people have access to water and only 40% percent have proper sanitation[4]. According to the Bangladesh Multiple Indicator Cluster Survey (MICS) 2019, the availability of drinking water in Bangladesh had increased significantly from 74.2% in 2012-13 to 96.9% in 2019. However, 81.9% of the population had to access contaminated household drinking water.[5]

In Bangladesh, The Department of Public Health and Engineering (DPHE) is responsible for supplying water to the citizens all over the country except where there is Water Supply and Sewerage Authority (WASA) within the City Corporation areas. However, people living in the urban Low-Income Communities (LIC) areas do not have access to a household identification number (holding number), without which, they were unable to receive a legal and metered water connection from the WASA. Through continuous evidenced-based advocacy and communication by DSK, the DWASA Gazette, in 2007, recognized the rights of slum dwellers to apply for legal connections from DWASA. Further to this, DWASA's Low-income Customer Support Unit (LIC Unit) was established in 2010 in the Community Programme and Consumer Relation Division (CP&CRD).[6]

In order to increase access of slum dwellers to the public water supply system within the LICs of Dhaka City Corporation, various NGOs (both local and international), social enterprises and business enterprises along with some WASH networking agencies are working with multiple donor agencies and Dhaka WASA (DWASA). They are implementing community-based projects that provide access to safe water to the households living in Dhaka's LIC areas by means of legal connections. Moreover, they are working on strengthening the stakeholders' capacity and providing a sustainable solution to the community.

Some organizations active in the provision of water services to LICs in Dhaka city are:

*Table 6 Major LIC WASH sector stakeholders in Dhaka[7]*

| **International NGOs:** | **WASH networking agencies in Bangladesh** |
|---|---|
| • Water and Life;<br>• SNV;<br>• WSUP;<br>• WaterAid;<br>• Water.org;<br>• Practical Action;<br>• Solidarites International;<br>• Simavi;<br>• OXFAM | • National Forum for Water Supply and Sanitation (NFWSS);<br>• Local Consultative Sub-Group (LCG);<br>• Water Supply and Sanitation Coordination Council (WSSCC);<br>• Bangladesh Urban Round Table (BURT);<br>• Community Led Total Sanitation (CLTS) Network; |

[4] Source: The Water Project (N.D.), Water in Crisis - Spotlight on Bangladesh. Accessible at: https://thewaterproject.org/water-crisis/water-in-crisis-bangladesh, [Accessed on 20.12.2020].
[5] Source: UNICEF,2019, Multiple Indicator Cluster Survey, Bangladesh.
[6] Source: DSK, 2019, DSK WASH Experience in Bangladesh. Accessible at : http://www.dskbangladesh.org/download/Publications/WASH-Experience.pdf, [Accessed on 20.12.2020].
[7] Source: Secondary research and LightCastle primary research: Discussion with WOP.

| Multilateral and Bilateral agencies: | Local NGOs: |
|---|---|
| • UNICEF;<br>• ADB;<br>• AFD;<br>• DFID;<br>• Swedish International Development Cooperation Agency (SIDA);<br>• JTI Foundation | • NGO Forum for Drinking Water Supply and Sanitation (DWSS);<br>• Dushtha Shashthya Kendra (DSK),<br>• BASA,<br>• NDBUS,<br>• Sajida Foundation,<br>• SPACE<br>• IPD |

## *1.2. Overview of the operational models in the WASH sector in Dhaka*

In Dhaka, water service provision in LICs is done by both for-profit and non-profit arrangements. Most of the non-profit water service providers choose to operate through Community Based Organizations (CBOs). The CBO model is explained briefly in Box 1 below:

***Box 1. The CBO Model***

The CBO model is characterized by the involvement of a Community Based Organization (CBO) that manages and operates the WASH facilities on behalf of the community. An NGO is usually also involved in the process and provides support to the CBO where needed; the NGO usually intermediates between DWASA and the CBO regarding planning and construction of facilities, collection of fees, payment of bills, etc. The model releases DWASA from its need to invest in infrastructure in informal areas, as the community, the NGO, and development partners share these costs by contributions in cash and kind. Private/commercial water-operators and vendors are illegal by the Bangladeshi law – although recently provisions have been made to allow business enterprises to move into this space under specific conditions – and the preference is for community management and operation of the infrastructure.

For providing legal water services among the Low-Income Community (LIC) of Dhaka City DWASA created a wing named Community Program and Consumer Relation (CPCR) Division by changing its organogram in 2010. This division works for providing safe legal water services for LIC (slum) people. According to the CPCR monthly report of September 2020, the total number of legal connections on record is 6,617. The total number of families using the water connections is 155,806 (689,921 population). CPCR unit has been working in a total of 435 slums along with NGOs and other implementing partners. However, according to UNICEF, Dhaka has more than 5,000 slums with an estimated population of 4 million, meaning that 10% of its slums and about 17% of the slum population are covered through legal connections.[8]

The CBOs have constitutions that state their goals and objectives and provide eligibility criteria for membership. Each CBO usually has its Executive Committee, which comprises a Chairperson, Vice-Chairperson, General Secretary, Treasurer, and three to seven other members. The constitution also describes the roles and responsibilities of the Executive Committee and of executives. When the CBO is established, a CBO representative applies (with all necessary papers for a water connection as outlined by

[8] Source: UNICEF, 2015, Analysis of the Situation of Children and Women in Bangladesh 2015. Accessible at: https://www.unicef.org/bangladesh/sites/unicef.org.bangladesh/files/2018-08/Analysis_of_the_Situation_of_Children_and_Women_in_Bangladesh_Low_23-06-2016.pdf, [Accessed on 23.12.2020].

DWASA for LICs/slums) to the DWASA Community Programme and Consumer Relationship Division for verification and approval for the water connection.

The CBO monitors the application through the various approval processes until the consumer community/group receives a connection for legal access to the utility's water source. CBOs also have a role in maintaining the connection as well as the collection and payments of water bills. CBOs usually employ a caretaker who takes the meter reading on behalf of DWASA and prepares the bill for each meter. The caretaker also collects bills from consumers and makes payments at the designated bank. The CBOs also take consumer complaints to DWASA for resolution.

The model for providing a legal water connection to low-income communities in Dhaka is based on a partnership between slum dwellers and their CBO, and NGOs, and DWASA. The requirement for getting a legal water connection starts with the formation of a CBO, so it is imperative that the people of the low-income communities/slums come together with a common vision and understanding, whose foundation might be the objective of getting legal water connection, but ultimately branched into other common interest avenues.

Generally, the roles of a CBO include:

- Properly maintaining legal water connections in the area;
- Paying WASA bill regularly and collect due bills;
- Actively preventing misuse of water and resisting new illegal connections;
- collecting a service charge or contributions to a community fund for O&M and capital costs, totaling up to a specified limit; these collections can be regular (e.g., monthly) or irregular.

NGOs play a vital role in developing the CBO through supporting the low-income community/slum dwellers to become aware of the process, providing them the technical knowledge, facilitating the formation of CBO, supporting members to understand the management of the CBO, its responsibilities, and the roles and responsibilities of its office bearers.[9]

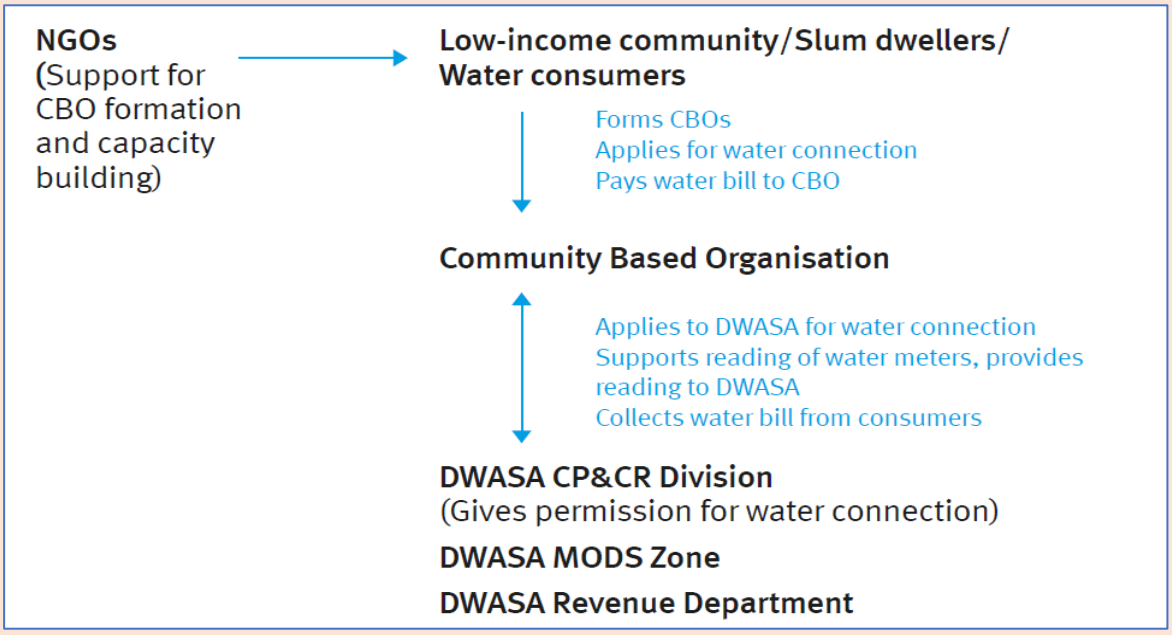



*Figure 3 Process to obtain a legal water connection by LIC dwellers using CBO model (Source: WaterAid)*

[9] Source: WaterAid, 2016, Bangladesh Low-Income Support Unit.

Please note that the modality of payment varies from LIC to LIC. While most CBOs collect payment from users and forward it to DWASA, in some areas (such as under WOP project) the CBO forwards the collected payment to the NGO and the NGO then forwards the payment to DWASA. In some other areas (such as for SAJIDA Foundation projects) households pay directly to meter readers of DWASA who come for collection on-site without CBO involvement in this process.

In differentiating competing water service delivery models in LIC communities, we have chosen to segregate the models into two broad dimensions - the first being the business model structure and the second dimension being the technology used for water service delivery. In addition, there are differences in implementation, ownership, and management of the systems. Using the two broad dimensions, the following projects matrix is derived:

*Table 7 Model identification matrix for comparative study*

| **Technology** | **Model # and name** | | **Implementation, ownership and management** | | | **Business Model** |
|---|---|---|---|---|---|---|
| | | | Implementing parties | System operator | System owner | |
| Water Points without Storage | 1 | WOP1-NS | VEI + DSK + Simavi | CBO | DWASA | Not for Profit |
| | | WOP2-NS | VEI + DSK | CBO | DWASA | Not for Profit |
| | 2 | CBO-NS* | DSK + AFD | CBO | DWASA | Not for Profit |
| Water Points with Storage | 3 | CBO-S* | DSK + AFD | CBO | DWASA | Not for Profit |
| | | CBO-S* | SAJIDA + WaterAid | CBO | DWASA | Not for Profit |
| | 4 | SE | Eau et Vie + Shobar Jonno Pani (SJP) | SJP | SJP | For Profit |
| Water Vending Machines (ATMs) | 5 | ATM-NC | Plan Int'l + DSK | CBO | DWASA | Not for Profit |
| | 6 | ATM-C | Drinkwell Water | Third-Party Operator | DWASA | For Profit |

S = STORAGE
NS = NO STORAGE
ATM = AUTOMATED TELLER MACHINES/ WATER VENDING MACHINES
SE = SOCIAL ENTERPRISE
C = COMMERCIAL
NC = NON-COMMERCIAL
* Note that CBOs within the model name refer to non-WOP1 or non-WOP2 CBO models only. WOP1 and WOP2 project areas also operate through the use of CBOs.

Each of the derivative models are explored in further detail below:

### 1.2.1. Water Operators Partnership Model (Model #1)

In Dhaka, the capital of Bangladesh, the Dhaka Water Supply and Sewerage Authority (DWASA) is signaling rapidly declining groundwater tables, severe environmental pollution, climate change, deteriorating infrastructure, and a fast growing and demanding population. In order to prepare itself for the future, DWASA acknowledges that action is required in terms of infrastructure investments and improvement of its organization and operations. One of the actions being undertaken is the Water Operators Partnership (WOP) between Dhaka WASA and VEI Ltd., which started in 2012.

The partnership aims to enhance the operational performance and the management of the Dhaka Water Supply and Sewerage Authority (DWASA) and includes, among others, technical and financial support to DWASA in its efforts to provide water, sanitation and hygiene promotion services (WASH) to the urban poor. Both WOP1 (2012-2017) and WOP2 (2017-2021) included a WASH component, whereby WOP2 built on the experiences of WOP1.

***Site #1 - WOP1-NS Model (Model #1)***

The first iteration of the WOP, known as WOP1 was initiated in 2012. For the first LIC project Dhamalkot 1, WOP1 partnered with DSK and the Dutch NGO Simavi. Under the LIC projects of WOP1, 176 water supply points and 71 sanitation facilities were installed. About 14,000 inhabitants of Dhamalkot received access to suitable, legal and quality WASH facilities at the end of the project. Moreover, about 10,000 inhabitants of Jheelpar received training on health and hygiene practices.10 The end-of-project shortfall of 35,000 targeted beneficiaries (against a targeted 65,000 population) was carried forward and became one of the 15 KPIs for WOP2.

The WOP1 project set up CBOs and the role performed by DSK included community mobilization, the establishment of the CBO, the management of construction of water supply and sanitation facilities through community contractors, and hygiene education. VEI delivered technical assistance to DWASA, while Simavi's role was to support the implementation of an integrated WASH approach (including hygiene promotion, advocacy, and awareness-building activities) in project LICs in Dhaka. DSK and Simavi mobilized, organized, and empowered the communities to form a CBO that assumes responsibility for managing the water and sanitation facilities. In the WOP1 model, CBOs entered a contract with DWASA, in which DWASA ensures continuous water provision to the communities, and the CBO ensures that water bills are paid to DWASA, a model which was replicated in WOP2 but with even greater involvement of DWASA in ensuring uninterrupted supply of water.

The CBO charges the regular tariff of DWASA which is BDT16.63/cubic meter including VAT from its users.

From a technology perspective, WOP1 provided communities with metered water points (hand pumps) with or with or without a reservoir (storage or non-storage). The non-storage tank water points were established in areas where land was scarce, and in this case, the water points were designed to cater to a targeted set of people per water point.

[10] Source: WOP, 2017, WOP1 Final Narrative Report.

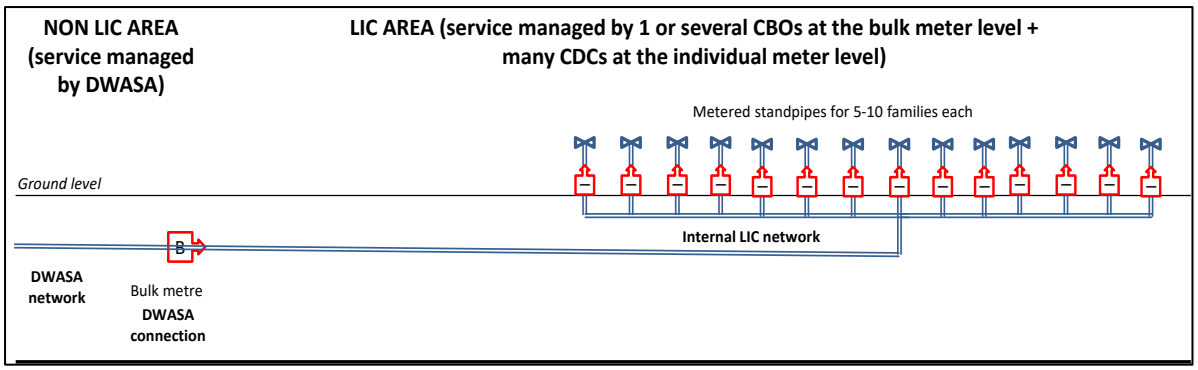



*Figure 4 WOP1-NS Model*

**System Operator:** Under WOP1, water service was provided through the CBOs, with training and support from DSK. It was the responsibility of the CBOs to manage the service provision concerning the water distribution system within the LIC, and ensuring the upkeep of water points and tariff collection.

**System Owner:** DWASA is the legal owner of the piped up to the point outside the LIC boundary. The CBOs are the owners of the internal piped network leading to the water points.

***Site #2 – WOP2-NS Model (Model #2)***

The more recent iteration of the WOP, referred to as WOP2 project, is being implemented over a four-year project period (July 2017 – June 2021). The goal of WOP2 is to enhance DWASA's operations and performance, by building on the lessons learned from WOP1. WOP2 project focuses on upscaling activities regarding operation and maintenance, NRW, SCADA and improving access and services delivery of water for the urban poor living in low-income communities. The concerned KPI requires WOP2 to establish water supply services for 35,000 inhabitants of LIC areas. The WOP2 project's midterm review viewed this as unachievable and recommended to reduce this number to 15,000.[11]

WOP2 project has been active in the 6 DMAs under 3 zones, namely DMA 314 and DMA 316 (Zone 3), DMA 401 and DMA 410 (Zone 4), and DMA 1003 and DMA 1004 (Zone 10). The work in the LICs was focused on MODS Zone 10, where WOP2 has completed LIC projects in Moddhyapara, Lalsharai Tek para, and Zamindar Bari of Dhamalkot 3.

WOP2 project, like WOP1 project, also operated using the help of CBOs. The work of NGO partner, DSK, is limited to community mobilization and the establishment of the CBO as well as construction of water supply and sanitation facilities through community contractors, and hygiene education. Sanitation and health education are not included in WOP2, but will be executed by WaterAid, as agreed in an MoU between WOP2 and WaterAid. WOP2 prepared the technical designs for the LIC water systems, including, where needed, interventions in the DWASA network. A professional, qualified contractor was hired by WOP2 project for the construction of the water supply.

[11] Source: WOP, 2019, Mid Term Report WOP2.

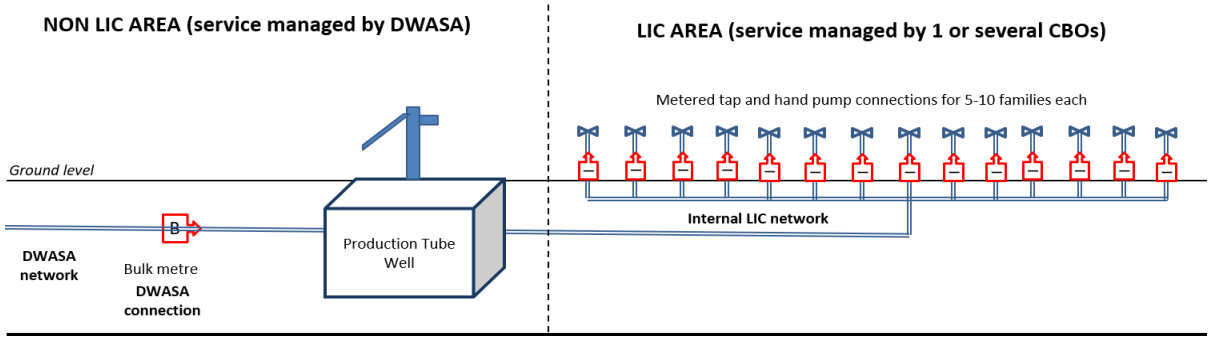



*Figure 5 WOP2-NS model*

The technical difference between WOP1 and WOP2 projects is that the WOP1 project also had sites where water service provision was enabled through water points with reservoirs (as in the CBO-S model described in a later section), whereas WOP2 exclusively provides a pipe network in the LIC and ensures adequate pressure in the network by integrating it with the DWASA network in the concerned DMA, including, where necessary, improvements to the DWASA network. The WOP2 network provides water points that have both a tap and a hand pump, whereas WOP1 did not have the tap option for residents. Hence, the WOP2-NS model has no in-slum tanks, storage or pumping as it relies on DWASA supply and pressure.

However, the pressurized system brings its own sustainability risks. In their comparative analysis of water service delivery models, WSUP[12] states that the sustainability of the pressurized non-storage arrangement is expected to be lower than storage water point arrangement on account of higher operational complexity, the need for operational staff, increased dependency on the CBO and DWASA. DWASA has to ensure supply in the needed quantity and pressure at their point of delivery.

It is precisely to address this risk that the WOP2-NS model has taken the initiative to partner closely with DWASA, providing them with technical, financial and infrastructural assistance and linking DWASA to the CBO to establish a channel of communications – all designed to give DWASA responsibility and ownership over the LICs' water network and establish a sustainable solution. In technical terms, the LIC system is connected to the nearest DMA network and where necessary to ensure supply, additional investments are made in the DWASA system such as a new supply line pipe, borehole or pump. The LIC inhabitants under WOP2-NS model pay the regular water tariff set by the DWASA, considering WOP2 and DWASA (partially) sponsored the costs for network construction.

The CBO charges the regular charge of DWASA which is BDT16.63/cubic meter including VAT from its users.

**System Operator:** It is the responsibility of CBOs to manage the service provision, ensuring the upkeep of water points and tariff collection. It is the responsibility of DWASA to maintain service continuity and respond to service interruptions arising from their portion of the distribution network.

**System Owner:** DWASA is the legal owner of the pipe up to the point outside the LIC boundary. The CBOs are the owners of the internal piped network leading to the water points.

[12] Source: WSUP, 2013, Which Water Service Delivery Models (WSDM) for Low Income Consumers (LIC) in Dhaka?.

### 1.2.2. Non-WOP CBO Models (Model #3 and Model #4)

Most of the not-for-profit water service providers choose to operate through Community Based Organizations (CBOs). However, there are two technology types that they use – water points with storage/reservoir or standposts with no reservoir. These two different models are explored in further detail below:

***Site #3 – CBO-NS Model (Model #3)***

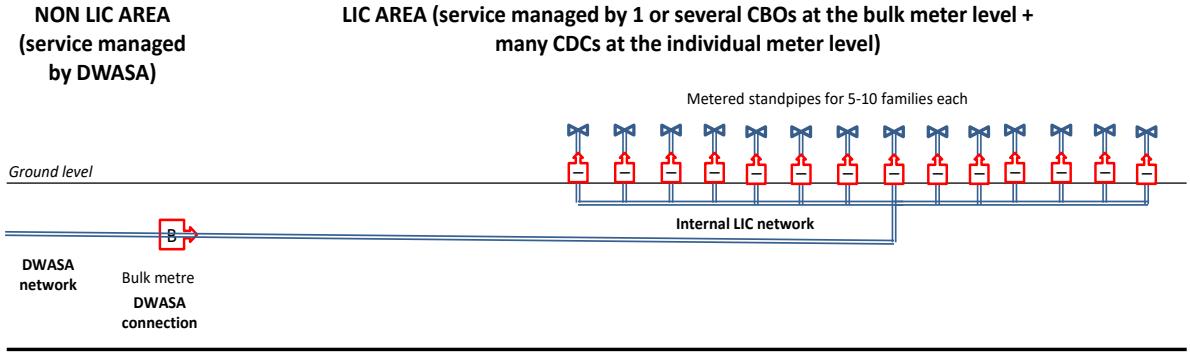



*Figure 6 CBO-NS model*

Under the standpost model, a pressurized pipe network in the LIC is integrated with the DWASA network in the DMA. The network provides water access through water points (standposts) without the need for a reservoir for interim storage. This version of the CBO model requires less land due to the non-requirement of a reservoir space. However, this model is largely dependent on a constant, sufficiently pressurized water supply from the utility provider (DWASA). Field implementations of this model indicate that continuity and adequate quantity and pressure are not always ensured. This makes these systems more appropriate for water points that cater to less than five households – any number larger than this, then a reservoir would be required to ensure water availability at sufficient pressure around round the clock, and also to avoid long queues during water collection.

The CBO charges the regular charge of DWASA which is BDT16.63/cubic meter including VAT from its users.

**System Operator:** It is the responsibility of CBOs to manage the service provision concerning the water distribution system within the LIC, and ensuring the upkeep of water points and tariff collection.

**System Owner:** DWASA is the legal owner of the pipe up to the point outside the LIC boundary. The CBOs are the owners of the internal piped network leading to the water points.

***Sites #3 and #4 – CBO-S Model (Model #4)***

Under the CBO-S model, either underground storage tanks or above-ground water tanks are used to provide a water supply to water points (hand pumps) that are usually shared between 5-25 households (can go above 30 households per water point in certain areas). The reservoir acts as a failsafe measure to compensate for low-pressure water supply from the utility provider or as a fallback in instances when no water supply is available from the utility's feeder line.

Installing water reservoirs in LIC areas may be difficult as the construction density in LIC areas is high, leaving little space for water reservoirs. Also, reservoirs need to be maintained (cleaned) regularly which may be difficult without external service provider

support. As a result, communities tend to suspend plans for cleaning the reservoirs, thus introducing the risk of water contamination.
The CBO charges the regular charge of DWASA which is BDT 16.63/cubic meter including VAT from its users.

The CBO-S model requires quite some land for a central above-ground larger storage tank. Hence in areas where such land is unavailable, the hand pump with underground storage solution (shown in figure 7 below) is used.

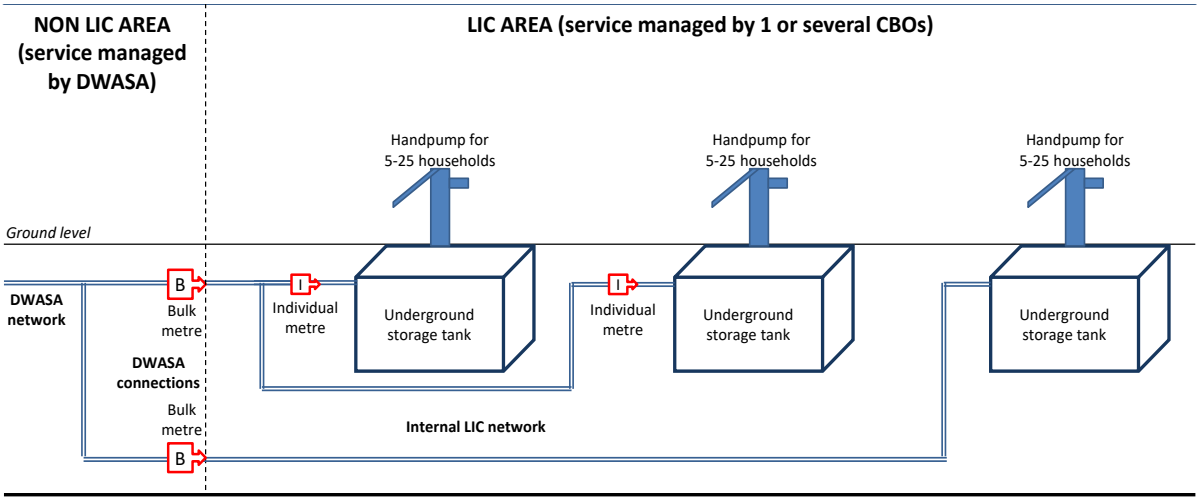



*Figure 7 CBO-S model*

**System Operator:** It is the responsibility of CBOs to manage the service provision concerning the water distribution system within the LIC, and ensuring the upkeep of water points and tariff collection.

**System Owner:** DWASA is the legal owner of the pipe up to the point outside the LIC boundary. During project period, the internal network is owned by the CBO. However, after project completion ownership of the internal LIC network is transferred to DWASA.

### *1.2.3. Social Enterprise (SE) Model (Model #5)*

In the Bhashantek LIC, the international NGO Eau et Vie (Water and Life) has established a private enterprise by the name of Shobar Jonno Pani (a Limited Liability Company, which is referred to by Eau et Vie as a social business) and an NGO called Water and Life Bangladesh[13].

Shobar Jonno Pani (SJP) is responsible for the construction and maintenance of water systems as well as the distribution of running drinking water and payment collection. This model encompasses one bulk water connection from DWASA and SJP is responsible for distribution within the LIC area under their purview. The social enterprise has household meters installed in clusters under their bulk water meter. SJP has plumbers who help their staffs to read the household meters every week to gather information regarding the water usage. Furthermore, the plumbers also perform the bulk water meter reading for preparing the bill for DWASA. Users are charged separately for water services on a monthly basis and at a significantly higher rate than conventional water charges. The water charge includes:

- Operational costs

[13] Source: Garandeau, R., 2013, Water Service Delivery Models options for LIC areas in Dhaka, Water and Sanitation for the Urban Poor (WSUP).

- Maintenance of the network
- Regular water quality tests and treatment
- Regular cleaning and flushing of the network
- Running costs of SJP branch
- Social tariff for schools, mosques, daycare centers
- Contribution to a future Community fund

For its part, the NGO Water and Life Bangladesh develops training courses on hygiene, environment, and fire prevention and aims at strengthening neighborhood committees.

Shobar Jonne Pani (SJP) started working in the Bhashantek area from 2012. At the end of 2017, the SJP and Water and Life Bangladesh officially formed their consortium and signed a contract with the European Union, AFD, and Dhaka WASA (local water operator) to connect 1,650 new households inhabiting the other half of Bhashantek to the SJP network. In 2018, the network's design was completed, and half of the main pipe was built. They have 3 underground reservoirs (40,000 Litre/tank). 2 of them are functioning. 1 is yet to be operating. The first phase of the project had been divided into 17 clusters, with each cluster having 30 or more meters. Under Phase 2, 250 households connections have been provided so far. Phase 2 of the project has been divided into 24 clusters with each cluster having the capacity of up to 90 meters. Taken together, Phase 1 and Phase 2 covers approximately 2,000 households (approximately one-third of the Bhashantek LIC) as of December 2020 and SJP plans to expand the service to all households in Bhashantek LIC in the coming years[14].

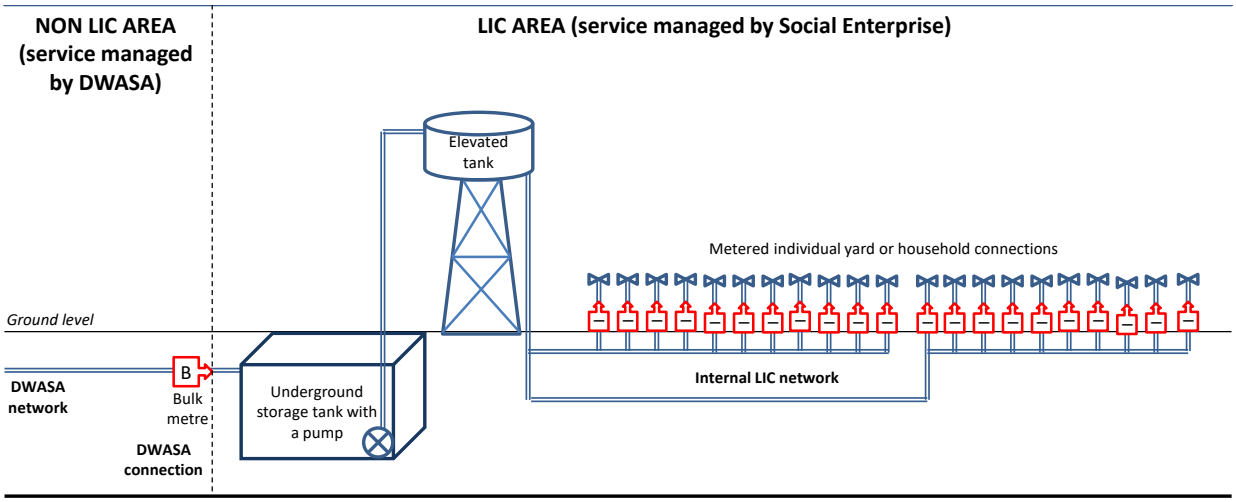



*Figure 8 Social Enterprise model*

Besides the CBO models, this example of Bhashantek is the only known legal water service social enterprise model being used within the LIC in Dhaka city. It is also the only known model where individual connections to households are provided anywhere in the LICs of Dhaka city. This will be site #5 for investigation.

The total payment SJP charge from users is 36.68 BDT for 1,000 litre. Of which, BDT 20.05 is charged as the O&M cost.

**System Operator:** It is the responsibility of SJP (social enterprise) to manage the service provision, ensuring the upkeep of water points and tariff collection.

**System Owner:** DWASA is the legal owner of the pipe up to the point outside the LIC boundary. SJP is the legal owner of the piped network within the LICs, leading to individual

[14] Source: LightCastle primary research: Interview with SJP.

households. However, this ownership may be formally handed over to DWASA at a later date.

### *1.2.4. The Water ATM Model (Models #5 and #6)*

This section outlines Water ATM/ kiosk/ vending machine model, of which we have identified two distinct business models as captured in the two models below:

***Site #6 – Non-Commercial ATM (ATM-NC) Model (Model #6)***

DSK has established three non-commercial Water ATMs in Dhaka with the funding of Oxfam and Plan International beginning around 2016/17, sourcing the hardware from a third party that supplied and installed it following a competitive bidding process. Water ATMs, called pre-paid water meters elsewhere, are water vending machines where a customer first pays for the water and then draws the prepaid volume from the water point.

The ATM-NC model operation is substantially different from the Drinkwell's ATM-C model (explained below) as the CBOs developed by DSK maintain the DSK Water ATMs. The pre-payment system is identical to the Drinkwell model (ATM-C) in that it uses tokens that can be topped-up. Technically the ATM-NC differs from the ATM-C in that it has a hand pump instead of a simple tap. The ATM has its own water treatment facility and is located away from a DWASA pump (unlike the Drinkwell setups -see below). It is understood that the CBO prices the water considerably higher than the DWASA net rates (at 0.35 BDT/liter), but this also covers the ATM operational costs (e.g., electricity and maintenance) and the salaries of a dedicated caretaker.

At the moment, out of the three installed, only the Water ATM in Robidashpara set up in 2019 with funding from Plan International in South Dhaka is operational, since the slum in Korail had burnt down and left the Water ATM non-operational and the LIC in Mohakhali was evicted. The Korail and Mohakhali Water ATMs were set up with Oxfam funding. Sajida Foundation was involved in the application and securing of the Robidashpara Water ATM license from DWASA.

The ATM charges BDT 0.35 BDT/liter of water or BDT 350/cubic meter.

**System Operator:** It is the responsibility of CBOs to operate the ATM booths.

**System Owner:** DWASA is the legal owner of the Water ATM.

***Site #7 – Commercial ATM (ATM-C) Model (Model #7)***

The most prominent example of the ATM-C model is that of the technology provider Drinkwell, which is currently assisting Dhaka WASA in order to increase safe water coverage, reduce pilferage, and decrease non-revenue water by providing turnkey solutions that offer metered dispensing of safe water through mobile money-enabled water ATM solutions. Drinkwell engages a private operator for onsite operation and maintenance of the ATM and thus assure DWASA and other utilities the provision of safe, affordable, and accessible water.


*Figure 9 User operating Drinkwell Water ATM*

Although Drinkwell had a broader ambition of establishing 300 water ATMs by September 2019, as of September 2020, according to their website[15], Drinkwell has 170 such ATM booths in operation (out of a total of 190) Dhaka city, covering both Dhaka North City Corporation (DNCC) and Dhaka South City Corporation (DSCC). Each vending machine dispenses water at BDT 0.40 per liter or BDT 400/ cubic meter.

How the Drinkwell ATM works[16]:

i. Consumers load credit onto a Drinkwell Card via either onsite payment with a local caretaker or via remote recharge facility through mobile money or dealer network.
ii. Consumers arrive at the water system site and place Drinkwell Card on the sensor once to view the credit balance and a second time to begin dispensing of water ('batch' dispensing or 'continuous' dispensing modes available).
iii. If using the 'continuous' mode, the consumer removes Drinkwell Card from the sensor to stop water dispensing. Remaining balance appears on the ATM display. The consumers can also set the quantity of water needed considering they have the required balance available in their Drinkwell card.
iv. Liters dispensed data are transmitted from the Water ATM to cloud-based IT backend via GSM connectivity and is viewable remotely on the customer's smartphone/laptop through the Drinkwell Portal.
v. Customers register with their National Identity (NID) Cards and pay a one-time deposit of BDT 200 on their top-up card.

**Technology Vendor:** Drinkwell is the technology vendor for these commercial Water ATMs.

**System Operator:** It is the responsibility of third-party operators (business enterprises) to operate the ATM booths.

**System Owner:** DWASA is the legal owner of the Water ATM.

[15] Source : Drinkwell (N.D), Utilities, Accessible at : https://drinkwellsystems.com/utilities, [Accessed on : 09.09.2020].
[16] Source: DrinkWell Systems (N.D.), Drinkwell Water ATMs, Accessed at: https://drinkwellsystems.com/water-atms, [Accessed on 09.09.2020].

# Chapter 2. **Methodology**

The desire to further improve its WASH service delivery model has led to the commissioning of this study by WOP, with the dual objectives to refine the WOP service delivery model to deliver enhanced value to its beneficiaries and to contribute to charting the way forward in LIC services provision for DWASA and its LIC partners. The report is also intended to benefit the wider LIC WASH stakeholder community in Bangladesh by offering an independent and comparative review of the various service delivery models in play.

In this endeavor, LCP has adopted a mixed-methods research approach composed of 5-phases in order to map existing service delivery models, consult stakeholders, analyze model performance and make recommendations to WASH sector stakeholders in the form of this report. The methodology adopted for performing each stage of the project stage is elaborated in the following sections:

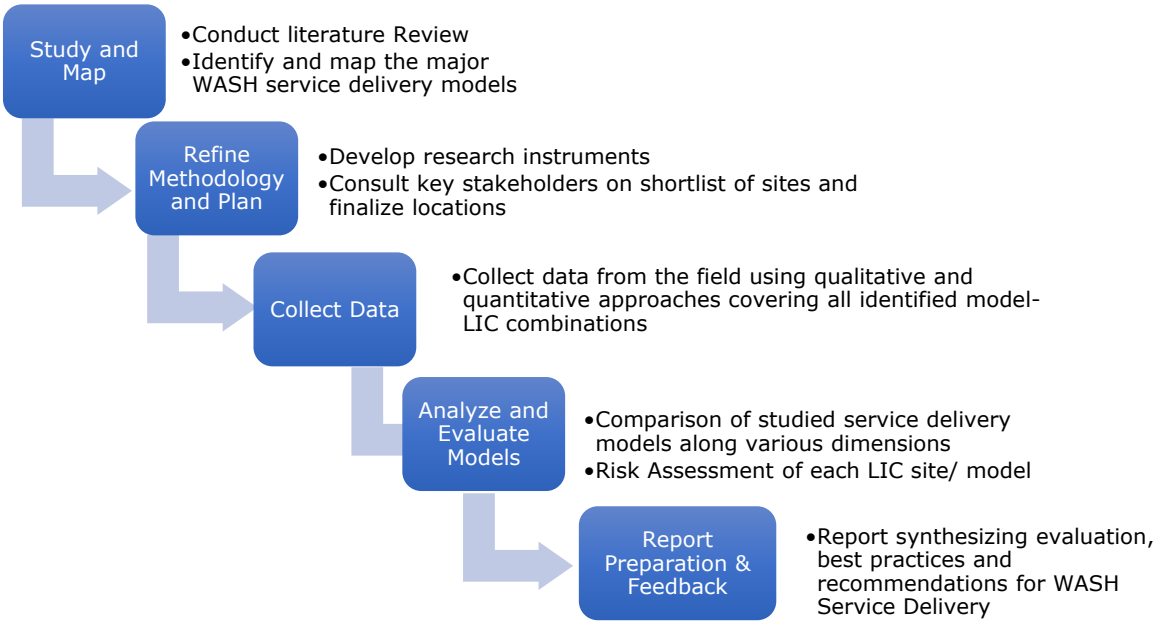



*Figure 10 5-step overview of the study methodology*

In the initial phase of this study, LCP was engaged in a thorough literature review by studying publicly available secondary material on the WASH sector of Dhaka city as they related to water service provision in LICs. Perspectives from various reports and publications from sector stakeholders such as WSUP, WaterAid and BRAC as well as status reports from the World Bank and USAID among others were studied in this initial stage to form a preliminary understanding of the WASH sector landscape and prevailing service delivery models in Dhaka city LICs. LCP was also provided access to the WOP project documents to provide further context into the rationale behind the study as well as VEI's prior understanding of the WASH sector.

Once a preliminary understanding of Dhaka city's major WASH service delivery models was developed, LCP conducted preliminary-level consultations with WASH sector stakeholders to first (a) ascertain their presence in Dhaka city LICs and (b) subsequently understand their extent of involvement in the Dhaka city's WASH sector and the water service delivery models utilized by the stakeholders. In this stage, stakeholders were consulted through short phone calls, each lasting between 10-15 minutes in duration, and

contacts database was developed through 'snowballing'. The stakeholders consulted in this preliminary phase were WaterAid, Plan International, Oxfam DSK, SAJIDA, WSUP, SNV and Practical Action. The inputs helped to form a high-level landscape map of active stakeholders and dominant service delivery models in Dhaka city LIC WASH sector.

## 2.1. WASH Service Delivery Model and LIC Site Selection Process

Having formed a preliminary understanding of Dhaka city's LIC WASH sector, the next step was to filter down to a model selection, followed by an LIC site selection process. The process for site selection is illustrated in the flow chart below:

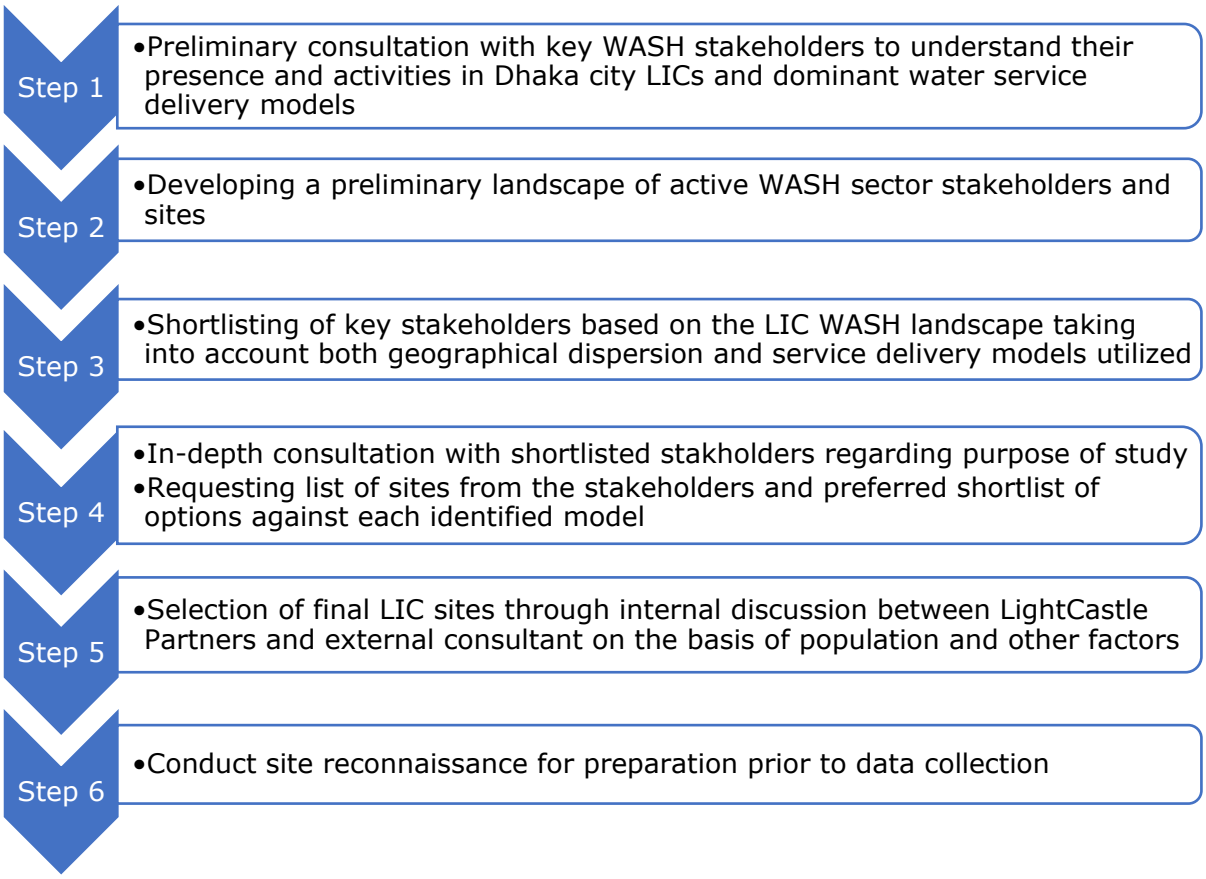



*Figure 11 Step-by-step approach to water service delivery model and LIC site selection*

Prior to site selection, it was determined in consultation with WOP, that the all the sites and models to be studied under this comparative undertaking will have to adhere to the following criteria:

- The projects must have been implemented or being implemented within Dhaka city;
- The projects must be implemented for use by LIC communities;
- The completion date of the LIC projects can only date back a maximum of 5 years from the beginning of the study (i.e. the year 2015). This was done to prevent coverage of long-completed LIC projects which may no longer be functional to an extent to be covered as an ideal model under this study;
- The size of the LIC project should preferably be 500 households or more, with a preference for LICs with higher populations;
- The implementing organizations themselves are not subject of review. If the implementation of a WASH Service Delivery Model has failed due to the (lack of) organizational capacity of the implementing organization (be it due to experience, capacity, resources or reputation, etc.), those models/projects will not be included in the comparative study.

Based on the initial consultations, the water service delivery models in Dhaka LICs were classified along two dimensions – technology factors on the one dimension and operational structure on the other dimension. The classification led to identification of the 6 major models as follows:

*Table 8 Classification of water service delivery models according to technology and operational model*

| | **Operational Structure** | | Abbreviations: |
|---|---|---|---|
| **Technology** | **Non-commercial (CBO/non-profit)** | **Commercial or for-profit** | S = Storage<br>NS = No Storage<br>ATM = Automated Teller Machines/ Water Vending Machines<br>SE = Social Enterprise<br>C = Commercial<br>NC = Non-Commercial |
| Water Points without Storage | **CBO-NS** (including both WOP and non-WOP projects) | | |
| Water Points with Storage | CBO-S | SE | |
| ATMs or Water Vending Machines | ATM-NC | ATM-C* | |

* ***Note:*** *Although the ATM-C model is meant for use by low-income households, it is not exclusively meant for use by LIC residents and its booths are not located within any LICs. Hence, the performance evaluation indicators used for assessment in this study were, in many cases, not directly applicable to the ATM-C model, since the evaluation criteria were biased towards performance in an LIC-based context. Readers should be aware that ATM-C model was included with the specific understanding that its performance would not be held to the same standards as the other LIC-based water service delivery models evaluated under this study.*

The initial consultation also helped to identify major stakeholders, which included DSK and SAJIDA as largest implementing NGOs in Dhaka North and Dhaka South respectively. In terms of active project sponsors, WaterAid and AfD were selected as potential stakeholders. Having identified the dominant players, LCP then consulted these stakeholder counterparts through detailed interviews over online conference calls to (a) brief stakeholders on the purpose of the study, and (b) request a list of sites from the stakeholders and their preferred shortlist of options against each identified model. The following table summarizes the number of operational sites, shortlisted sites and the method of selection for arriving at the final set of locations for this comparative study.

*Table 9 Selection methodology for finalizing LIC locations*

| **Model Name** | **Implementing parties** | **Initial List Received** | **Method of Selection** |
|---|---|---|---|
| WOP1-NS | VEI + DSK + Simavi | 5 sites formerly covered under WOP1 | Initial shortlisting to 2 sites (BNP Road and Haji Sobhan Road) on basis of location & best expected performance. Final selection done in favor of LIC with the larger population. |
| WOP2-NS | VEI + DSK | 4 sites currently operational under WOP2 | Initial shortlisting to 2 sites (Lalsharai Tek Para and Zamindar Bari) on basis of location & best expected performance. Final selection done in favor of LIC with the larger population. |
| CBO-NS | DSK + AFD | List of 42 sites under recently concluded and ongoing projects | Satellite Bosti & Satellite Paschimpara Bosti (adjacent to each other) selected on the basis of best expected performance and having concurrent CBO-S and CBO-NS models. |
| CBO-S | DSK + AFD | | |
| | SAJIDA + WaterAid | 11 sites currently operational | Initial shortlisting down to 2 sites (City Polli and Robidashpara) on basis of location & best expected performance. |

| Model Name | Implementing parties | Initial List Received | Method of Selection |
|---|---|---|---|
| | | under WOP2 in Dhaka South | Final selection done in favor of LIC with the larger population. |
| ATM-NC | Plan Int'l + DSK | Single site operational in Dhaka city | |
| SE | Eau et Vie + Shobar Jonno Pani (SJP) | Single site operational in Dhaka city | |
| ATM-C | Drinkwell Water | DWASA has 200 ATM-C sites across Dhaka city | Purposively shortlisted booths in Dhaka South to represent both parts of Dhaka city. Final site nominated by Drinkwell Water as perceived to be used by a larger proportion of low-income respondents and vicinity to LIC compared to other sites. |

**Note:** This study could not cover LICs located on private land because NGOs do not typically undertake projects in private LICs due to risks of eviction and uncertainty.

With the aim to conduct the comparative action research on the above-mentioned models, the 7 following sites were selected strategically keeping the number of beneficiaries, implementation of the projects and uniqueness of the models in consideration:

1. For WOP1-NS Model (Model #1), **Hazi Sobhan Road** from the WOP1 active and operational areas is selected for evaluation under this comparative study. Under the selected LIC, only non-storage water points and their stakeholders were covered. ***Project Status:*** *Completed*
2. For WOP2-NS Model (Model #1), **Zamindar Bari** under Dhamalkot-3 in Mirpur was selected for evaluation under this comparative study. ***Project Status:*** *Active*
3. For CBO-NS Model (Model #2), **Satellite Slum (both East and West LIC)** under Dhaka North was selected. It is the project site of DSK and AFD. ***Project Status:*** *Completed*
4. For CBO-S Model (Model #3), two Dhaka LIC sites from the CBO-S Model were selected for evaluation under this comparative study. The first of the sites were the same **Satellite Slum** (both East and West LIC; ***Project Status:*** *Completed*) sites under DSK and AFD implementation to better allow for comparison across a similar context. The second site selected was **City Polli** LIC (***Project Status:*** *Active*) in Dhaka South under implementation of SAJIDA Foundation.
5. For the Social Enterprise (SE) Model (Model #4), **Bhashantek** LIC site was selected for evaluation under this comparative study. ***Project Status:*** *Active*
6. For Non-Commercial ATM (ATM-NC) Model (Model #5), **Robidashpara** LIC site in Dhaka South is selected for evaluation under this comparative study. ***Project Status:*** *Completed*
7. For Commercial ATM (ATM-C) Model (Model #6), one Drinkwell Water ATM site in **Kadamtala,** which is in close vicinity of an LIC community, was selected for evaluation under this comparative study. ***Project Status:*** *Active*

The map below shows the geographical dispersion of the 7 sites across Dhaka city:

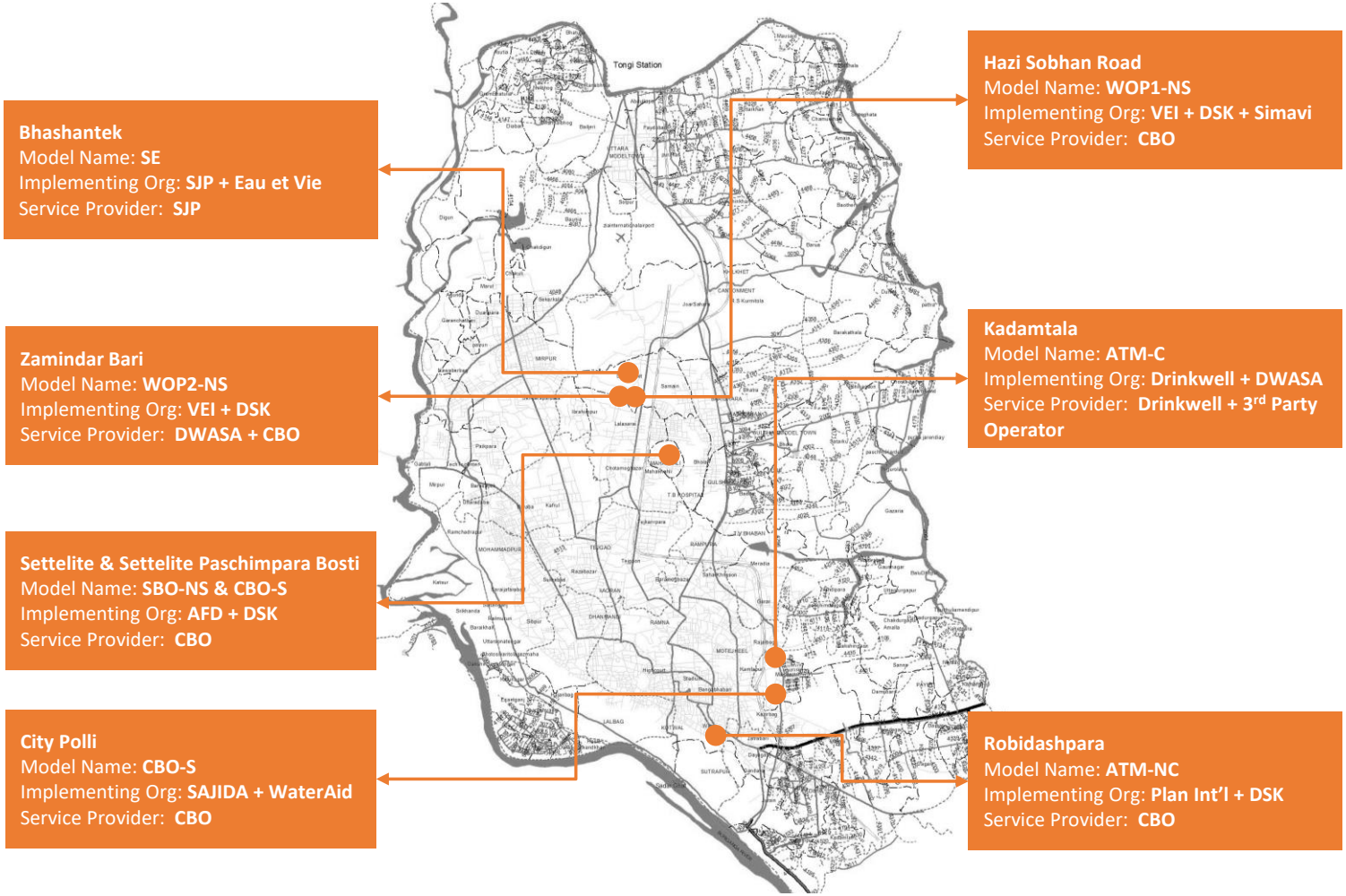



*Figure 12 Location of LIC sites investigated across Dhaka city*

The finalized sites, categorized according to the two broad dimensions - the first being the business model structure and the second dimension being the technology used for water service delivery are as follows:

*Table 10 Model identification matrix for comparative study*

| Business Model / Technology | Not for Profit | | | | | | For Profit | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Model # and name | | Implementation, ownership and management | | | No. of Sites for Investigation | Model # and name | | Implementation, ownership and management | | | No. of Sites for Investigation |
| | | | Implementing parties | System operator | System owner | | | | Implementing parties | System operator | System owner | |
| **Water Points without Storage** | 1 | WOP1-NS | VEI + DSK + Simavi | CBO | DWASA | Hazi Sobhan Road | | | | | | |
| | | WOP2-NS | VEI + DSK | DWASA + CBO | DWASA | Zamindar Bari | | | | | | |
| | 2 | CBO-NS* | DSK + AFD | CBO | DWASA | Settelite Bosti & Settelite Paschimpara Bosti | | | | | | |
| **Water Points with Storage** | 3 | CBO-S* | DSK + AFD | CBO | DWASA | | 4 | SE | Eau et Vie + Shobar Jonno Pani (SJP) | SJP | SJP | Bhashantek |
| | | CBO-S* | SAJIDA + WaterAid | CBO | DWASA | City Polli | | | | | | |
| **Water Vending Machines (ATMs)** | 5 | ATM-NC | Plan Int'l + DSK | CBO | DWASA | Robidashpara | 6 | ATM-C | Drinkwell Water | Third-Party Operator | DWASA | Kadamtala |

S = Storage
NS = No Storage
ATM = Automated Teller Machines/ Water Vending Machines
SE = Social Enterprise
C = Commercial
NC = Non-Commercial
* Note that CBOs within the model name refer to non-WOP1 or non-WOP2 CBO models only. WOP1 and WOP2 project areas also operate through the use of CBOs.

## 2.2. Sampling Plan

The project made use of a mixed-methods approach utilizing both quantitative and qualitative modes of investigation to collect primary data that formed the inputs for the evaluation conducted under this comparative study. When developing research instruments for administering during surveys and questionnaires, LCP had formulated the questions based on trigger questions developed from the modified IRC framework explained in further detail in section 2.4.

The following section elaborates on the LIC and non-LIC sampling plans:

### 2.2.1. LIC Sampling

A total of 68 randomly selected rapid beneficiary surveys were targeted to be conducted at the household level in the each of the 8 locations to explore the efficiency of operations, quality of service, beneficiary awareness, sustainability of the model and risk factors among other things. This number was derived at by applying a Confidence level of 90% and a margin of error of 10% to an average estimated population of 7,000 in each LIC – for a total sample size of 544 beneficiary surveys across the eight LIC-model combinations. In actuality, 501 surveys were conducted due to several constraints, which have been elaborated on later in this section.

Three beneficiaries were randomly selected from among the survey respondents and asked to volunteer from each of the LIC-model combinations were also consulted using in-depth interviews to form a better context and understanding of the model and beneficiaries' engagement with the service delivery model. 21 out of 21 planned beneficiary IDIs were conducted as part of the study.

In addition to beneficiaries, at the community level, the community leaders and CBOs/ model operators were also engaged using Key Informant Interviews (KIIs) for collecting additional information and triangulating information collected through beneficiary interactions. Based on nominations from either the implementing NGO or CBO/Operator, one community leader KII and one CBO/operator KII were interviewed from each of the locations (with the exception of ATM-C model, where community leaders were not applicable as the Water ATMs were not located within an LIC). In addition, the surveys interrupted the regular course of life for Water ATM users, unlike household surveys, the Water ATM surveys were significantly shortened in length to capture mainly quality of service performance and what proportion of Water ATM users were LIC residents.

The nature of the Covid-19 pandemic did not allow for the project to conduct FGDs as initially desired, due to the health risks that may arise from having multiple persons in close quarters for an extended period of time.

The table below summarizes the planned and actual modes of consultation utilized for data collection at LICs during this project.

*Table 11 Sampling plan for LIC-based primary research*

| Model | Location | Beneficiary Surveys | | Beneficiary IDI | | CBO/ Operator KII | | Community Leader KII | |
|---|---|---|---|---|---|---|---|---|---|
| | | Actual | Planned | Actual | Planned | Actual | Planned | Actual | Planned |
| CBO-S* | City Polli (only with tank) | 65 | 68 | 3 | 3 | 1 | 1 | - | 1 |
| WOP1-NS | Hazi Sobhan Road (direct line no tank) | 71 | 68 | 3 | 3 | 1 | 1 | 1 | 1 |

| Model | Location | Beneficiary Surveys | | Beneficiary IDI | | CBO/ Operator KII | | Community Leader KII | |
|---|---|---|---|---|---|---|---|---|---|
| | | Actual | Planned | Actual | Planned | Actual | Planned | Actual | Planned |
| ATM-NC | Robidashpara (Water ATM users only) | 70 | 68 | 3 | 3 | 1 | 1 | 1 | 1 |
| CBO-NS* | Settelite Bosti (direct line no tank) | 66 | 68 | 3 | 3 | 1 | 1 | 1 | 1 |
| CBO-S* | Settelite Bosti (with tank) | 73 | 68 | 3 | 3 | 1 | 1 | 1 | 1 |
| WOP2-NS | Zamindar Bari (direct line no tank) | 69 | 68 | 3 | 3 | 1* | 1 | 1* | 1 |
| SE | Bhashantek (direct line to house) | 14 | 68 | 3 | 3 | 1 | 1 | - | 1 |
| ATM-C | Kadamtala Water ATM | 73 | 68 | - | - | 1 | 1 | - | 1 |
| Total | | 501 | 544 | 21 | 21 | 8 | 8 | 5 | 8 |

* Due to schedule restrictions, in the case of Zamindar Bari (WOP2-NS) LCP concurrently held CBO KII and community leader KII in the same sitting.

As illustrated in the table above, there were some constraints faced in reaching the targeted allotment of samples across three LICs:

- ***Bhashantek Social Enterprise:***

Past difficulties in conducting similar large-scale household surveys in Bhasthantek had faced opposition from certain local political groups. To avoid an undesirable situation, following recommendations of the service operator Shobar Jonno Pani (SJP), surveys in Bhashantek LIC were conducted on a very limited scale within the SJP office premises with only 14 beneficiaries surveyed, who also were also staff of SJP. A small subset of these respondents was also consulted for the In-depth interviews (IDI) following survey administration. Given the mode of consultation, it was not was not possible to conduct an interview with a community leader at Bhashantek LIC.

- ***Kadamtala ATM-C:***

Unlike other sites examined under this comparative study, the Water ATM machines were not located within LICs and it was not possible to pre-determine what proportion of users of the Water ATMs were LIC residents. Therefore, it was not possible to survey users at their household and the interviews with community leaders also had to be foregone.

Moreover, the users of the Water ATM were making use of a vending machine to avail a quick service, hence it was recognized that the typical 15-20-minute surveys designed for administering at the household levels would not be suitable for administering in the Water ATM. Due to this constraint, a shorter 5-8-minute version of the surveys collecting essential data designed to analyze what proportion of service users were LIC residents and the quality of service, was administered instead.

- ***City Polli LIC***

Due to unavailability of a suitable City Polli LIC community leader at the time of survey, no community leader KII was conducted at the site.

### 3.2.2. Non-LIC Sampling

The landscape mapping exercise of the study conducted during the initial stage of the project helped in developing a clear idea of the functional breadth of the services of the different NGOs, donors and WASH sector stakeholders who are delivering WASH services to LICs in Dhaka city. Based on the developed landscape map, LCP determined four NGOs, namely DSK, SAJIDA Foundation, WaterAid, and Water and Life as essential to be consulted through Key Informant Interviews for the purpose of this study.

In addition, the important of DWASA as a singular key sector stakeholder warranted consultations at multiple levels of DWASA and with a breadth of different respondents. Considering the need to explore vertically up the organizational hierarchy to account for the differences in functionality, LCP decided to cover interviews with three engineering levels (namely Superintending Engineer, Executive Engineer, Sub-Asst. Engineer) and one interview with the authority in charge of LICs in Dhaka (Senior Community Officer and Divisional Head of the Community Program and Consumer Relation Division Unit). Given that a lot of the DWASA functions were segregated on a zonal basis, it was also felt important to consult different actors representing two zones, one from the North side, MODS Zone 10, and one from the South side of Dhaka city (MODS Zone 1).

A total of 8 interviews were conducted with six respondents from DWASA and 4 respondents from the NGOs, as shown in the table below.

The following table outlines the non-LIC stakeholders consulted under this study:

| Interview # | Respondent | Mode of Consultation |
|---|---|---|
| 1 | Superintending Engineer of DWASA | Online call |
| 2 | • Executive Engineer<br>• Sub-Asst. Engineer<br><br>of MODS ZONE 10 (Dhaka North)*, DWASA | In-person Interview |
| 3 | • Executive Engineer<br>• Sub-Asst. Engineer<br><br>of MODS ZONE 1 (Dhaka South) *, DWASA | Online call |
| 4 | Senior Community Officer (SCO) & Divisional Head, Community Program and Consumer Relation (CPCR) Division, DWASA | In-person Interview |
| 5 | WaterAid | Online call |
| 6 | Water and Life | Online call |
| 7 | DSK | Online call |
| 8 | SAJIDA | Online call |

*Table 12 List of Non-LIC-based Interviews*

*Interviews with Executive Engineers and Sub-Asst. Engineer interviews have been conducted together in one sitting for each zone.

## 2.3. Data Collection Methodology

The LIC-level data collection was conducted over a period of 7 consecutive days between 15th September and 21st of September.

### 2.3.1. Team Composition

A team of 13 members were mobilized during the data collection process:

| Position within team | # of | Roles & Responsibilities |
|---|---|---|
| Field Coordinator | 1 | • Coordinating with site stakeholders (NGOs, CBOs/operators and community leaders)<br>• Supervising teams of enumerators<br>• Conducting KII with CBOs/operators and community leaders |
| Team Supervisor | 1 | • Supervising teams of enumerators<br>• Conducting IDI with beneficiaries |
| Enumerator | 11 | • Conducting Household Surveys |
| | 13 Team members in total | |

*Table 13 Field Team Composition and Roles and Responsibilities*

55% of enumerators (6 out of 11) chosen for the study were females, as it was felt that since the majority of survey respondents would be female, most female respondents would feel more comfortable being surveyed by a female enumerator. A number of male enumerators was also on the team to ensure a level of physical safety of the female respondents. All respondents were trained in digital data collection and oriented on the context of the project and LIC water service delivery modalities prior to being mobilized in the filed for data collection.

### 2.3.2. Household Surveys

The process of household survey administration and subsequent quality assurance process was completed in a five-step process, as follows:

- ***Step 1 – Scheduling and Permissions:***

Within the specified data collection period, dates for household survey and interviews set in consultation with the operator/CBO. The data collection process was structured so that surveys and interviews across each site were covered within 1-2 days.

As a matter of protocol, permission generally has to be sought from the relevant authorities before conducting the assessment, which also serves as evidence of authority when conducting data collection. In the case of this project, an authorization letter signed by the Superintending Engineer, MODS Circle-2, DWASA and Coordinator, WOP and countersigned by VEI was obtained to represent approval from project sponsors.

- ***Step 2 – Water Point Identification at LIC:***

When conducting data collection process, teams moved as a whole to each LIC covered under this study. Only in the case of the ATM-C model, a pair of enumerators was assigned to administer surveys.

At LICs, the data collection team, with the help of CBOs/operators identified which water points were covered by the water supply delivery service being examined and as

necessary, sought assistance of the CBOs/operators to locate the clusters of households which are users of the CBO service.

- ***Step 3 – Team dispersion for surveys:***

Within the LIC, it was realized that the sample size of 68 should be distributed well across various points across the LIC to ensure that the entire LIC area is covered and for making sure that the sampling distribution is representative of the LIC selected. For this purpose, the team of enumerators were split into 5 pairs (pairing male and female enumerators for physical security) and were assigned to different portions of the LIC centering different water points in five dispersed locations (four corners and central area of the LIC) to get a representative sample of the entire LIC.

- ***Step 4 – Systematic Random Sampling:***

Within each pair of enumerators, male and female enumerators cover different households for surveys. Within LICs, households typically rent one or two rooms depending on the size of the family and rooms are often arranged in "clusters" or small lanes with rooms on either side. In larger LICs, enumerators were asked to avoid to taking responses from multiple households in a single cluster, but in smaller this was not possible. Team members conducted surveys using systematic random sampling, intentionally avoiding covering families in close proximity to each other, and skipping three rooms before moving onto the next room when in the same cluster.

- ***Step 4 – Conducting Surveys***

It took approximately 15-20 minutes to conduct a survey with one household. On average, 7 household surveys were assigned to each enumerator per day. The surveys were captured electronically using LCP's custom data collection platform using personal smartphones or tablet devices.

In addition to their supervising roles, the team supervisors conducted three beneficiary IDIs and the field coordinator was tasked to conduct one KII with the CBO/operator and another KII with the community leader on a daily basis.

**Health and Safety Considerations:** As the surveys were conducted in the midst of the Covid pandemic, all enumerators were provided with protective gear, including personal protective suits, masks, hand sanitizer and gloves. Enumerators were also instructed to keep at least a 1m distance from respondents and to take surveys in open, well-ventilated spaces, where possible. Prior to and during data collection, daily temperature checks of enumerators were also performed.

- ***Step 5 – Data Quality Assurance***

Following data collection, all submitted data was first checked for completeness prior to approval. Incomplete datasets were either filled in by calling up beneficiaries using their provided cellphone numbers or otherwise rejected, where contact detail was not available or the beneficiary was unreachable. To ensure further quality assurance, 40 household survey data (approximately 8% of total) were validated using phone calls to data authenticity taking an equal number of samples from each enumerator. No issues or mismatches were found between the survey data and data from beneficiary phone validation interviews.

### *2.3.3. Interviews*

Interviews conducted within LICs were conducted in-person keeping the same health and safety precautions, as elaborated above, in mind. For non-LIC Interviews, mainly with

WASH sector stakeholders and DWASA, most of the interviews were conducted over online conference calls, while a small proportion was conducted or in-person. Interviews with beneficiaries, CBOs and community leaders generally ranged from 30 minutes up to 1 hour. Interviews with WASH sector stakeholders and DWASA generally ranged from 45 minutes up to 2 hours.

Notes taken during the interview were transcribed for the purpose of using in this study.

### 2.3.4. Datasets for Report Preparation

At the end of the data collection, the project team was left with the following datasets for report preparation:

- Transcribed notes from the interviews with LIC and non-LIC stakeholders;
- Completed digital household questionnaires;
- Completed digital ATM-C Water ATM questionnaires; and
- Fieldwork photographs.

Following all survey data approval process, data was then cleaned and processed for analysis. Data analysis was conducted on the digitized survey data using Microsoft Excel, and the findings were used for generating inferences for use in this report.

## 2.4. Evaluation Framework for Comparing WASH Service Delivery Models

For the evaluation of service delivery models, it was chosen to adopt and adapt the framework developed under the Triple-S initiative by IRC and Aguaconsult, originally developed at the request of USAID, and draws on aspects of a similar tool developed by AGUASAN with funding from the Swiss Development Corporation. The tool is very flexible in terms of application, ranging from a quick 'brainstorm' type approach or through a highly structured workshop or through a formal study such as this. It is also a well-known framework that is on par in terms of recognition within the development sector in comparison to other major alternatives (such as the FIETS model developed by the Dutch WASH Alliance).

The IRC Framework had been designed specifically to provide a better understanding of programme design, priorities and decision-making within the context of the sector level as opposed to individual project level, as well as identifying key weaknesses or bottlenecks, which appealed to the project-agnostic, business model-specific nature of this comparative study.

The true strength of the IRC model lies in its versatility. The developers of this framework had clearly stated that this tool is not fully finalized and some of the indicators require refinement. It is explicitly intended as a framework for general guidance, and according to its developers, could be modified to fit the country context. They have highlighted that assessments across various countries will be unique and may require the investigation of complementary areas depending on the sector, the history of decentralization and the level of aid dependency.

The original IRC framework scores each initiative across eight different areas, namely policy, legislation and institutions, financing, planning, transparency and accountability, capacity, sector learning and knowledge management, harmonization and alignment, and environment. Each area has a number of indicators: policy, legislation and institutions (5 indicators), financing (2 indicators), planning (3 indicators), transparency and accountability (3 indicators), capacity (2 indicators), sector learning and knowledge management (1 indicator), harmonization and alignment (2 indicators), and environment

(1 indicator). Three or four guiding questions or "trigger" questions help the respondent determine a single score, from 0 to 100, for each indicator. Indicator scores are averaged for a score across a single dimension.

Given that this comparative study also needed to take into account the site-specific or organization-specific contexts of a particular water service delivery model, it was determined that the IRC Model should be modified to accommodate these site-specific and organization-specific factors.

*Table 14 Adaptation of the IRC Framework*

| | | |
|---|---|---|
| **1. Policy, legislation & institutions**<br>1.1 Sector reform and institutional mandates<br>1.2 Service Delivery Models<br>1.3 Professionalisation of community management<br>1.4 Regulation of rural services and service providers<br>1.5 Technology | Adapted To | **1. Policy, legislation and institutions**<br>**1.1.** Sector policies and stakeholder mandates<br>**1.2.** Service delivery models<br>**1.3.** Professionalisation of community management<br>**1.4.** Regulation of service providers<br>**1.5.** Technology |
| **2. Financing for full life-cycle costs**<br>2.1 Financial planning to cover all life-cycle costs<br>2.2 Asset management | | **2. Financing for life-cycle costs**<br>**2.1.** Financial planning to cover all life-cycle costs<br>**2.2.** Asset management |
| **3. Planning**<br>3.1 Scaled up service provision<br>3.2 Inclusivity<br>3.3 Multiple Use Systems | | **3. Planning**<br>**3.1.** Scaled up service provision<br>**3.2.** Inclusivity<br>**3.3.** Multiple water needs and sources |
| **4. Transparency & accountability**<br>4.1 Monitoring for service delivery<br>4.2 Accountability & civil society<br>4.3 Corruption | | **4. Transparency and accountability**<br>**4.1.** Monitoring for services delivery<br>**4.2.** Accountability and civil society<br>**4.3.** Corruption |
| **5. Capacity**<br>5.1 Post-construction or recurrent direct support<br>5.2 Capacity support to local government (service authorities) | | **5. Capacity**<br>**5.1.** Capacity support to the water services providers<br>**5.2.** Capacity support to the service authority (DWASA) |
| **6. Sector learning & Knowledge Management**<br>6.1 Sector learning & Knowledge Management | | **6. Learning and knowledge management**<br>**6.1.** Learning and knowledge management |
| **7. Harmonisation & alignment**<br>7.1 Harmonisation & alignment<br>7.2 Coordination | | **7. Harmonisation and alignment**<br>**7.1.** Harmonisation and alignment<br>**7.2.** Collaboration and coordination |
| **8. Environment**<br>8.1 Environment | | **8. Environment**<br>**8.1.** Environment |
| | | **9. Quality of service**<br>**9.1.** Water quality and sufficiency<br>**9.2.** Continuity and equitable service delivery<br>**9.3.** Acceptability and affordability<br>**9.4.** Supply interruptions |

As can be seen from Table 10, most of the eight original dimensions and their constituent indicators remain unchanged. However, there have been extensive changes made to the definition of said indicators, their guiding questions or "trigger" questions and the scoring rubric for arriving at a score for each of the indicators. In addition, the modified IRC framework also incorporates a ninth dimension - "Quality of Service" - to compare performance-related parameters and functional efficiency between the identified models.

Table 15 below provides a definition of the additional indicators under the newly introduced "Quality of Service" dimension.

*Table 15 Additional indictors under new Quality of Service dimension*

| Quality of service Indicator | Definition |
|---|---|
| **Indicator 9.1:** Water quality and sufficiency | This indicator is designed to evaluate whether the water provided in the LIC is clear, odourless, tastes well and is used for drinking and other purposes; and whether water is available in the required quantity. |
| **Indicator 9.2:** Continuity and equitable service delivery | Designed to evaluate whether water provided in the LIC is available throughout the day (24/7) and is available in equal measure to all LIC residents. |
| **Indicator 9.3:** Acceptability and affordability | Designed to measure whether water supply system provided to the LIC residents is acceptable to them, and what proportion of residents can afford to pay the related charges. |
| **Indicator 9.4:** Supply interruptions | This indicator explores the severity in terms of beneficiary impact and strength of the response in the case of supply interruption events, whether they be caused through an internal (LIC) network issue or through issues in the greater DWASA network. |

The modified line of investigation i.e. guiding/trigger question and scoring rubric under each of the dimensions and underlying indicators can be found in Annex 2. Once the IRC framework was modified to suit the needs of this comparative study, the framework indicators were mapped against the target audience groups intended for consultation during primary research as shown in Table 11 below.

*Table 16 Mapping indicators to audience groups*

| Indicator | Audience | | | | | |
|---|---|---|---|---|---|---|
| | LIC Resident Surveys | LIC Resident IDIs | Community Leaders KII | Service Providers/ CBO KII | NGOs KII | DWASA KII |
| **1. Policy, legislation and institutions** | | | | | | |
| **1.1.** Sector policies and stakeholder mandates | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| **1.2.** Service delivery models | | ✓ | ✓ | | ✓ | ✓ |
| **1.3.** Professionalisation of community management | | ✓ | ✓ | ✓ | ✓ | ✓ |
| **1.4.** Regulation of service providers | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| **1.5.** Technology | | ✓ | ✓ | ✓ | ✓ | ✓ |
| | | | | | | |
| **2. Financing for life-cycle costs** | | | | | | |
| **2.1.** Financial planning to cover all life-cycle costs | | ✓ | ✓ | ✓ | ✓ | ✓ |
| **2.2.** Asset management | | | ✓ | ✓ | ✓ | ✓ |
| | | | | | | |
| **3. Planning** | | | | | | |
| **3.1.** Scaled up service provision | | | ✓ | ✓ | ✓ | ✓ |
| **3.2.** Inclusivity | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| **3.3.** Multiple water needs and sources | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | | | | | | |
| **4. Transparency and accountability** | | | | | | |
| **4.1.** Monitoring for services delivery | | | ✓ | ✓ | ✓ | ✓ |
| **4.2.** Accountability and civil society | ✓ | ✓ | ✓ | ✓ | ✓ | |
| **4.3.** Corruption | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | | | | | | |
| **5. Capacity** | | | | | | |
| **5.1.** Capacity support to the water services providers | | | ✓ | ✓ | ✓ | ✓ |
| **5.2.** Capacity support to the service authority (DWASA) | | | | ✓ | ✓ | ✓ |
| | | | | | | |
| **6. Learning and knowledge management** | | | | | | |
| **6.1.** Learning and knowledge management | | ✓ | ✓ | ✓ | ✓ | ✓ |
| | | | | | | |
| **7. Harmonisation and alignment** | | | | | | |
| **7.1.** Harmonisation and alignment | | | | ✓ | ✓ | ✓ |
| **7.2.** Collaboration and coordination | | | ✓ | ✓ | ✓ | ✓ |
| | | | | | | |
| **8. Environment** | | | | | | |
| **8.1.** Environment | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | | | | | | |
| **9. Quality of service** | | | | | | |
| **9.1.** Water quality and sufficiency | ✓ | ✓ | ✓ | | ✓ | ✓ |
| **9.2.** Continuity and equitable service delivery | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| **9.3.** Acceptability and affordability | ✓ | ✓ | ✓ | | ✓ | |
| **9.4.** Supply interruptions | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

Following this exercise, the underlying trigger questions relating to each of the indicators was extracted and adapted for inclusion within the relevant research instrument for that particular audience group.

## 2.5. Risk Assessment Framework

In addition to performance measurement across the defined dimensions of the evaluation framework, the study also encompasses a risk assessment of each model covering multiple risk categories. The purpose of this risk assessment process is to identify potential risks relating to each model-LIC combination, to establish the probability and the impact of risk occurrence, and where possible, to define a risk mitigation strategy, if required and to identify the actor to undertake the mitigation.

For the risk assessment framework, the following risk definitions and risk framework, as shown below in Tables 12 and 13, were used.

*Table 17 Risk categorization table*

| **1. Political Risk** | **5. Commercial Risk** |
|---|---|
| • Legislative (e.g., Water Law) | • Inadequate billing |
| • Political opposition and/or Political change | • Non-enforceability of coercive measures for non-payment of water bills |
| • Political interference | • Concentration of large customers |
| • Institutional restructuring | • Non-payment of bonded clients/customers |
| • Civil unrest | • Billing efficiency |
| **2. Regulatory Risk** | **6. Financial Risk** |
| • Compliance with DWASA regulations, fees, corporate governance guidelines | • Non-mobilization of commercial debt on the merits of the service delivery model |
| • Compliance with quality standards | • Limited donor funds |
| • New Water Law | • Disbursement risk |
| • Compliance with constitutional requirements | • Disbursement lag risk |
| | • High interest rates |
| **3. Investment Risk** | • Liquidity risk |
| • Preparation – faulty design | • Increase in operations and maintenance costs |
| • Preparation – site availability | • Inflation- lower purchasing power from customers |
| • Construction – site conditions | • Revenue collection efficiency - water supplied on credit |
| • Construction – site permits | **7. Tariff Risk** |
| • Construction liability risk | • Non-adequacy of tariff level & structure |
| • Construction – subcontract failure | • High inflation - lower purchasing power- operator unable to meet O&M costs with current tariffs |
| • Construction – cost overruns / penalties | • Adverse political influence – tariff review |
| • Construction delays – loss of revenue | |
| • Contractor bankruptcy | |
| • Long term viability of investment decision | |
| **4. Operational Risk** | **8. Environmental and Social Risks** |
| | |
| • Demand risk – loss of revenue | • Non-compliance with environmental guidelines |
| • Demand vs Supply- insufficient capacity | • Lack of climate resilience |
| • Service availability – condition of existing fixed assets | • Inadequate use of technology |
| • Availability of supply conditions (power, chemicals) | • Lack of social connection policy |
| • Compatibility of assets condition with performance targets | |
| • NRW | |
| • Inadequate control of OPEX | |
| • Safety - Water Contamination | |
| • Vandalism | |

The risks have been categorized according to a qualitative impact-probability matrix as shown below:

*Table 18 Risk scoring and score rating classification*

| **Risk Assessment** | | | | | | | **Risk Management** | |
|---|---|---|---|---|---|---|---|---|
| | | | **Probability** | | | | **Score** | **Risk management strategy** |
| | | | **High** | **Medium** | **Low** | | 9 | Rethink project viability |
| | | | **3** | **2** | **1** | | 6 | Mitigation Plan Needed |
| **Impact** | **High** | 3 | 9 | 6 | 3 | | 3 to 4 | Review and address |
| | **Medium** | 2 | 6 | 4 | 2 | | 2 | Monitor |
| | **Low** | 1 | 3 | 2 | 1 | | 1 | Accept and Ignore |

| Risk Rating | Low<br>Average rating ≤ 3 | Medium<br>3 < Average rating < 6 | High<br>Average rating ≥ 6 |
|---|---|---|---|

For the sake of consistency, a uniform long list of risks has been identified, which have been applied across all the model-LIC combinations for risk assessment. Once risks have been categorized and their ratings calculated, the total risk scores pertaining to each risk category have been tallied and compared across the model-LIC combinations to identify model-specific or LIC-specific variances in risk exposure across the identified risk categories.

# Chapter 3. Evaluation of Service Delivery Models

## 3.1. WOP1-NS (Non-storage) Model: Hazi Sobhan Road

### 3.1.1. General observations:

Hazi Sobhan Road is located in Mirpur, in the northern end of Dhaka. Mirpur is a residential area that includes mostly middle and lower-middle income apartment housing as well as numerous LICs. The Hazi Sobhan Road LIC was selected owing to its large number of residents of around 15,000 people and considering the relatively longer duration of the WOP1 project WASH initiative in this area compared to other WOP1 intervened locations. The total number of respondents surveyed from Hazi Sobhan Road LIC was 71. The respondents were mostly female, accounting for 75%, while males numbered 25%. Among the total respondents, tenants occupied the larger share of 54% and landowners being 46%. Only 2% of the total respondents identified as physically disabled and/or belonging to a religious minority group.

*Figure 13 WOP1-NS Model: Hazi Sobhan Road Water Point*

DSK started operating in the LIC around 2009 by setting up a CBO. The CBO was responsible for multiple operations that were undertaken for the development of the LIC. The CBO came together for the WOP1 project around 2011-12. The CBO in Hazi Sobhan Road is formed of 15 members in total (1 President, 2 Secretaries, 1 Vice-president, 2 Cashiers and 9 members). The water points are managed by an operator from DWASA and stays off between 12 am to 4 am.

### 3.1.2. Dimensions of the Assessment system

The WOP1-NS model achieves its highest scores from along the *Environment* dimension. Since the project is spearheaded by an NGO with donor funding, the project had clearly made reasonable attempts to take into consideration social and environmental factors prior to establishing a line, and also made outreach efforts to the LIC residents on the choice of technology.

It also scores moderately high along the *Learning and Knowledge Management*, *Policy, legislation and institutions*, and the *Harmonization and alignment* dimensions. The reasons for scoring high in these dimensions are thanks to its adoption of the widely used CBO model, which has a considerable existing knowledge base regarding the service provisions, stakeholder landscape and an active knowledge exchange platform such as conference sessions or information dissemination sessions to draw on. The model scored a moderate score in terms of *Quality of service* owing to cleaner water supply during most hours of

the day. From the perspective of long-term sustainability, it is also beneficial that CBO-led models are clearly the most favored approach of DWASA for reaching LIC communities.

The lowest scores the model achieves are in the *Financing for life-cycle costs* dimension, which can be attributed to the low accumulated capital expenditure fund, which is commonly seen in post-completion of WASH projects in LICs of Dhaka, raising questions about sustained and adequately-financed continuation of operations.

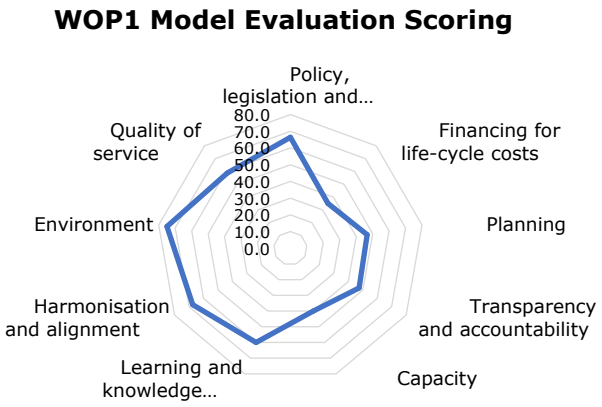



*Figure 14 WOP1 Model Evaluation Scoring*

***Policy, legislation and institutions – Score 66.4/100***

Although two thirds (68%) of LIC users indicated that they were clear about what level of services to expect from the CBO, this was expressed in non-technical terms such as "good quality", "clean" or "always available" water service - this is to be expected since the CBO does not have an official charter for LIC residents promising a certain specification of water quality, which limited service professionalization due to not having a set of specifications against which water quality and the performance of the CBO could be measured and benchmarked. CBOs, on the other hand, seemed clear on their roles and responsibilities partly due to the relatively long period of time they have been operational and no doubt benefiting from the presence of multiple NGOs in the location. Despite this, approximately 46% of respondents believed that the CBO was either not qualified for their role or did not have the proficiency needed for performing certain tasks.

On the selection of water service technology, 36% of respondents suggested that they were either not consulted on technology or not were not aware of any consultation events - this suggests that the donors, NGOs and CBOs had a greater decision-making power in regards to service model selection. The use of informal complaint mechanisms, although utilized by the LIC residents, limited the service professionalization as it was not formally documented.

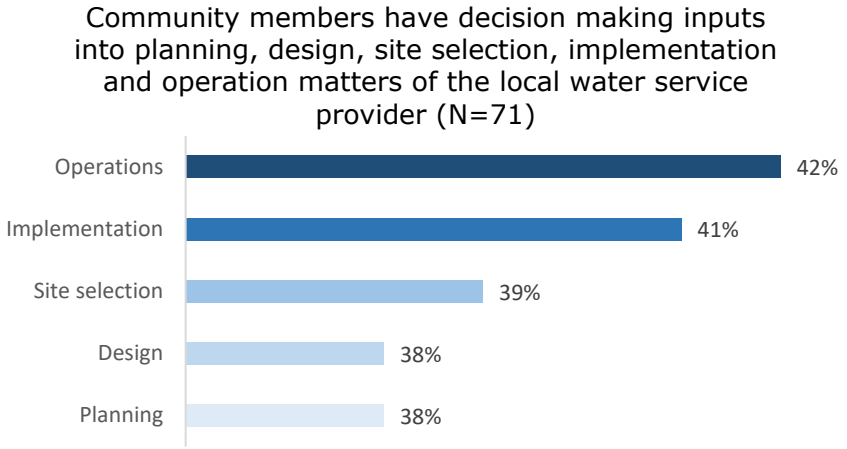



*Figure 15 WOP1-NS Community Input in Decision Making*

Under the WOP1 model, DWASA offers full recognition and empowers CBOs to legally represent and take up community water points in LICs. Although there is a formal written application from the CBO to the DWASA for line setup, there are no direct service contract or service level agreement between DWASA and the particular CBO. Regarding the technology to be used, DWASA only recommends the generic components to be used for establishing connection to the piped network but does not have any written guidelines or informal suggestions for the water point hardware.

***Financing for life-cycle costs – Score 35/100***

The majority (75%) of the respondents stated that they do not pay separately for the operation and maintenance fund for the water point, 20% mentioned that they can pay for the fund on a regular basis, while the rest of them could not afford to pay any money for the fund. There is no set/well-structured mechanism in place to provide finance for the Capital Expenditure (CAPEX). Furthermore, the water point has not required any maintenance so far after setting up the water point. According to the interview with CBO, operational expenditure is not assessed and the maintenance fund would, if so, required be arranged on an arbitrary basis. Moreover, whenever they run out of the Operation and Management (O&M) fund, they collect money in an ad-hoc basis.

Additionally, the CBO mentioned there is a small asset management fund, though, there is high dependence on urgent contributions from stakeholders such as NGO and landowners without which there could be a disruption in service. Lastly, according to the interview with LIC residents, there is an informal consumer complaint system in place, however, it is not very effective as only 12% of the respondents mentioned that the mechanism deals with all the issues.

***Planning – Score 46.7/100***

According to the CBO, before bringing in new water connections or any new project, the project is pre-discussed with the members of the society. Their opinions are taken into consideration and reached to an agreement before proceeding. The respondents mentioned, before finalizing the location and/or type of the water point for the LIC, only 46% of them were consulted to give their opinion. It should be noted here that most LIC population across Dhaka are not stable, with tenants moving from place to place due to changes in employment and lifestyle etc., which is why most CBO models rely on landowner representation in CBOs. The residents also mentioned that the landowners act as the representatives of the tenants in making input into the decision-making process during their interviews. Mostly, opinions are taken from the community leaders who act as the representatives of the community.

Majority of the LIC respondents (97%) use the water from the service provider for household purposes and as a means of drinking water. Only 3% of them use other sources of water to satisfy their demand for water. However, as per the interview with the CBO and the residents, no assessment or survey was conducted prior to the project which would identify the scopes of using water from this water system.

Even though, there are multiple water sources available in the area, they are not extensively used by the respondents, who were primarily users of the legal water service provided by the CBO. Furthermore, according to majority (87%) of the respondents the water points are accessible for all, however, the remaining 13% mentioned that it is not accessible or user-friendly for women or children and/or disabled or other disadvantaged groups. It is to be noted that, according to the residents, no awareness raising campaign regarding hygiene practices and menstruation has been conducted in the area in the last one year.

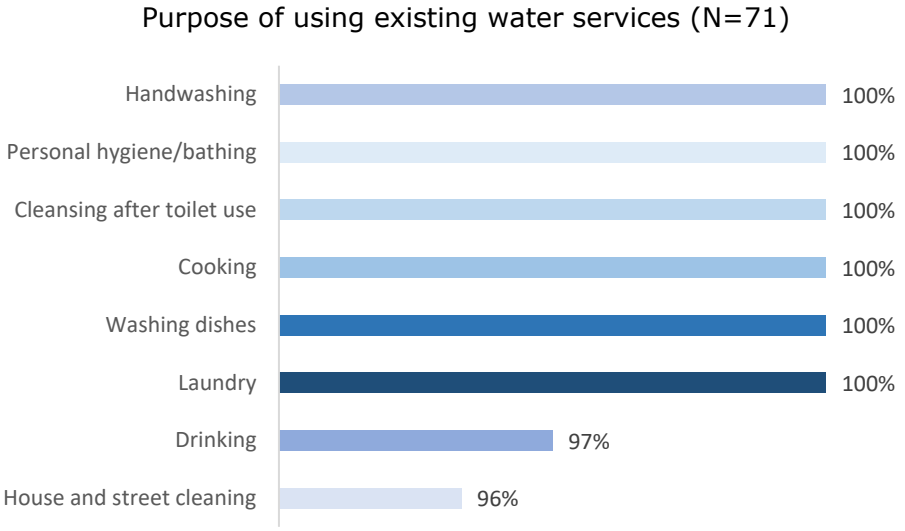



*Figure 16 WOP1 Purpose of Using Water Services*

***Transparency and accountability – Score 47.5/100***

The interview with CBO highlighted that, the services provided by the CBO are not monitored regularly or against any standard. Even if they are looked over by a CBO representative, there has been little to no evidence of any corrective action taken in order to resolve the issues identified.

Only 15% of the LIC respondents are aware of the information (procurement, financial, etc.) provided by the CBO, while the rest were unaware. The CBO does not share any performance related or financial information with the community. Furthermore, it has been mentioned by the residents and the CBO leader that information regarding the services/functionality of the LIC water services has been collected, however, they were not made available to the community. According to DSK, DSK has to abide by the water quality protocol for the projects funded by WaterAid. The water sample is tested for fecal coliform before handing over the project. Monitoring test was practiced every three months until the handover.

If anything goes wrong in the water supply, the tenants first raise the issue to the landowners and the landowners takes those issues to the CBO committee members. Sometimes the tenants take such issues to the CBO committee members directly. The CBO then works on fixing the problem or carries it forward to DWASA. The LIC residents stated that there is an informal consumer complaint system in place, however, it is not very effective. Additionally, according to the beneficiaries, DWASA has not been very responsive to their complaints.

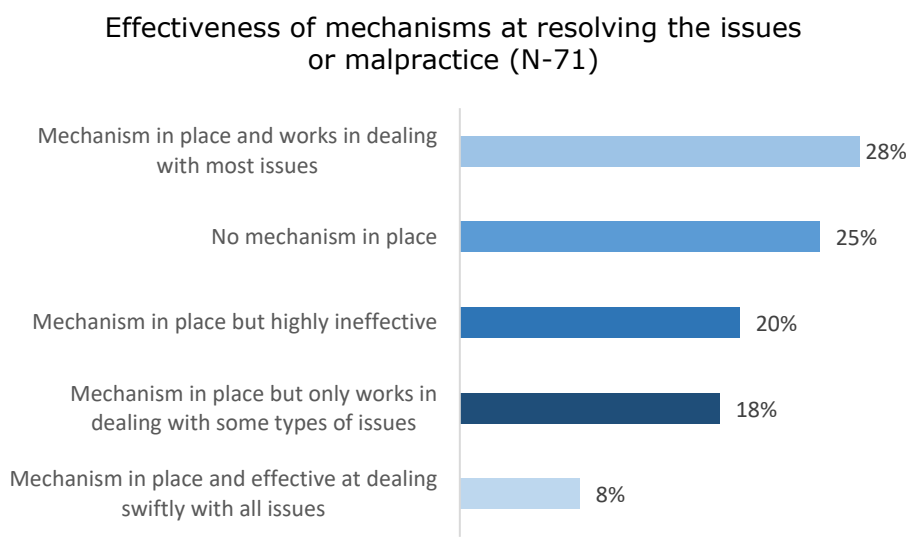



*Figure 17 WOP1 Effectiveness of Complaint Mechanism*

***Capacity – Score 40/100***

DSK had provided training to CBO members on how to operate the hand pump and manage the water points, including operation and maintenance aspects. However, the training curriculum was not based on any formal capacity needs assessment of the Hazi Sobhan road CBO and these trainings - if held more than once at all - are conducted infrequently. Due to the lack of a legal contract or service level agreement, capacity development and training responsibilities were therefore not enshrined formally. DWASA, although present at the training sessions led by DSK, had not held any training sessions for the CBO and neither had any plans or budget provisions to this end. Overall, these factors are thought to have contributed to 39% beneficiaries indicating that the CBO had proficiency for only conducting certain tasks and 7% who thought the CBO was unqualified for their roles completely.

The Hazi Sobhan Road LIC does however benefit from being a part of multiple interventions - for example, management of toilets in addition to water supply - taken on under the CBO leadership, making it more likely for continued training of the CBO.

***Learning and knowledge management – Score CBO-(60)/100***

Interviews with DSK and the DWASA MODS Zone 10 staff suggests there is a structured exchange of information at monthly status meetings between DWASA and local implementing NGOs (spearheaded by DSK), for discussing issues in service provision to LICs. However, these meetings are mostly reactive in nature and hardly used for proactive risk management that takes into account past learnings. In addition to these meetings, it is common for most larger project stakeholders (donors and leading NGOs) to host workshops and knowledge sharing events (which are planned ahead and budgeted for) as part of their overall project plans, which allow for a degree of reflection.

***Harmonization and alignment – Score 67.5/100***

Secondary information and primary interviews with NGOs have revealed multiple LIC water service delivery models (covered under this study) that are being utilized in Dhaka city in terms of technology and business model. Out of these various models, the CBO-led

approach is the one most clearly preferred by DWASA, as it is a tested model with 6,617 water points connecting approximately 156,000 families to water service as of September 2020. As a consequence, there is a clearly proven CBO model (with a considerable knowledge base) that is uniform and ready for adoption by any other organization choosing this route for establishing new connections.

According to the interview with NGOs, there are regular project-based information exchange sessions between the WASH stakeholders, however, these are also mostly centered on the CBO-model and do not fully incorporate lessons from the perspective of NGOs and operators that use a different model of service provision, thus leaving little room for discussion and learning and harmonization of the models.

***Environment – Score 75/100***

DSK mentioned that there were no formal environmental and social impact assessment conducted prior to the setup of the project in the area. However, they discussed the issues verbally and made alterations to their plans. Furthermore, according to the CBO interview and LIC residents' interviews, a social and environmental assessment was conducted prior to setting up the water system. However, that was conducted in an informal manner with no written report published. Subsequently, negotiations and mediation were practiced to resolve the issues that surfaced from the assessment. Additionally, WOP mentioned that they conduct environmental and social impact assessment prior to the project and prepare reports for their internal use which is taken into consideration for designing the water model in the location.

***Quality of service – Score 58.8/100***

The interview with the CBO highlighted that the water quality of DWASA is not always up to the mark for drinking because the pipe has various holes on it and dirt gets in through them. The water is tested by DWASA; however, the result is not expressed to the community. Furthermore, according to the residents, the water provided in the area is oftentimes described as being either murky or smelly, only a few (10%) of them mentioned that the water is always clear and does not have an odor or color to it.

More than two-thirds (72%) of the respondents mentioned that the quantity of water supplied to the LIC is meeting the required demand of the end-users. In addition, 58% of them mentioned that they get water throughout the day (24/7). Also, the CBO mentioned that they do not get any water supply on Fridays which is a weekend causing inconvenience for the beneficiaries. Most of the times, service interruptions occur in the noon. The beneficiaries mentioned to store water beforehand to go through the day.

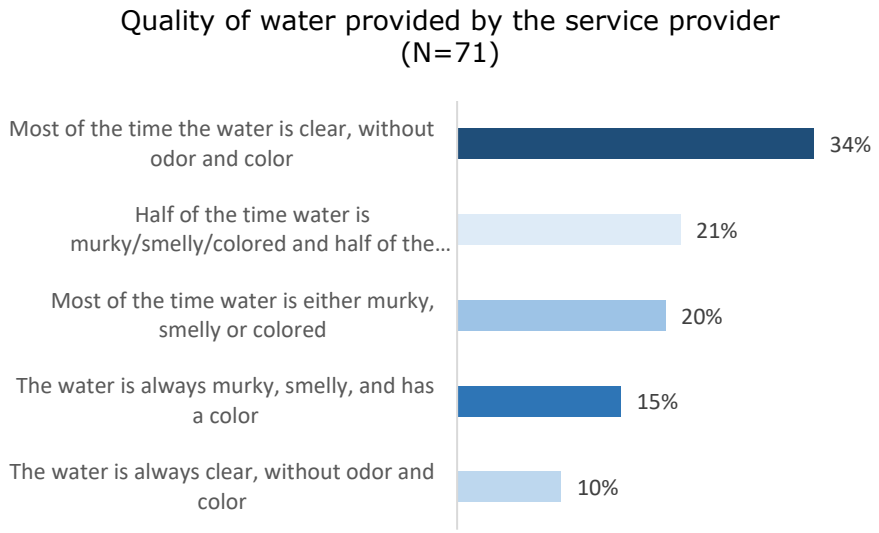



*Figure 18 WOP1 Water Quality*

The CBO leader mentioned that the monthly bill for water is pre-determined depending on the number of families living in a household. It is then carried forward to the rent expense of the families. Two thirds (72%) of the total respondents mentioned that they could regularly pay for the water tariff every month, 28% of them mentioned that they are not able to pay the tariff every month. Additionally, the LIC residents are not willing to spend more money than the existing figure for availing better water services according to the in-depth interviews.

According to in-depth interviews with the residents and the CBO leader, whenever there is a service interruption due to technical difficulties, usually repairs are done within 24 hours. However, if the interruption lasts for more than 24 hours, DWASA provides aid through supplying water to the area.

### 3.1.3. Prevailing Issues and Risk Assessment

The WOP-1 site in questions was found highly susceptible to funding crisis. Over 80% beneficiaries suggested they could not afford to pay regular operations and maintenance expenses and a major vulnerability manifested in the form of low asset management fund, which would be inadequate to cover any substantially large replacement needs in the near future. To mitigate this, potential solutions could include involvement of external stakeholders to replenish this fund, and the suggested pooling of all collective CBO funds by the CPCR unit/DWASA may go some way to diversifying this risk across multiple LIC CBOs. As a completed project, the WOP-1 site also suffers from a decline in the skills and proficiencies of the CBO as a consequence of discontinued CBO training, and general delay in getting issues resolved by DWASA. Rising tariffs on an annual basis and daily wastage of water to flush out dirty water on a daily basis also threaten the financial sustainability of the model.

The following table identifies the main risks that were identified for the WOP-1 model, as it relates to the Hazi Sobhan Road site:

*Table 19 WOP1-NS Risk Assessment*

| Sl. | Description of Risk | Remarks on Prevailing Situation | Risk Category | Probability | Impact | Score |
|---|---|---|---|---|---|---|
| 1 | Users who are not satisfied with the water quality, daily downtimes and rising tariffs may be compelled to shift to illegal lines | There are still illegal lines operating in the area and authorities have not been active in terminating these lines | Political Risk | 1 | 2 | 2 |
| 2 | Threat of resident eviction from LICs | Not a threat at present | Political Risk | 1 | 3 | 3 |
| 3 | Risk of service bottlenecks due to unforeseen capital expenses and water demand increases | Lack of storage and pump capacity and insufficient diameter of distribution pipelines has been flagged as bottlenecks | Investment Risk | 3 | 2 | 6 |
| 4 | Discontinuation of Behavior Change Communication (BCC) programs lead to decline in customer demand | BCC programs discontinued for 2 years, but impact of this is not clear | Operational Risk | 1 | 2 | 2 |

| Sl. | Description of Risk | Remarks on Prevailing Situation | Risk Category | Probability | Impact | Score |
|---|---|---|---|---|---|---|
| 5 | Insufficient capacity (daily downtimes) persists leading to customer attrition | Daily downtime now accepted as part of service by users, attributed to high water demand in peak hours | Operational Risk | 3 | 2 | 6 |
| 6 | DWASA is unresponsive to complaints regarding water quality/ contamination | DWASA has not been able to fully resolve complaints regarding poor water quality | Operational Risk | 3 | 2 | 6 |
| 7 | Skills and performance of CBO declines as external partners phase out training and capacity building programs | CBO was trained by NGO earlier, and the presence of other CBO-led projects ensure continued training but not in the field of water supply management | Operational Risk | 3 | 2 | 6 |
| 8 | Annual tariff increases by DWASA persists and makes tariff unaffordable to LIC residents, resulting in CBO unable to pay the water bill | Tariffs have been rising annually for the past 3 years. Many houses in the LIC have been missing payments, increasing pressure on the CBO. | Tariff Risk | 3 | 2 | 6 |
| 9 | Ageing infrastructure requires high maintenance and capital replenishment costs, which cannot be met with contributions from LIC residents | So far maintenance costs have been low and were sourced from LIC users but no large replenishment was required | Financial Risk | 2 | 3 | 6 |
| 10 | The CBO signatory may relocate or otherwise be unable to perform his/her duties without a formal transfer of power, leaving the CBO unable to access retained funds from the CBO bank account. | NGOs such as DSK are updating the CBO model to mitigate the case where the signatory becomes unavailable | Financial Risk | 1 | 2 | 2 |
| 11 | Daily water wastage when clearing out dirty/ contaminated water from the LIC network system. | Wastage is a daily occurrence now Wastage due to flushing out dirty water happens every morning at present. | Environmental Risks | 3 | 1 | 3 |
| 12 | Donor funding comes to an end and impedes operational and/or capital expenditures | CBO model is designed to operate independently of donors but the limited capacity of users to contribute to a capex fund is a major threat | Financial Risk | 3 | 3 | 9 |
| 13 | DWASA funding comes to an end and impedes operational and/or capital expenditures | Not applicable as DWASA does not cover any O&M costs for this model | Financial Risk | | | |
| 14 | Local political opposition impedes service provision in the LIC/locality | Some level of opposition is expected from purveyors of illegal water lines | Political Risk | 2 | 2 | 4 |
| 15 | DWASA settles on single modality for water service provision to LICs | Not a threat as CBO models and Water ATM models are the formally approved approaches | Regulatory Risk | 1 | 1 | 1 |

## 3.2. WOP2-NS (Non-storage) Model: Zamindarbari

### 3.2.1. General observations:

Zamindarbari is located in Mirpur area of the northern part of Dhaka. Housing multiple LICs, Mirpur is a residential area comprising of mostly of middle and lower-middle income population. The Zamindarbari LIC was selected owing to a large number of households, which numbers around 1,100 and also having the WOP2 project actively operating in the area. The total number of respondents surveyed from Zamindarbari was 69. The respondents were mostly female, accounting for 70%, while males numbered 30%. Among the total respondents, tenants occupied the larger share of 72% and landowners being 28%. Only 11% of the total respondents identified as physically disabled and/or belonging to the religious and ethnic minority group.

*Figure 19 WOP2-NS Model: Zamindarbari Water Point*

DSK started operating in this LIC around 2019 by forming a CBO. The CBO in Zamindarbari is formed of 15 members in total (1 President, 1 Vice-President, 1 General Secretary, 1 Cashier, 1 Publicity Editor and 10 members). The production tube well feeding the water points in the Zamindarbari LIC is being used by around 1,100 households in the LIC and is operated by the CBO and the community members.

### 3.2.2. Dimensions of the Assessment system

The WOP2-NS model scores highest in the *Learning and Knowledge management* dimension, benefiting from being an ongoing project with numerous collaboration efforts conducted and planned. The model scored a high score in the *Quality of Service* dimension considering there are no illegal lines present in the area and the LIC gets proper access to water supply from the water points.

It also scores moderately high along the *Learning and Knowledge Management*, *Policy, legislation and institutions*, and the *Harmonization and alignment* dimensions. The reasons for scoring high in these dimensions are thanks to its adoption of the widely used CBO-NS model, which has a considerable existing knowledge base regarding service provision, stakeholder landscape and an active knowledge exchange platform such as monthly semiannual conference sessions and information dissemination sessions to draw on. It also benefits from being a pioneer in the LIC WASH space by inducting high-pressure water network, which is the new strategic direction of DWASA under its District Metered Area (DMA) network plan.

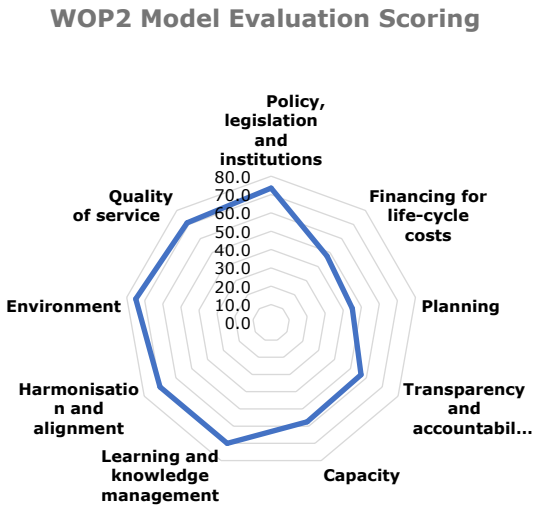



*Figure 20 WOP2 Model Evaluation Scoring*

The model scores lowest in the *Planning* dimension, mainly due to the skewed involvement of landowners in the local CBO and the high proportion of users who use alternative water sources.

***Policy, legislation and institutions – Score 73.5/100***

The majority of the LIC respondents (77%) stated that they were aware of the level of services they should be receiving from the CBO. However, this was expressed in non-technical terms such as "good quality", "clean" or "always available" water service - this is to be expected since the CBO does not have an official charter for LIC residents promising a certain specification of water quality, which limited service professionalization. The CBO, on the other hand, seemed assured of their roles and responsibilities, owing to the involvement of the CBO with DSK and DWASA. However, approximately 35% of respondents believed that the CBO was either not qualified for their role or did not have the proficiency needed for performing certain tasks.

On the selection of water service technology, 30% of the respondents stated that they were either not consulted on technology or were not aware of any consultation events – for a project initiated relatively recently, this suggests that the process was not fully inclusive and that donors, NGOs and CBOs had a greater decision-making power in regards to service model selection.

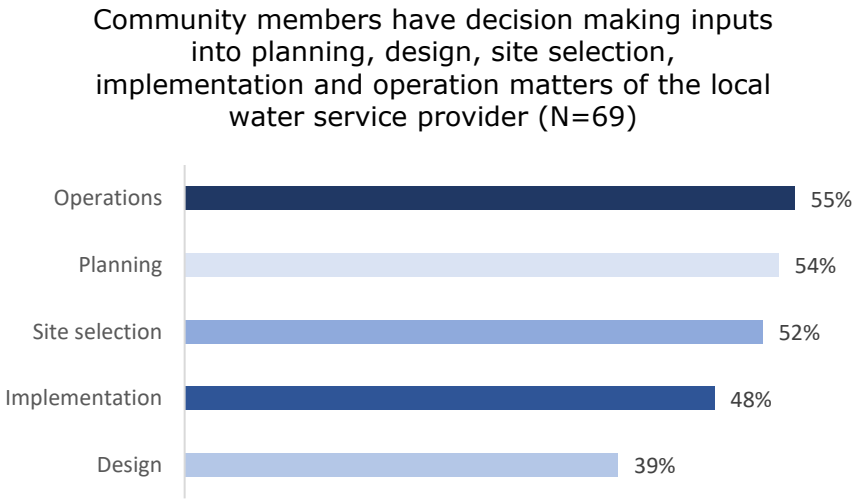



*Figure 21 WOP2-NS Community Input in Decision Making*

For the WOP2 model, DWASA offers full recognition and empowers CBOs to legally represent and take up community water points in LICs. Although there is a formal written

application from the CBO to the DWASA for line setup, there are no direct service contract or service level agreement between DWASA and the particular CBO. Regarding the technology to be used, DWASA only recommends the generic components to be used for establishing connection to the piped network, but does not have any written guidelines or informal suggestions for the water point hardware.

***Financing for life-cycle costs- Score 47.5/100***

Almost two thirds (64%) of the respondents mentioned that they do not pay for the operation and maintenance fund for the water points, however, 30% mentioned that they can afford to pay for the fund on a regular basis, while the rest of them could not afford to pay any money for the fund. Although, they do not have a well-structured mechanism in place to provide finance for the CAPEX, they do have a WASH fund in place managed by DSK. Due to the relatively recent initiation of the project, the water points have not required any maintenance so far after their construction and set up.

According to the interview with the CBO, operational expenditure is not assessed for the water points. Lastly, they have a written complaint mechanism in place, however, 9% of the respondents stated that it is highly ineffective while another 9% differed in opinion stating there is no mechanism in place.

***Planning- Score 45/100***

According to the CBO, before bringing in new water connections or any new project, the project is pre-discussed with the members of the society. The opinions of the community members are taken into consideration and used to reach an agreement before proceeding. However, only 65% of the respondents mentioned, before finalizing the location and/or type of the water point for the LIC, they were consulted on their opinion. The population of the LIC consist of 'floating people'. Many people move from one place to another, which makes it difficult to interact with 'permanent' residents. The landowners are one of the few 'permanently available' community members. The respondents also mentioned that, the landowners act as the representatives of the tenants in providing inputs into the decision-making process. Mostly, opinions are taken from the community leaders who act as the representatives of the community.

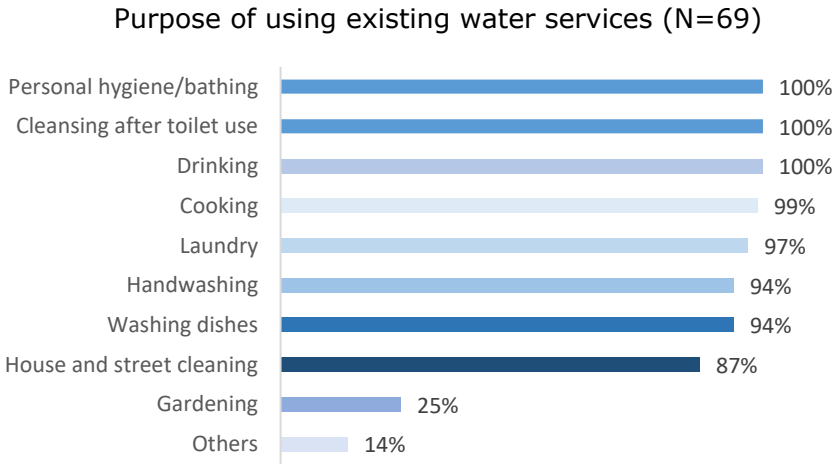



*Figure 22 WOP 2 Purpose of using existing water services*

All of the LIC respondents (100%) use the water from the service provider for drinking purposes and as well as for other household chores. However, 43% of them use other sources of water to satisfy their demand for water (such as in cases where they may have purchased drinking water separately from outside the LIC). However, as per the interview with the CBO and the LIC residents, no assessments or surveys were conducted prior to the project which would identify the scopes of using water from the water points. The CBO mentioned that they do not have any illegal water sources in their area. However, there are other water points set up by other NGOs in the area. Furthermore, although 100% of the respondents

stated that the water points are accessible for all, the CBO mentioned that the water points are not user friendly for physically disabled people. Additionally, 86% of the respondents found the awareness raising campaigns in the area to be helpful.

***Transparency and accountability- Score 56.7/100***

According to the CBO interview, DWASA representatives occasionally visit the community to gather information about the problems they are facing. The interview with CBO highlighted that the services provided by the service providers are not monitored regularly or against any standard. Even if they are looked over by a representative, there has been little to no evidence of any corrective action taken in order to resolve the issues identified. According to DSK, they have to abide by the water quality protocol for the projects funded by WaterAid. The water sample is tested for fecal coliform before handing over the project. Water quality tests are initiated every three months by DSK.

Furthermore, if any resident encounters trouble with their water service, they would have to communicate with the CBO through a written notice. Then, the CBO responds to the issue. In addition, the complaints system remains untested as users did not face any major repair or technical issues regarding the water service yet. Only 22% of the LIC respondents are aware of the administrative information of the CBOs (procurement and financial matters etc.), while the rest were unaware. The CBO does not share any performance related or financial information with the community. Furthermore, it has been mentioned by the respondents and the CBO leader that information regarding the services/functionality of the LIC water services has been collected, however, they were not made available to the community. According to the LIC residents' survey, 90% of the respondents mentioned that there is a complaint mechanism in place for reporting issues regarding service delivery or malpractices.

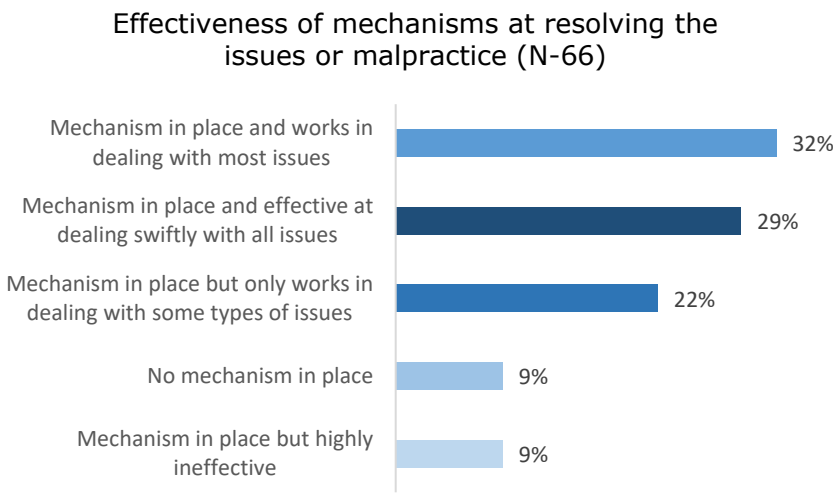



*Figure 23 WOP2 Effectiveness of Complaint Mechanism*

***Capacity- Score 57.5/100***

According to the CBO interview, they get training and support facilities from DSK. DSK and WOP conducted different sessions with CBO members in trying to educate them on maintenance, management, water storage and hygiene-related matters. Furthermore, the CBO mentioned they receive training sessions once or twice a year. DWASA does not conduct any training sessions for the CBO and neither had any plans or budget provisions to this end.

The Zamindar Bari LIC does however benefit from being a part of multiple interventions - for example, management of toilets in addition to water supply - taken on under the CBO leadership, making it more likely for continued training of the CBO. Additionally, monthly sessions are conducted by DSK/CBO among community members on raising awareness of water-related diseases.

Furthermore, WOP provides training to DWASA staff on topics of DMA management including Non-Revenue Water (NRW), Supervisory control and data acquisition (SCADA) management and benchmarking. An organization named MDF developed training modules and delivered them to DWASA as an external consultant. Additionally, hands-on training was provided to MODS Zone staff by the experts of WOP2 project. WOP2 also provided training on meter reading to the staff of the Revenue Zone of DWASA.

***Learning and knowledge management- Score 65/100***

According to beneficiary IDIs, at least one monthly meeting is held with the CBO involving community members. Interviews with DSK and the DWASA MODS Zone 10 staff suggests there is a structured exchange of information at monthly status meetings between DWASA and local implementing NGOs (spearheaded by DSK), for discussing issues in service provision to LICs. However, these meetings are mostly reactive in nature and hardly used for proactive risk management that takes into account past learnings. In addition to these meetings, it is common for most larger project stakeholders (donors and leading NGOs) to host workshops and knowledge sharing events (which are planned ahead and budgeted for) as part of their overall project plans, which allow for a degree of reflection.

***Harmonization and alignment- Score 70/100***

Secondary information and primary interviews with NGOs have revealed multiple LIC water service delivery models that are being utilized in Dhaka city in terms of technology and business model. Out of these various models, the CBO-led approach is the one most clearly preferred by DWASA, as it is a tested model with 6,617 water points connecting approximately 156,000 families to water service as of September 2020. As a consequence, there is a clearly proven CBO model (with a considerable knowledge base) that is uniform and ready for adoption by any other organization choosing this route for establishing new connections.

According to interviews with implementing NGOs, there are regular project-based information exchange sessions between the WASH stakeholders, however, these are also mostly centered on the CBO-model and does not fully incorporate lessons from the perspective of NGOs and operators belonging to a different model of service provision, leaving further room for inclusion and harmonization of the models. Additionally, as this is an ongoing new adaptation of the CBO to a pressurized model, the stakeholders are actively involved with in knowledge management and advocacy.

***Environment- Score 75/100***

WOP mentioned that they conduct environmental and social impact assessment prior to the project and prepare reports for their internal use which is taken into consideration for designing the water model in the location. DSK, the implementing NGO, did not conduct their own environmental and social impact assessment conducted prior to the setup of the project in the area. However, they discussed the issues verbally and made alterations to their plans. Beneficiary IDIs confirmed that environmental and social impacts were discussed beforehand with community members.

***Quality of service- Score 71.3/100***

According to the CBO interview, the water quality is not up to the mark as it contains iron and sometimes has an odor. They further mentioned that, more than half of the respondents drink water from the source without boiling, while the rest boil the water before drinking.

Majority (94%) of the respondents mentioned that the quantity of water supplied to the LIC is meeting the required demand of the end-users. Furthermore, 97% of them stated that the water provided in the LIC is available throughout the day (24/7).

The CBO leader mentioned that the water bills are aggregated into the rental expenses. According to the LIC residents' survey, 80% of beneficiaries stated that they can afford to pay water tariff every month. However, 10% of the respondents mentioned that sometimes they cannot afford to pay the water bill while the other 10% said that they cannot afford to pay for it at all.

According to the CBO interview, the water is not available for 24 hours a day, however, the residents somehow make do with the water they get by storing water. According to the CBO, during service interruptions, it used to take about 2-3 days for the service authority to fix it. However, the service downtime has reduced significantly over recent times since WOP intervention, and generally do not go beyond 4-5 hours at present. According to CBOs, whenever there is a probability of water not being available for the next day, the residents are notified beforehand to take preventive measures. If the interruption lasts for more than 24 hours, DWASA provides emergency water supply through water tankers to the area. However, according to the LIC residents' survey, only 81% of the respondents stated that if any repairs are needed, they are generally completed within 24 hours. 10% of beneficiaries stated that it takes more than 24 hours to complete repairs.

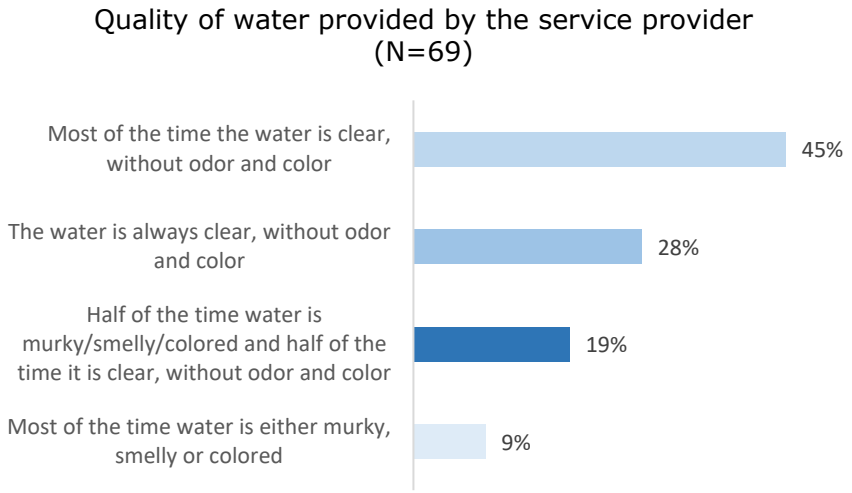



*Figure 24 WOP2 Water Quality*

### 3.2.3. Prevailing Issues and Risk Assessment

The main risk facing the WOP2-NS model is a systemic one, namely that of rising water tariff costs, occurring on an annual basis. Hence, the solution is also a systemic one and the genuine interest of DWASA to introduce a progressive tariff scheme, depending on how it is structured, can go a long way to minimize the threat from rising tariff costs.

The following table identifies the main risks that were identified for the WOP-2 model, as it relates to the Zamindarbari site:

*Table 20 WOP2-NS Risk Assessment*

| Sl. | Description of Risk | Remarks on Prevailing Situation | Risk Category | Probability | Impact | Score |
|---|---|---|---|---|---|---|
| 1 | Users who are not satisfied with the water quality, daily downtimes and rising tariffs may be compelled to shift illegal lines | Illegal lines are not present in Zamindar Bari LIC according to locals | Political Risk | 1 | 2 | 2 |

| Sl. | Description of Risk | Remarks on Prevailing Situation | Risk Category | Probability | Impact | Score |
|---|---|---|---|---|---|---|
| 2 | Threat of resident eviction from LICs | Not a probable threat at present | Political Risk | 1 | 3 | 3 |
| 3 | Risk of service bottlenecks due to unforeseen capital expenses and capacity increases | CBO has a moderate build-up of O&M/ Capital funds | Investment Risk | 2 | 2 | 4 |
| 4 | Discontinuation of BCC programs lead to decline in customer demand | BCC programs are being continued by the CBO through NGO support | Operational Risk | 1 | 2 | 2 |
| 5 | Insufficient capacity (daily downtimes) persists leading to customer attrition | Water is generally available in sufficient quantity in present and lack of illegal water options will prevent attrition | Operational Risk | 1 | 2 | 2 |
| 6 | DWASA is unresponsive to complaints regarding water quality/ contamination | Water quality is considered moderate and there is room for improvement | Operational Risk | 2 | 2 | 4 |
| 7 | Skills and performance of CBO declines as external partners phase out training and capacity building programs | Training is conducted for CBO, but the continuity of training following project conclusion is uncertain | Operational Risk | 2 | 2 | 4 |
| 8 | Annual tariff increases by DWASA persists and makes tariff unaffordable to LIC residents, resulting in CBO unable to meet tariffs payments | Tariffs have been rising annually for the past 3 years. However, affordability at present not considered as an issue for residents | Tariff Risk | 3 | 2 | 6 |
| 9 | Ageing infrastructure requires high maintenance and capital replenishment costs, which cannot be met with contributions from LIC residents | Infrastructure is relatively new and has not needed replacement or major repairs thus far | Financial Risk | 1 | 3 | 3 |
| 10 | The CBO signatory may relocate or otherwise by unable to perform his/her duties without a formal transfer of power, leaving the CBO unable to access retained funds from the CBO bank account. | NGOs such as DSK are working to update CBO model with contingencies in case the signatory becomes unavailable | Financial Risk | 1 | 2 | 2 |
| 11 | Daily water wastage when clearing out dirty/ contaminated water from the LIC network system. | Not applicable | Environmental Risks | | | |
| 12 | Donor funding comes to an end and impedes operational and/or capital expenditures | CBO models is designed to operate independently of donors, and the moderate fund will act as a buffer | Financial Risk | 2 | 2 | 4 |

| Sl. | Description of Risk | Remarks on Prevailing Situation | Risk Category | Probability | Impact | Score |
|---|---|---|---|---|---|---|
| 13 | DWASA funding comes to an end and impedes operational and/or capital expenditures | Not applicable as DWASA does not cover any O&M costs for this model | Financial Risk | | | |
| 14 | Local political opposition impedes service provision in the LIC/locality | Not a probable threat at present as service set up with community support | Political Risk | 1 | 1 | 1 |
| 15 | DWASA settles on single modality for water service provision to LICs | Not a threat as CBO models and Water ATM models are the formally approved approaches | Regulatory Risk | 1 | 1 | 1 |

## 3.3. CBO-NS (Non-storage) Model: Satellite LIC Direct Line with no tank

### 3.3.1. General observations:

Satellite LIC is located in the Mohakhali region of Dhaka. Mohakhali is a commercial area surrounded by residential housing areas for middle- and upper-income population. The area also houses multiple LICs. The location was selected owing to its large population of 16,200 residents. Additionally, DSK is currently operating in this area. The total number of respondents surveyed from Satellite LIC (Direct Line with no tank) was 66. A large majority of the respondents (76%) were female while the rest of the 24% of them were males. Among the total respondents, only 1% belonged to the ethnic minority groups.

*Figure 25 Non-WOP CBO-NS: Satellite LIC Water Points*

DSK started operating in this LIC around 2017 by forming a CBO. The total number of members in the CBO is 23 (among them, 4 has set designations while the rest are general members). The CBO was selected through discussion among the representatives of the society through votes.

### 3.3.2. Dimensions of the Assessment system

The Non-WOP CBO-NS model achieves its highest scores along the *Environment* dimension, benefiting from donor-lend initiatives to take into consideration social and environmental factors prior to establishing the water service delivery.

It also scores moderately high along the *Learning and Knowledge Management*, *Policy, legislation and institutions*, and the *Harmonization and alignment* dimensions. The reasons for scoring high in these dimensions are thanks to its adoption of the widely used CBO model, which has a considerable existing knowledge base, stakeholder landscape

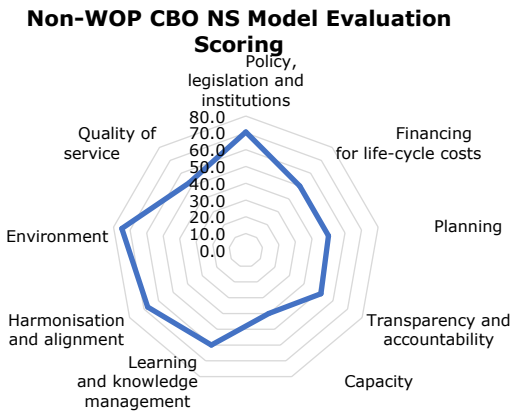



*Figure 26 Non-WOP CBO NS Model Evaluation*

and an active knowledge exchange platform to draw on. The model scored a moderately average score in the dimension *Quality of Service* due to lack of proper access to clean water. It is also beneficial that CBO-led models are clearly the most favored approach of DWASA for reaching LIC communities.

The lowest scores the model achieves are in the *Capacity* dimension, which has been attributed to the long discontinuation of CBO training initiatives.

***Policy, legislation and institutions- Score 70.5/100***

More than two-third of the LIC users (74%) stated that they were aware of the level of services they should be receiving from the CBO. However, this was expressed in non-technical terms such as "good quality", "clean" or "always available" water service - this is to be expected since the CBO does not have an official charter for LIC residents promising a certain specification of water quality, which limited service professionalization. CBO, on the other hand, seemed clear about their roles and responsibilities, owing to the involvement of the CBO with DSK and DWASA. However, approximately 58% of respondents believed that the CBO was either not qualified for their role or did not have the proficiency needed for performing certain tasks.

On the selection of water service technology, 19% of the respondents stated that they were either not consulted on technology or not were not aware of any consultation events - this suggests that the donors, NGOs and CBOs had a greater decision-making power in regards to service model selection.

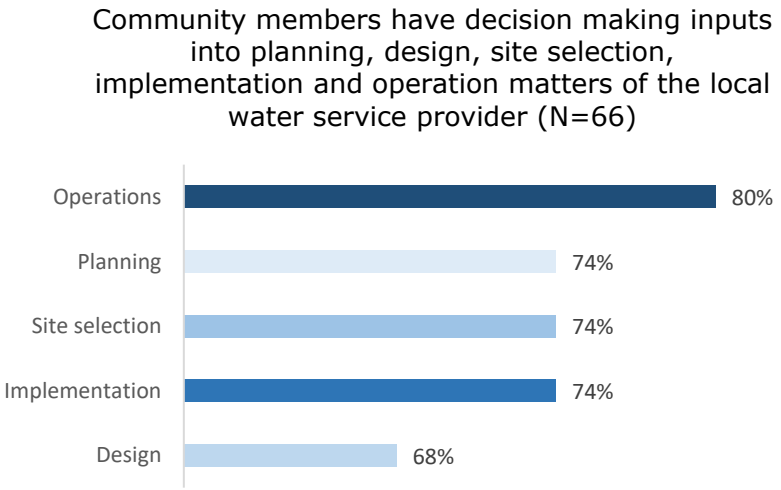



*Figure 27 Non-WOP CBO-NS Community Input in Decision Making*

According to the CBO interview, they have an agreement with DWASA regarding the supply of water. DWASA offers full recognition and empowers CBOs to legally represent and take up community water points in LICs. Although there is a formal written application from the CBO to the DWASA for line setup.

***Financing for life-cycle costs- Score 50/100***

The vast majority (83%) of respondents mentioned that they do not pay for the operation and maintenance fund for the water points. 15% of beneficiaries mentioned that they can pay for the fund on a regular basis, while the rest of them could not afford to pay any money for the fund. Although, they do not have a well-structured mechanism in place to provide finance for the CAPEX, they do have a significantly large WASH fund in place along with DSK. However, money for repairing and maintenance is collected from households using the water service Mostly, households pay for their own repairs, however, the CBO sometimes assists in the process.

According to the community leader, for minor repairs of the water line, individual LIC residents are responsible to pay for their repair. But for a major repair, LIC residents

interact with the CBO committee members and they fix the issue by raising money from the LIC dwellers. Lastly, even though 79% of the respondents mentioned that there is a complaint mechanism in place, 32% mentioned that the mechanism is highly ineffective while another 21% said there is no mechanism in place.

***Planning- Score 50/100***

According to the community leader, community members had the opportunity to give feedback into the planning, design, implementation and operations matters of the local water service provider. However, two third of the beneficiaries interviewed mentioned that even though they were consulted no opinions were taken from women, children, the elderly, the disabled and the ethnic minorities. It should be noted here that most LIC population across Dhaka are not stable, with tenants moving from place to place due to changes in employment and lifestyle etc., which is why most CBO models rely on landowner representation in CBOs.

More than two third (77%) of the respondents uses the water from the water source for drinking purposes as well as for other household chores. However, 27% of them use other sources of water to satisfy their demand for water. However, as per the interview with the CBO and the LIC residents, no assessment or survey were conducted prior to the project which would identify the scope of using water from this water points. According to the LIC respondents, 88% of them said that their water points can be safely accessed and used throughout the day by all user groups. While 11% of them said that it is not accessible for most people. Furthermore, awareness events are held often and considered to be useful by the beneficiaries interviewed.

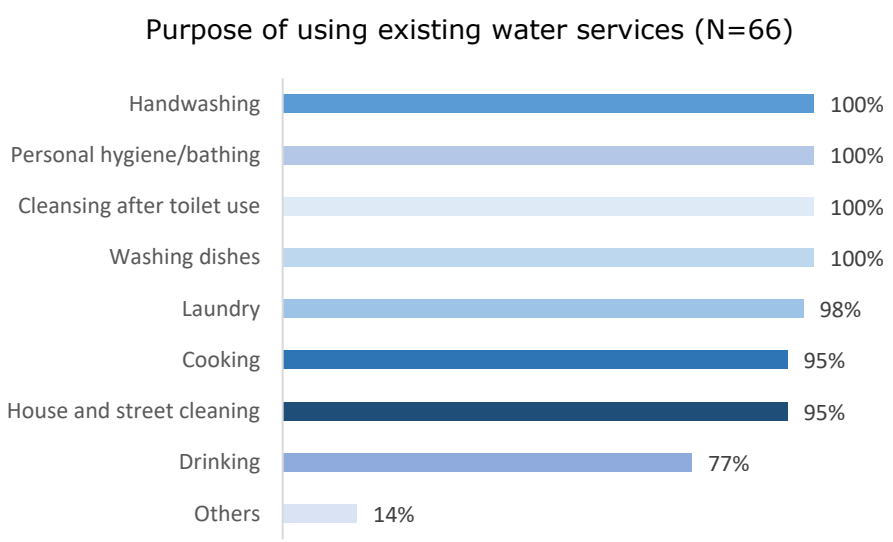



*Figure 28 Non-WOP CBO-NS Purpose of using existing water services*

***Transparency and accountability- Score 51.7/100***

According to DSK, their projects have to abide by the water quality protocol set by the donor, WaterAid. The water sample is tested for fecal coliform before handing over the project. The CBO is unaware of any monitoring mechanism in place. According to the LIC residents' survey, only 35% of the respondents mentioned that the service providers make information (including financial and procurement matters) clear to the respondents.

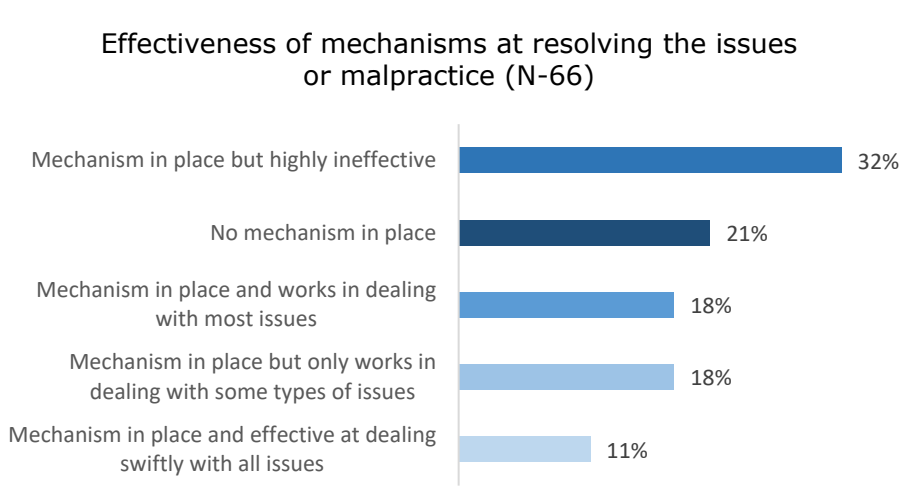



*Figure 29 Non-WOP CBO-NS Effectiveness of Complaint Mechanism*

According to the CBO, DWASA is made aware of the illegal lines. However, no steps have been taken yet despite high-level interviews with DWASA suggest that they take necessary steps to eradicate illegal lines as soon as they are made aware of it. According to the LIC residents' survey, only 35% of the respondents mentioned that the service providers make information (including financial and procurement matters) clear to the respondents. According to 79% of the respondents, there is a complaint mechanism in place. Beneficiary IDIs made it clear that the complaint mechanism in place is informal & unwritten. 32% of survey respondents mentioned that the mechanism is highly ineffective while another 21% said there is no mechanism in place at all.

***Capacity- Score 40/100***

According to the CBO, area meetings are usually organized by NGO/DSK and CBO. Furthermore, DSK provided training in the beginning of the project. According to DWASA interview, they do not have any training sessions for the CBO and neither had any plans or budget provisions to this end. According to DSK, they provide training on leadership, financial management and technical aspects to the CBO to increase their capacity. However, no structured needs assessment is done prior to the training.

***Learning and knowledge management- Score 60/100***

Interviews with DSK and the DWASA MODS Zone 10 staff suggests there is a structured exchange of information at monthly status meetings between DWASA and local implementing NGOs (spearheaded by DSK), for discussing issues in service provision to LICs. However, these meetings are mostly reactive in nature and hardly used for proactive risk management that takes into account past learnings. In addition to these meetings, it is common for most larger project stakeholders (donors and leading NGOs) to host workshops and knowledge sharing events (which are planned ahead and budgeted for) as part of their overall project plans, which allow for a degree of reflection. Furthermore, according to community leader, sessions have been conducted by DSK to educate the residents on maintenance, management, water storage and hygiene-related issues.

***Harmonization and alignment- Score 67.5/100***

Secondary information and primary interviews with NGOs have revealed multiple LIC water service delivery models (covered under this study) that are being utilized in Dhaka city in terms of technology and business model. Out of these various models, the CBO-led approach is the one most clearly preferred by DWASA, as it is a tested model with 6,617 water points connecting approximately 156,000 families to water service as of September 2020. As a consequence, there is a clearly proven CBO model (with a considerable knowledge base) that is uniform and ready for adoption by any other organization choosing this route for establishing new connections.

According to the interview with NGOs, there are regular project-based information exchange sessions between the WASH stakeholders, however, these are also mostly centered on the CBO-model and does not fully incorporate lessons from the perspective of NGOs and operators belonging to a different model of service provision, leaving further room for inclusion and harmonization of the models.

***Environment- Score 75/100***

According to WaterAid, they are the ones who do formal environmental and social impact assessment prior to site selection. DSK, the implementing NGO, does not conduct a formal environmental and social impact assessment prior to the setup of the project in the area. However, they do discuss the issues verbally with the community and make necessary alterations to their plans. According to all beneficiary IDIs, before installing the water line, they check and choose the environmental and social aspects and identified issues are usually solved through compromise. However, 1 IDI respondent mentioned that their inputs were not heeded during impact assessment phase.

***Quality of service- Score 52.5/100***

According to the CBO leader, the water quality of DWASA was not clean initially, however, the quality is better now. Furthermore, according to the community leader, the quality of water is quite good and one can drink from the tap directly. The water is not smelly or murky. Most of the time the water is clear, without odor and color.

According to the LIC residents' survey, 56% of the respondents mentioned that the supply from the LIC system is sufficient to meet the requirements by the end-users. Additionally, 47% of the respondents mentioned that the water provided in the LIC is available throughout the day (24/7). However, if they do face supply interruption, 58% of the time it is at noon.

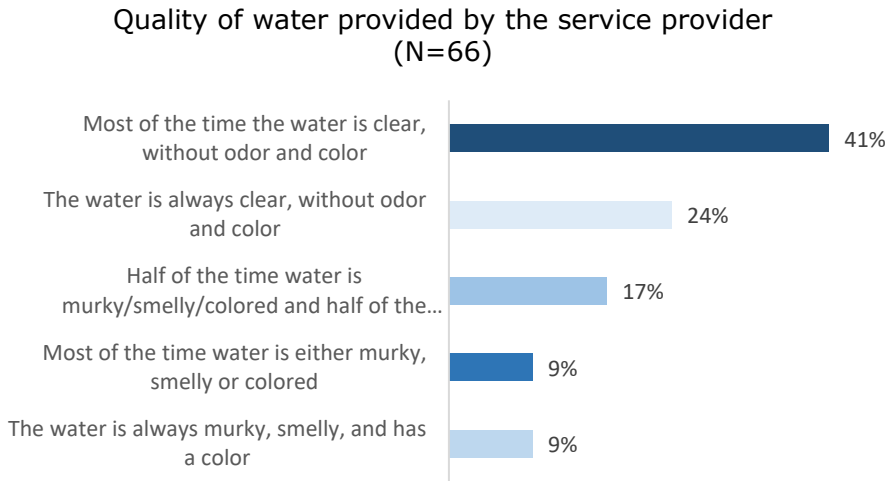



*Figure 30 Non-WOP CBO-NS Water Quality*

According to the community leader, the water points can be safely accessed and used throughout the day by both men and women, minorities, the elderly and disabled. However, 11% of the survey beneficiaries mentioned that it is inaccessible for most people. Furthermore, according to the LIC residents' survey 42% mentioned that they do not face any service interruption at all. While 21% mentioned that they face service interruption

once or twice a month, 17% mentioned that they face service interruption every day. Additionally, only 36% of the respondents mentioned that whenever there is a service interruption, the repairs are mostly completed within 24 hours. 45% of surveyed beneficiaries said repairs are not completed within 24 hours. One of the beneficiaries interviewed mentioned that their line has been closed for years with zero water in the line.

According to the CBO interview, the cost per line is dependent on the number of rooms of the household and varies from BDT 500-1,000. They further mentioned every user has a set bill of BDT 300-320. However, the charging method has changed over the last few months, as they are being charged by the meter calculating their water usage. 80% of the respondents of the LIC survey mentioned that they can afford to pay for the water tariff every month, while 6% mentioned that they cannot afford to pay it at all.

### 3.3.3. Prevailing Issues and Risk Assessment

Among prominent risks to the Satellite LIC CBO-NS site, it was highly susceptible to funding crisis. Over 15% beneficiaries regularly pay into operations and maintenance fund and at least one interviewed beneficiary reported that their water points had become completely obsolete and did not supply any water. To mitigate this, potential solutions could include involvement of external stakeholders to replenish this fund, and the suggested pooling of all collective CBO funds by the CPCR unit/DWASA may go some way to diversifying this risk across multiple LIC CBOs.

As a completed project, the site also faces decline in CBO proficiency due to training discontinuation, water quality issues which are not sufficiently addressed by the community or stakeholders. Like other CBO-led models, it is susceptible to rising water tariffs, however it is not clear if landowners will pass on any expected tariff increases on to consumers. Finally, the site also faces a moderate but not insignificant risk of eviction.

The following table identifies the main risks that were identified for the Non-WOP CBO partnership model, as it relates to the Satellite LIC (Non-Storage):

*Table 21 Non-WOP CBO-NS Risk Assessment*

| Sl. | Description of Risk | Remarks on Prevailing Situation | Risk Category | Probability | Impact | Score |
|---|---|---|---|---|---|---|
| 1 | Users who are not satisfied with the water quality, daily downtimes and rising tariffs may be compelled to shift illegal lines | There are numerous illegal lines operating in the area but authorities have not been active in terminating these lines | Political Risk | 2 | 3 | 6 |
| 2 | Threat of resident eviction from LICs | Not a probable threat, but the risk is still moderate | Political Risk | 2 | 3 | 6 |
| 3 | Risk of service bottlenecks due to unforeseen capital expenses and capacity increases | Water service blackouts during a certain part of the day is common, and in some areas water points have become obsolete and unusable | Investment Risk | 2 | 3 | 6 |
| 4 | Discontinuation of BCC programs lead to decline in customer demand | Awareness raising events are held from time to time and beneficiaries find them to be useful | Operational Risk | 1 | 2 | 2 |

| Sl. | Description of Risk | Remarks on Prevailing Situation | Risk Category | Probability | Impact | Score |
|---|---|---|---|---|---|---|
| 5 | Insufficient capacity (daily downtimes) persists leading to customer attrition | Water service blackouts during a certain part of the day is common, and in some areas water points have become obsolete and unusable | Operational Risk | 3 | 2 | 6 |
| 6 | DWASA is unresponsive to complaints regarding water quality/ contamination | DWASA has not been able to resolve complaints regarding poor water quality | Operational Risk | 3 | 2 | 6 |
| 7 | Skills and performance of CBO declines as external partners phase out training and capacity building programs | Training is conducted for CBO | Operational Risk | 2 | 2 | 4 |
| 8 | Annual tariff increases by DWASA persists and makes tariff unaffordable to LIC residents, resulting in CBO unable to meet tariffs payments | Tariffs have been rising annually for the past 3 years, but beneficiaries have indicated that they are able to pay the tariffs at present level. | Tariff Risk | 3 | 2 | 6 |
| 9 | Ageing infrastructure requires high maintenance and capital replenishment costs, which cannot be met with contributions from LIC residents | Capital funds are moderately available, despite this some water points remain obsolete and unusable | Financial Risk | 3 | 3 | 9 |
| 10 | The CBO signatory may relocate or otherwise by unable to perform his/her duties without a formal transfer of power, leaving the CBO unable to access retained funds from the CBO bank account. | NGOs such as DSK are working to update CBO model with contingencies in case the signatory becomes unavailable | Financial Risk | 1 | 2 | 2 |
| 11 | Daily water wastage when clearing out dirty/ contaminated water from the LIC network system. | Not applicable | Environmental Risks | | | |
| 12 | Donor funding comes to an end and impedes operational and/or capital expenditures | CBO models is designed to operate independently of donors but the already existing bottlenecks make it a severe issue | Financial Risk | 3 | 3 | 9 |
| 13 | DWASA funding comes to an end and impedes operational and/or capital expenditures | Not applicable as DWASA does not cover any O&M costs for this model | Financial Risk | | | |
| 14 | Local political opposition impedes service provision in the LIC/locality | Opposition is expected from purveyors of illegal water lines | Political Risk | 2 | 3 | 6 |
| 15 | DWASA settles on single modality for water service provision to LICs | Not a threat as CBO models and Water ATM models are the formally approved approaches | Regulatory Risk | 1 | 1 | 1 |

## 3.4. CBO-S (Storage) Model Performance Summary

The Non-WOP CBO-S model achieves its highest scores from along the *Environment* dimension, benefiting from donor-lend initiatives to take into consideration social and environmental factors prior to establishing the water service delivery. The model scored a mid-range score under the dimension of *Quality of Service* due to insufficiency of proper water supply to the users along with poor quality of water.

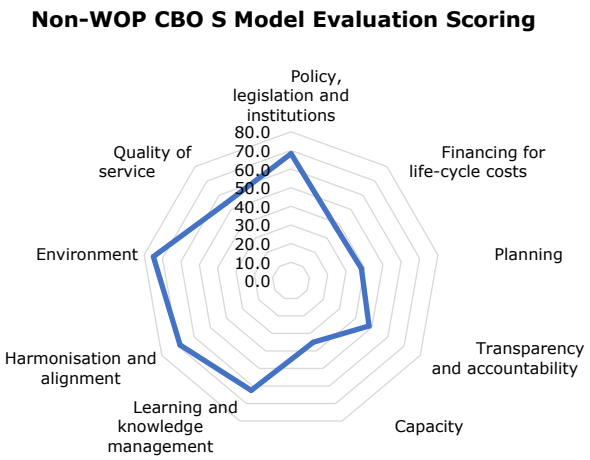



*Figure 31 Non-WOP CBO-S Model Evaluation Scoring*

It also scores moderately high along the *Learning and Knowledge Management*, *Policy, legislation and institutions*, and the *Harmonization and alignment* dimensions. The reasons for scoring high in these dimensions are thanks to its adoption of the widely used CBO model, which has a considerable existing knowledge base, stakeholder landscape and an active knowledge exchange platform such as conferences and/or information dissemination sessions. to draw on. It is also beneficial that CBO-led models are clearly the most favored approach of DWASA for reaching LIC communities.

However, the model scores lowest in the *Capacity* and *Planning* dimension, due mainly to the skewed involvement of landowners in the local CBO and the reported ineffectiveness of the CBOs in dealing with issues. The model also scores in the lower half of the scale for the *Financing for life-cycle costs* dimension, which has been attributed to the low accumulated capital expenditure fund, which is a feature seen in post-completion projects, raising questions about sustained and well-financed continuation of operations, which is closely tied to the aptitude of the operator/CBOs as well.

## 3.5. CBO-S (Storage) Model: Satellite LIC Line with reservoir

### 3.5.1. Site observations:

Satellite LIC is located in the Mohakhali region of Dhaka. Mohakhali is a commercial area surrounded by residential housing areas for middle- and upper-income population. The area also houses multiple LICs. The location was selected owing to its large population of 16,200 residents. DSK started the project in this area in 2018. The total number of respondents surveyed from Satellite LIC (with storage/reservoir) was 73. Most of the respondents (73%) were female while the rest of the 27% of them were males. Among the total respondents, only 1% belonged to the ethnic minority group while another 1% belonged to the physically disabled population.

*Figure 32 Non-WOP CBO-S1 Model: Satellite LIC Water Point*

DSK has been operating in the Satellite LIC since 2017 with their direct line model with no tank. In 2018, they started this technology variant with reservoirs. The CBO has a total number of 21 members (1 President,

1 General Secretary, 1 Vice-President, 1 Cashier, 1 Joint Secretary and others being members). The CBO was formed with the initiation of DSK and upon discussion and agreement of the members of the society.

The CBO president himself provides water to the beneficiaries using illegal water sources for their own profit by allegedly blocking the water from the DWASA provided water points. They previously operated an illegal water point prior to the intervention of DSK.

### 3.5.2. Dimensions of the Assessment system

***Policy, legislation and institutions- Score 71/100***

Around 71% of the survey respondents stated that they were aware of the level of service they should be receiving from their service providers. However, this was expressed in non-technical terms such as "good quality", "clean" or "always available" water service - this is to be expected since the CBO does not have an official charter for LIC residents promising a certain specification of water quality, which limited service professionalization. The CBO, on the other hand, seemed assured of their roles and responsibilities, owing to the involvement of the CBO with DSK and DWASA. However, approximately 48% of respondents believed that the CBO was either not qualified for their role or did not have the proficiency needed for performing certain tasks.

On the selection of water service technology, 30% of the respondents stated that they were either not consulted on technology or were not aware of any consultation events - this suggests that the donors, NGOs and CBOs had a greater decision-making power in regards to service model selection.

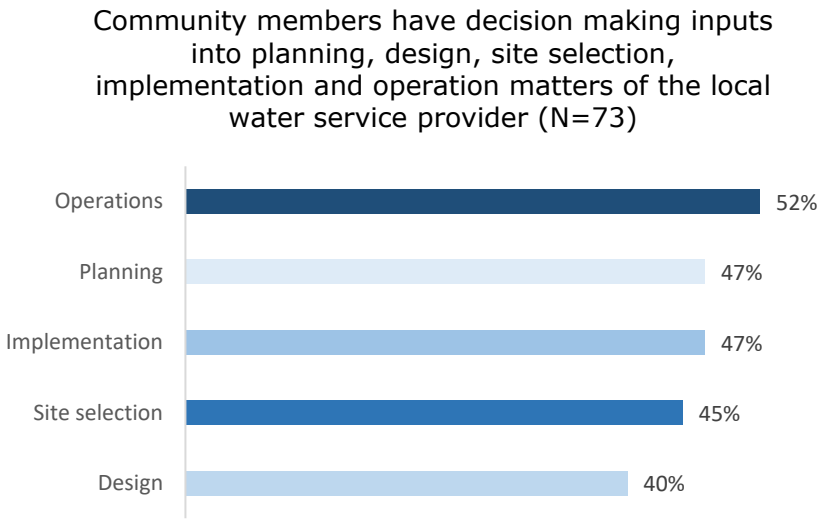



*Figure 33 Non-WOP CBO S1 Community Input in Decision Making*

According to the DWASA interview, DWASA offers full recognition and empowers CBOs to legally represent and take up community water points in LICs. The line was set up after a formal written application was submitted from the CBO to the DWASA for line setup with the help of DSK. Furthermore, according to the CBO interview, the LIC residents are not fully aware of the presence of the CBO.

***Financing for life-cycle costs- Score 35/100***

The vast majority (86%) of the respondents mentioned that they do not pay for the operation and maintenance fund for the water points, while 12% mentioned that they can for the fund on a regular basis and the remainder could not afford to pay any money for the fund. According to the CBO interview, they do not have a well-structured mechanism in place or any active WASH fund. However, according to the CBO interview, the project ended before requiring any maintenance work. Furthermore, the CBO mentioned DSK

provided for a fund though the bank. They put 2% of the proceeds collected for each new line to the fund.

According to the community leader, for minor repairs of the water line, individual LIC residents are responsible to pay for their repair. They are not aware if there is any O&M fund for such expenses. Lastly, even though 88% of the respondents mentioned that there is a complaint mechanism in place, 21% mentioned that the mechanism is highly ineffective while another 12% said there is no mechanism in place.

***Planning- Score 36.7/100***

According to the beneficiaries interviewed, two out of three believed that the planning process was inclusive while the third stated that they believe opinions are not taken from women, children, the elderly, the disabled and ethnic minorities. Furthermore, opinions are taken only from house owners. It should be noted here that most LIC population across Dhaka are not stable, with tenants moving from place to place due to changes in employment and lifestyle etc., which is why most CBO models rely on landowner representation in CBOs.

Around two-thirds (63%) of the LIC respondents used the water from the water source for drinking purposes as well as for other household chores. However, 42% of them used other sources of water to satisfy their demand for water. As per the interview with the CBO and the LIC residents, no assessment or survey at the LIC was conducted prior to the project which would identify the scope of using water from the water points. According to the respondents of the LIC, 89% of them said that their water points can be safely accessed and used throughout the day by all user groups. Only 3% of them said that it is not accessible for most people. According to two out of three IDI respondents, awareness events are held often and considered to be useful.

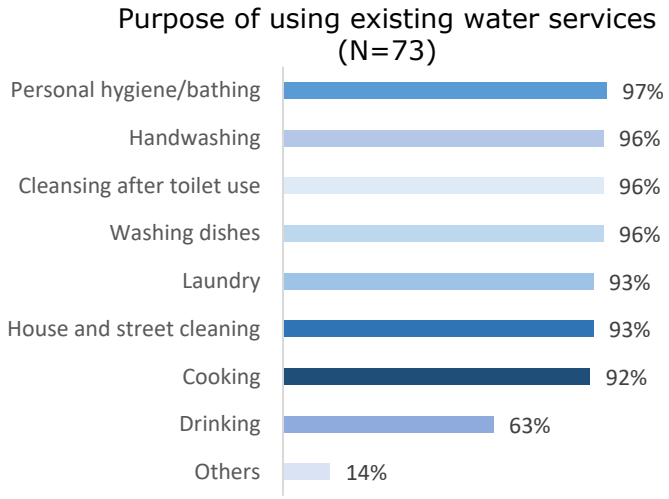



*Figure 34 Non-WOP CBO-S1 Purpose of using existing water services*

***Transparency and accountability- Score 51.7/100***

According to DSK, their projects have to abide by the water quality protocol set by the donor, WaterAid. The water sample is tested for fecal coliform before handing over the project. However, the CBO is unaware of any monitoring mechanism in place. According to the LIC residents' survey, only 25% of the respondents mentioned that the service providers make information (including financial and procurement matters) clear to the respondents. According to the beneficiaries interviewed, no information regarding cost or performance is disclosed to them.

The CBO also claimed that if any beneficiary faces any problem, they inform the CBO. The CBO then reaches out to the NGO. If NGO does not provide any support, the CBO itself provides aid. However, according to the community leader interviewed, the CBO committee in this LIC area is inactive. People usually can't get any support from them. The CBO committee is formed by selection method from people outside the LIC but no one seems to place any complaint against these influential people who are practically inactive in running the committee. The community leader also alleged that mechanics who are appointed to monitor and conduct repairs sometimes intentionally damage the water supply lines because they know the LIC dwellers will approach them to fix it.

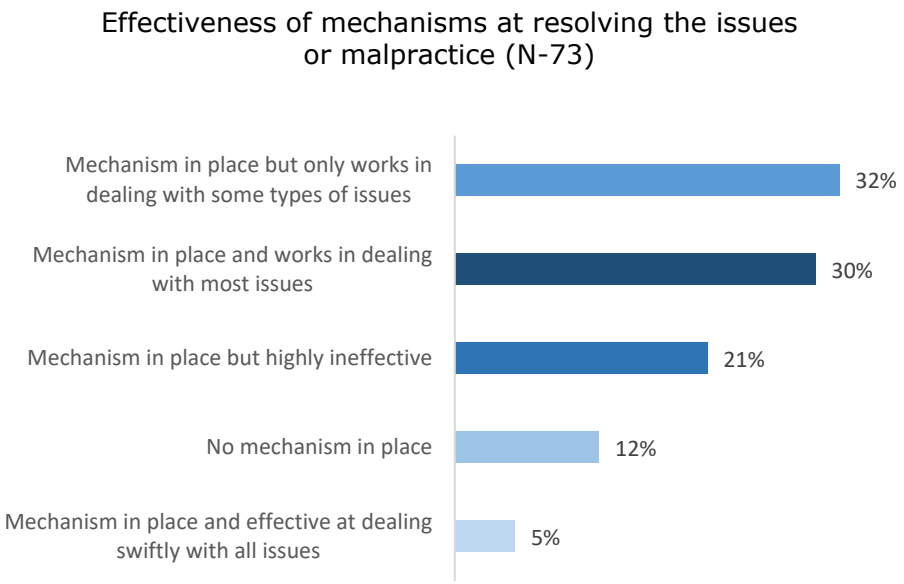



*Figure 35 Non-WOP CBO-S1 Effectiveness of Complaint Mechanism*

According to the LIC residents' survey, 88% of the respondents mentioned that there is a complaint mechanism in place. The beneficiaries interviewed mentioned that the complaint mechanism is informal and unwritten. 21% of surveyed beneficiaries mentioned that the mechanism is highly ineffective while another 12% said there is no mechanism in place.

***Capacity- Score 40/100***

According to the interview with the CBO, meetings in the area are usually organized by NGO/DSK and CBO. DSK used to provide training to the CBO in the beginning of the project. According to DWASA interview, DWASA does not have any training sessions for the CBO and neither had any plans or budget provisions to this end. According to DSK, they provide training on leadership, financial management and technical aspects to the CBO to increase their capacity. However, no need assessment is done as of record.

***Learning and knowledge management- Score 60/100***

According to the CBO, the committee members conducted sessions to educate the residents on maintenance, management, water storage and hygiene-related issues. During COVID-19, they tried to educate the LIC dwellers on the importance of washing hands with soap repeatedly. Interviews with DSK and the DWASA MODS Zone 10 staff suggests there is a structured exchange of information at monthly status meetings between DWASA and local implementing NGOs (spearheaded by DSK), for discussing issues in service provision to LICs. However, these meetings are mostly reactive in nature and hardly used for proactive risk management that takes into account past learnings. In addition to these meetings, it is common for most larger project stakeholders (donors and leading NGOs) to host workshops and knowledge sharing events (which are planned ahead and budgeted for) as part of their overall project plans, which allow for a degree of reflection.

***Harmonization and alignment- Score 67.5/100***

Secondary information and primary interviews with NGOs have revealed multiple LIC water service delivery models (covered under this study) that are being utilized in Dhaka city in terms of technology and business model. Out of these various models, the CBO-led approach is the one most clearly preferred by DWASA, as it is a tested model with 6,617 water points connecting approximately 156,000 families to water service as of September 2020. As a consequence, there is a clearly proven CBO model (with a considerable knowledge base) that is uniform and ready for adoption by any other organization choosing this route for establishing new connections.

According to the interview with NGOs, there are regular project-based information exchange sessions between the WASH stakeholders, however, these are also mostly centered on the CBO-model and does not fully incorporate lessons from the perspective of NGOs and operators belonging to a different model of service provision, leaving further room for inclusion and harmonization of the models.

***Environment- Score 75/100***

According to WaterAid, they are the ones who do formal environmental and social impact assessment prior to site selection. DSK, the implementing NGO, does not conduct a formal environmental and social impact assessment prior to the setup of the project in the area. However, they do discuss the issues verbally with the community and make necessary alterations to their plans. According to all IDIs with beneficiaries, lines are set up after checking social and environmental aspects in consideration that they are not detrimental to anyone - and corrective measures are taken after findings.

***Quality of service- Score 63.8/100***

According to the community leader interviewed, there are water supply shortage among few water lines. Those who are engaged in illegal water supply business often try to create artificial crisis. According to the CBO interview, they only get water for 20-30 minutes at night after 10-11 pm. Furthermore, they mentioned that even though they are not getting water they are paying a service charge of BDT 250 per month as a service charge.

According to the LIC residents' survey, 77% of the respondents mentioned that the supply from the LIC system is sufficient to meet the requirements by the end-users. Additionally, 64% of the respondents mentioned that the water provided in the LIC is available throughout the day (24/7). However, 12% of survey respondents mentioned that they face service downtime every day.

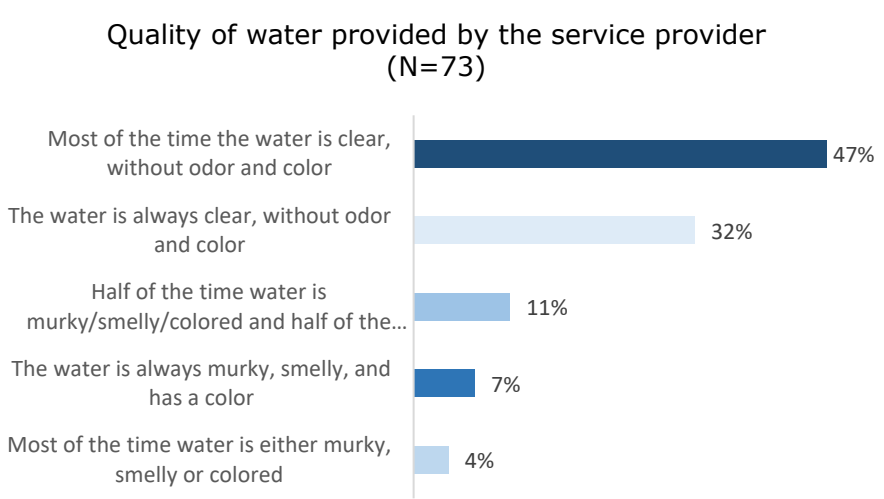



*Figure 36 Non-WOP CBO-S1 Water Quality*

According to community leader, the legal water supply line can't provide adequate water. As a result, they need to rely on illegal water lines. According to the study, 41% of the

respondents mentioned that the repairs are done within 24 hours while 37% stated that it is not done within 24 hours. According to the CBO interview, each household is charged BDT 300-350 per month. Subsequently, according to the LIC residents' survey, 77% of the respondents mentioned that they can afford to pay for the water tariff every month. While 15% mentioned that they cannot afford to pay at all.

### 3.5.3. Prevailing Issues and Risk Assessment

The biggest threat the Satellite LIC-S model faces is from that of illegal water suppliers, who have been known to sabotage the CBO lines and driven beneficiaries to a point where they have to resort to illegal lines due to poor quality of service. This puts the water service at real risk of extinction, unless local law enforcement agencies and DWASA can be engaged to mitigate this eventuality.

In addition, the site also demonstrated major threats faced commonly by CBO-led models including declining proficiency of CBOs, financial uncertainty due to a lack of external financial support, as well as the threat of rising DWASA water tariffs rendering users unable to meet payment obligations.

The following table identifies the main risks that were identified for the Non-WOP CBO partnership model, as it relates to the Satellite LIC (Storage):

*Table 22 Non-WOP CBO-S 1 Risk Assessment*

| Sl. | Description of Risk | Remarks on Prevailing Situation | Risk Category | Probability | Impact | Score |
|---|---|---|---|---|---|---|
| 1 | Users who are not satisfied with the water quality, daily downtimes and rising tariffs may be compelled to shift illegal lines | Water sufficiency from regular supply disruption is an issue. There are numerous illegal lines operating in the area but authorities have not been active in terminating these lines | Political Risk | 3 | 3 | 9 |
| 2 | Threat of resident eviction from LICs | Not a probable threat, but the risk is still moderate | Political Risk | 2 | 3 | 6 |
| 3 | Risk of service bottlenecks due to unforeseen capital expenses and capacity increases | Capital expenses are not thought to be the major threat compared to other external threats. Fund is maintained by CBO. However, CBO is highly inactive. | Investment Risk | 2 | 3 | 6 |
| 4 | Discontinuation of BCC programs lead to decline in customer demand | BCC programs were carried out earlier and moderately effective | Operational Risk | 2 | 2 | 4 |
| 5 | Insufficient capacity (daily downtimes) persists leading to customer attrition | Daily downtime now accepted as part of service by users, leading to almost half of users using an alternative source | Operational Risk | 3 | 2 | 6 |
| 6 | DWASA is unresponsive to complaints regarding | DWASA has not been able to fully resolve complaints regarding poor water | Operational Risk | 3 | 2 | 6 |

| Sl. | Description of Risk | Remarks on Prevailing Situation | Risk Category | Probability | Impact | Score |
|---|---|---|---|---|---|---|
| | water quality/ contamination | quality. CBO is highly inactive. | | | | |
| 7 | Skills and performance of CBO declines as external partners phase out training and capacity building programs | CBO was trained by NGO earlier but remains distant to users. | Operational Risk | 3 | 2 | 6 |
| 8 | Annual tariff increases by DWASA persists and makes tariff unaffordable to LIC residents, resulting in CBO unable to meet tariffs payments | Tariffs have been rising annually for the past 3 years, however most beneficiaries can afford the service as it is | Tariff Risk | 3 | 2 | 6 |
| 9 | Ageing infrastructure requires high maintenance and capital replenishment costs, which cannot be met with contributions from LIC residents | So far maintenance costs have been sourced from some users but no large replenishment was required | Financial Risk | 2 | 3 | 6 |
| 10 | The CBO signatory may relocate or otherwise by unable to perform his/her duties without a formal transfer of power, leaving the CBO unable to access retained funds from the CBO bank account. | NGOs such as DSK are working to update CBO model with contingencies in case the signatory becomes unavailable | Financial Risk | 1 | 2 | 2 |
| 11 | Daily water wastage when clearing out dirty/ contaminated water from the LIC network system. | Not applicable | Environmental Risks | | | |
| 12 | Donor funding comes to an end and impedes operational and/or capital expenditures | CBO models is designed to operate independently of donors but the already existing bottlenecks make it a severe issue | Financial Risk | 3 | 3 | 9 |
| 13 | DWASA funding comes to an end and impedes operational and/or capital expenditures | Not applicable as DWASA does not cover any O&M costs for this model | Financial Risk | | | |
| 14 | Local political opposition impedes service provision in the LIC/locality | Local illegal line providers and political groups have been known to sabotage the line's operation | Political Risk | 3 | 3 | 9 |
| 15 | DWASA settles on single modality for water service provision to LICs | Not a threat as CBO models and Water ATM models are the formally approved approaches | Regulatory Risk | 1 | 1 | 1 |

## 3.6. CBO-S (Storage) Model: City Polli LIC Line with reservoir

### 3.6.1. Site observations:

City Polli is located in Dholpur area of the southern part of Dhaka city. The LIC falls under the Dhaka South City Corporation. This LIC houses around 3,250 residents. This site was selected as the only LIC representation of Dhaka South (the ATM-C site is also from Dhaka South but not located within an LIC). SAJIDA Foundation is actively operating in the area with the help of CBO. The first CBO in the region was formed in 1998. However, the current board has been active for the past 6-7 years. The total number of respondents surveyed from City Polli was 65. The majority (82%) of the respondents were female while males were only 18%. Among the total respondents, only 6% belonged to the religious minority group.

*Figure 37 Non-WOP CBO-S2: City Polli LIC Water Point*

The CBO in the area reached out to SAJIDA Foundation for legalization of their existing network. The total number of CBO members is 9, and members were selected based on discussion among the community members. The water connection they are getting from DWASA is 500-1,000 feet away which is making it not feasible for them to get proper access to water. According to the LIC respondents, 40-50 families are grouped together and 1 tank is assigned to them after agreeing to bear the operating expenses and water bill of the tank.

### 3.6.2. Dimensions of the Assessment system

***Policy, legislation and institutions- Score 65.5/100***

Almost two-third of the LIC users (65%) stated that they were aware of the level of services they should be receiving from the CBO. However, this was expressed in non-technical terms such as "good quality", "clean" or "always available" water service - this is to be expected since the CBO does not have an official charter for LIC residents promising a certain specification of water quality, which limited service professionalization.

CBOs, on the other hand, seemed clear about their roles and responsibilities. However, a large section (65%) of the respondents believed that the CBO was either not qualified for their role or did not have the proficiency needed for performing certain tasks.

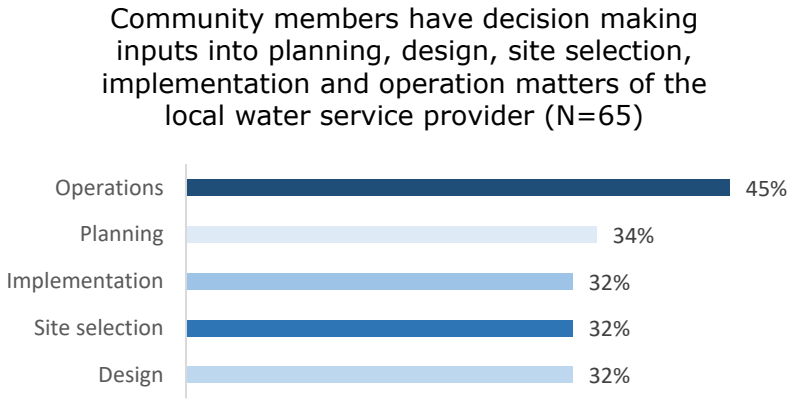



*Figure 38 Non-WOP CBO-S2 Community Input in Decision Making*

Before starting the project, 28% of the respondents were not consulted in decision making of the location and/or type of water point. Only 55% of the respondents indicated that there is a complaint mechanism in place, although it was not very effective.

For legalization of water points, SAJIDA Foundation follows the CBO model (similar to models followed by DSK in projects funded by WaterAid). DWASA offers full recognition and empowers CBOs to legally represent and take up community water points in LICs. The CBOs can place their queries to the representatives of DWASA.

***Financing for life-cycle costs- Score 40/100***

The majority (78%) of the respondents stated that they do not pay separately for the operation and maintenance fund for the water points, 18% mentioned that they can pay for the fund on a regular basis, while the rest of them could not afford to pay any money for the fund. There is no set/well-structured mechanism in place to provide finance for the CAPEX.

According to the CBO interview, they have a fund under the CBO. Every month after paying the water bill, the CBO puts the remaining amount (BDT 100-200) into the fund for future purposes. They further predict average monthly maintenance expense to be around BDT 100 per family. Furthermore, when the maintenance fund is not enough to cover the expense, the CBO contributes personally or takes loans. Lastly, only a fragment of the respondents (5%) believes that the complaint mechanism in place in effective.

***Planning- Score 40/100***

According to the SAJIDA, a user interested for legalization will submit their demand to SAJIDA Foundation. Followed by that, they arrange a consultation meeting with the CBO in the area and the new potential user. After receiving the demand note, SAJIDA Foundation's engineer inspects the area and prepares a cost-analysis and is shared with the user. It takes 10-12 days for getting everything approved by DWASA.

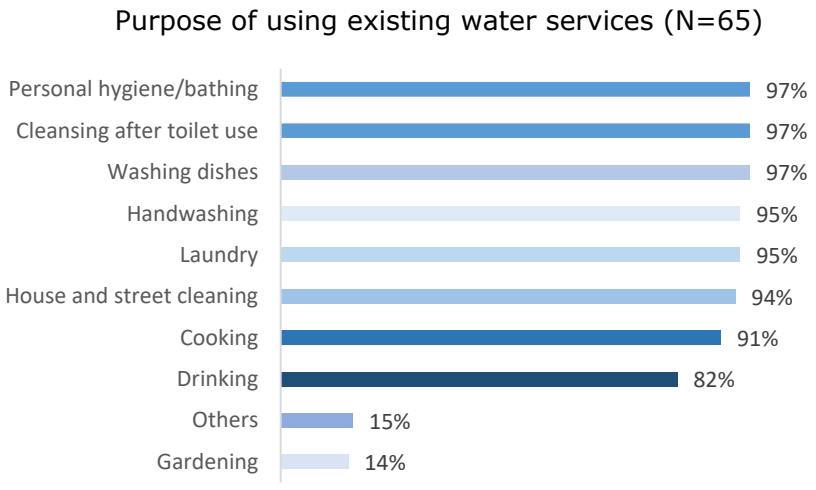



*Figure 39 Non-WOP CBO-S2 Purpose of using existing water source*

According to the beneficiaries interviewed, two thirds of them were consulted regarding planning/decision making. However, they all agree it is not inclusive and that women, children, elderly disabled and ethnic minorities are largely ignored having only the head of family's opinion being taken. It should be noted here that most LIC population across Dhaka are not stable, with tenants moving from place to place due to changes in employment and lifestyle etc., which is why most CBO models rely on landowner representation in CBOs.

The majority of LIC respondents (82%) use the water from the service provider for drinking purposes and as well as for other household chores. 29% of surveyed respondents use other sources of water to satisfy their demand for water. However, as per the interview with the CBO and the LIC residents, no assessment or survey were conducted prior to the project which would identify the scope of multiple water uses from the water points. Additionally, according to the CBO interview, they have a separate line for men and women. However, 38% of the beneficiaries mentioned that the water points are not accessible for everyone.

Furthermore, according to beneficiaries interviewed; some NGOs run awareness generation programs from time to time including SAJIDA Foundation. As for SAJIDA Foundation's software activities, they work on providing sessions on awareness raising regarding handwashing, menstrual hygiene management, water saving plant. They provided handwashing devices to LICs and also worked on disinfecting the LIC areas. According to the CBO, they have illegal lines available in the area. However, the CBO is unable to take any steps for fear of influential people.

***Transparency and accountability- Score 45/100***

According to the CBO interview, they can place complaints regarding the water quality to the DWASA representative bringing in a water bill or if any representative comes to look over the service in the area. They also mentioned that DWASA prioritizes the service after receiving their complaint.

Furthermore, according to the LIC residents' survey, only 23% of the respondents mentioned that service providers make information (including financial and procurement matters) available to them and other stakeholders. Furthermore, 55% of the respondents stated that there is a complaint mechanism in place for reporting issues in service delivery or malpractices. Only 20% of respondents think that the complaint mechanism in place is highly ineffective.

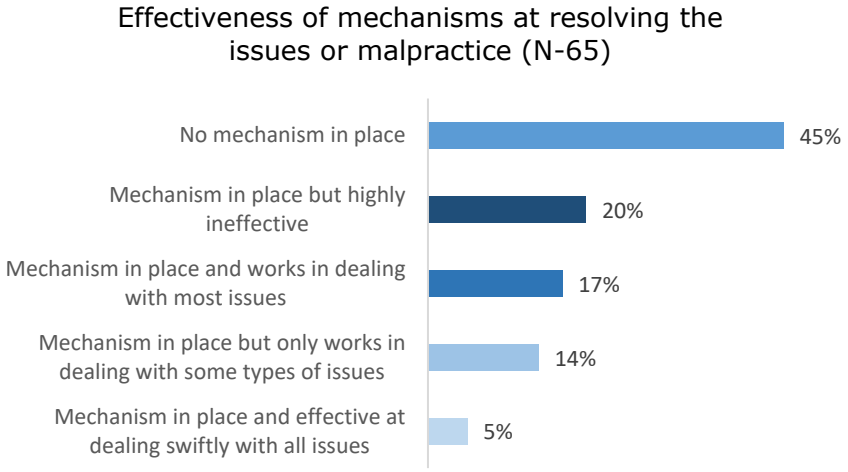



*Figure 40 Non-WOP CBO-S2 Effectiveness of Complaint Mechanism*

***Capacity- Score 30/100***

According to the CBO interview, they receive training from SAJIDA Foundation and multiple other NGOs regarding raiding awareness in the area. All the training sessions are funded by the NGOs. Furthermore, SAJIDA Foundation organizes campaigns for hygiene awareness, according to the CBO interview. According to DWASA interview, DWASA itself does not have any training sessions for CBOs and neither had any plans or budget provisions to this end.

***Learning and knowledge management- Score 80/100***

According to beneficiaries interviewed, meetings, consultations, backyard meetings, training workshops are conducted by various NGO and CBO committees at the neighborhood level or by area basis. Interviews with SAJIDA Foundation and the DWASA MODS Zone 1 staff suggests there is a structured exchange of information at monthly status meetings between DWASA and local implementing NGOs, for discussing issues in service provision to LICs. However, these meetings are mostly reactive in nature and hardly used for proactive risk management that takes into account past learnings. In addition to these meetings, it is common for most larger project stakeholders (donors and leading NGOs) to host workshops and knowledge sharing events (which are planned ahead and budgeted for) as part of their overall project plans, which allow for a degree of reflection.

***Harmonization and alignment- Score 70/100***

Secondary information and primary interviews with NGOs have revealed multiple LIC water service delivery models (covered under this study) that are being utilized in Dhaka city in terms of technology and business model. Out of these various models, the CBO-led approach is the one most clearly preferred by DWASA, as it is a tested model with 6,617 water points connecting approximately 156,000 families to water service as of September 2020. As a consequence, there is a clearly proven CBO model (with a considerable knowledge base) that is uniform and ready for adoption by any other organization choosing this route for establishing new connections.

According to the interview with NGOs, there are regular project-based information exchange sessions between the WASH stakeholders, however, these are also mostly centered on the CBO-model and does not fully incorporate lessons from the perspective of NGOs and operators belonging to a different model of service provision, leaving further room for inclusion and harmonization of the models. Additionally, as this is an ongoing project, the stakeholders are actively involved with the process.

***Environment- Score 75/100***

SAJIDA Foundation mentioned that they perform a social and environmental impact analysis before starting a new project. However, it is done informally/verbally. Any issued identified through the process is solved through discussion in the consultation meeting with the CBO. Furthermore, according to two out of three beneficiary IDIs, before installing the water line NGOs or CBOs check and choose the environmental and social aspects. Out of these two people, one said that committee does not take any corrective action after examining the impact of social and environmental aspects.

***Quality of service- Score 45/100***

Around two third (65%) of the respondents mentioned that the water provided by the service provider is sufficient to meet the requirements of the end-users. Furthermore, 65% of the LIC respondents mentioned that the water provided in the LIC is available throughout the day (24/7). According to the LIC residents' survey, 42% of the respondents mentioned that the water is either always or mostly murky, smelly or colored. However, according to two out of three beneficiary IDIs, the water is usually good (was very good in the beginning) but now quality is sometimes bad. Despite insects sometimes coming up with the water, and that sometimes the taste of the water is bad, it was thought to be better than other comparable lines. On the other hand, according to the CBO interview, the water supply is often disrupted and there is no set timing for the supply to be off. Furthermore, they mentioned that the water quality is usually well, however, sometimes the quality is extremely poor.

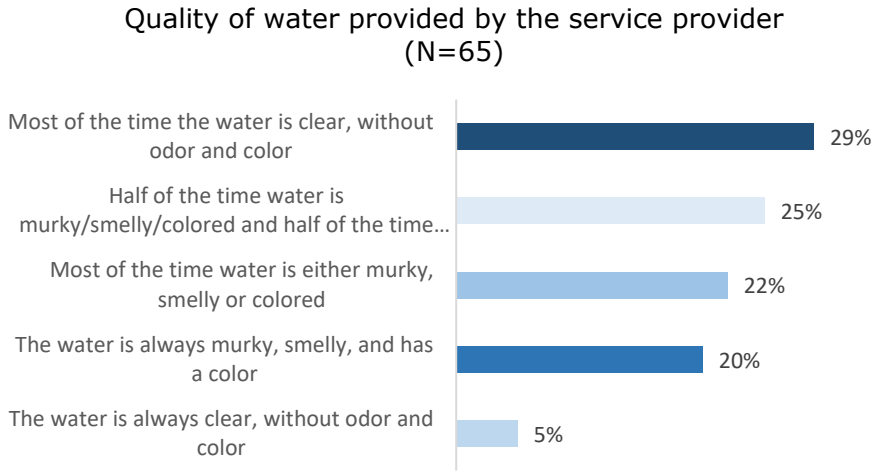



*Figure 41 Non-WOP CBO-S2 Water Quality*

All beneficiaries interviewed stated that water line is usable for all. A separate house has been set up for the elderly, teenagers, women or pregnant women by SAJIDA Foundation which helps everyone to use the line effortlessly. However, only 62% of the survey respondents stated that the water points can be assessed by everyone.

26% of the respondents stated that they cannot afford to pay for the water tariff every month. According to the LIC residents' survey, 40% of the respondents stated that they face supply interruptions less than one day per month. Another 35% mentioned that they face supply interruptions on one or two days a month. Among them, 43% of the respondents mentioned that the repairs are generally completed within 24 hours. However, 49% of them stated that the repairs are not generally completed within 24 hours.

### *3.6.3. Prevailing Issues and Risk Assessment*

Compared to the Satellite LIC CBO-S site, the City Polli CBO-S site faces fewer prominent threats, possibly attributable to it being an ongoing project with continuing external support. The skills and proficiencies of the CBOs remain and their distance from beneficiaries is a key concern in this site as well, with mitigation measures such as regular refresher trainings recommended.

Otherwise, like other CBO-led models, it is also susceptible to rising water tariffs, however it is not clear if landowners will pass on any expected tariff increases on to consumers.

The following table identifies the main risks that were identified for the Non-WOP CBO partnership model, as it relates to the City Polli LIC (Storage):

*Table 23 Non-WOP CBO-S 2 Risk Assessment*

| Sl. | Description of Risk | Remarks on Prevailing Situation | Risk Category | Probability | Impact | Score |
|---|---|---|---|---|---|---|
| 1 | Users who are not satisfied with the water quality, daily downtimes and rising tariffs may be compelled to shift illegal lines | There are still illegal lines operating in the area but authorities have not been active in terminating these lines. A significant portion of users already use multiple water sources | Political Risk | 2 | 2 | 4 |
| 2 | Threat of resident eviction from LICs | Not a threat at present | Political Risk | 1 | 3 | 3 |
| 3 | Risk of service bottlenecks due to unforeseen capital expenses and capacity increases | There are often interruptions during noon and morning and affecting water sufficiency | Investment Risk | 2 | 2 | 4 |
| 4 | Discontinuation of BCC programs lead to decline in customer demand | Awareness raising events are held from time to time and beneficiaries find them to be useful | Operational Risk | 1 | 2 | 2 |
| 5 | Insufficient capacity (daily downtimes) persists leading to customer attrition | Daily downtime now accepted as part of service by users, attributed to high water demand in peak hours | Operational Risk | 3 | 2 | 6 |
| 6 | DWASA is unresponsive to complaints regarding water quality/ contamination | DWASA has not been able to fully resolve complaints regarding poor water quality | Operational Risk | 2 | 2 | 4 |
| 7 | Skills and performance of CBO declines as external partners phase out training and capacity building programs | CBO was trained by NGO earlier but remains distant to users. | Operational Risk | 3 | 2 | 6 |
| 8 | Annual tariff increases by DWASA persists and makes tariff unaffordable to LIC residents, resulting in CBO unable to meet tariffs payments | Tariffs have been rising annually for the past 3 years and a large section of residents have difficulty affording present water rates | Tariff Risk | 3 | 3 | 9 |
| 9 | Ageing infrastructure requires high maintenance and capital replenishment costs, which cannot be met with contributions from LIC residents | So far maintenance costs have been sourced from users but no large replenishment was required | Financial Risk | 2 | 2 | 4 |
| 10 | The CBO signatory may relocate or otherwise by unable to perform his/her duties without a formal transfer of power, leaving the CBO unable to access retained funds from the CBO bank account. | NGOs such as DSK are working to update CBO model with contingencies in case the signatory becomes unavailable | Financial Risk | 1 | 2 | 2 |
| 11 | Daily water wastage when clearing out dirty/ | Not applicable | Environmental Risks | | | |

| Sl. | Description of Risk | Remarks on Prevailing Situation | Risk Category | Probability | Impact | Score |
|---|---|---|---|---|---|---|
| | contaminated water from the LIC network system. | | | | | |
| 12 | Donor funding comes to an end and impedes operational and/or capital expenditures | CBO models is designed to operate independently of donors and this CBO has a moderate fund to cover immediate capital expenditures | Financial Risk | 2 | 2 | 4 |
| 13 | DWASA funding comes to an end and impedes operational and/or capital expenditures | Not applicable as DWASA does not cover any O&M costs for this model | Financial Risk | | | |
| 14 | Local political opposition impedes service provision in the LIC/locality | Some level of opposition is expected from purveyors of illegal water lines | Political Risk | 2 | 2 | 4 |
| 15 | DWASA settles on single modality for water service provision to LICs | Not a threat as CBO models and Water ATM models are the formally approved approaches | Regulatory Risk | 1 | 1 | 1 |

## 3.7. Social Enterprise Model: Bhashantek

### 3.7.1. General observations:

Bhashantek LIC falls under MOD zone 10 of DWASA in the Mirpur region of Dhaka City with around 5,500-6,000 households housing more than 20,000 residents. Water and Life have been present in Dhaka since 2012. The sponsor, Water and Life, mainly designs and develops the program, figuring out the potential sectors for implementation. The next step is to make the community aware of their proposed services. After the system is designed, developed, and constructed, it is handed over to Shobar Jonno Pani (SJP), the social enterprise founded by Water and Life, who implements the model and conducts regular maintenance activities. Pilot service started in the Bhashantek area in 2012 and network development started in 2014. SJP currently has 2,000 client household connections with only a few inactive members.


*Figure 42 Social Enterprise Model: Bhashantek Water Points*

Owing to constraints in gaining access to beneficiaries, the total number of respondents surveyed from Bhashantek was only 14. Furthermore, access to those respondents were granted through the operator, SJP, and was composed of mainly SJP who are also users of the SE service. Therefore, the make-up of the respondents may have had an impact in the impartiality of the responses received.

### 3.7.2. Dimensions of the Assessment system

The SE model achieves its highest scores in the *Policy, legislation and institutions* dimension due to its strong community engagement and service professionalization, despite the uncertainty surrounding the future of the model in future sites. The model scores a high score in the *Quality of Service* dimension as the respondents found the water to be clean on most hours of the day.

The model also scores highly in the Transparency and Accountability dimension owing to positive beneficiary feedback and along the Environment dimension, benefiting from donor-lend initiatives to take into consideration social and environmental factors prior to establishing the water service delivery.

However, the models score relatively weakly in the *Capacity* dimension due to not engaging with DWASA on training programs to build capacity of the utility provider. It also scores low in the *Learning and Knowledge Management* dimension, being the only example of SE model identified in operation in Dhaka city and thus having a smaller knowledge base to derive lessons from and limiting the scope to combine efforts from multiple driving organizations into a collective advocacy process.

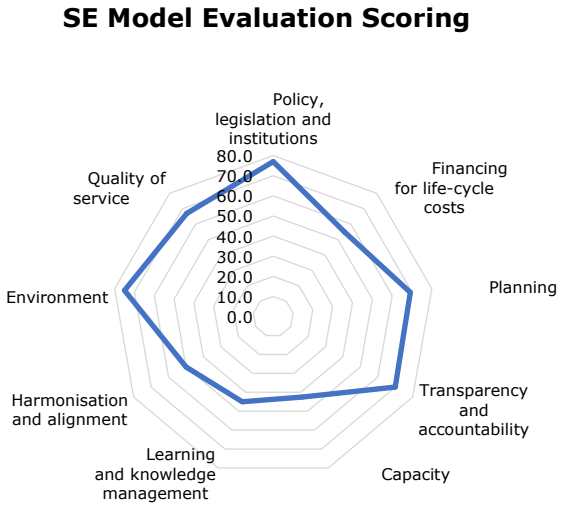



*Figure 43 SE Model Evaluation Scoring*

***Policy, legislation, and institutions- Score 77/100***

According to the survey, 100% of respondents are clear about the level of services they should be receiving from their service providers. Furthermore, 100% of the respondents were also consulted on the decision making of the location and/or the type of water points. Additionally, 100% of the respondents believe that the local water service provider is highly proficient. However according to two third of the beneficiaries interviewed; no opinion was taken from them regarding the choice of technology. It should be noted here that most LIC population across Dhaka are not stable, with tenants moving from place to place due to changes in employment and lifestyle etc., and tenants who responded may only have recently shifted to the LIC.

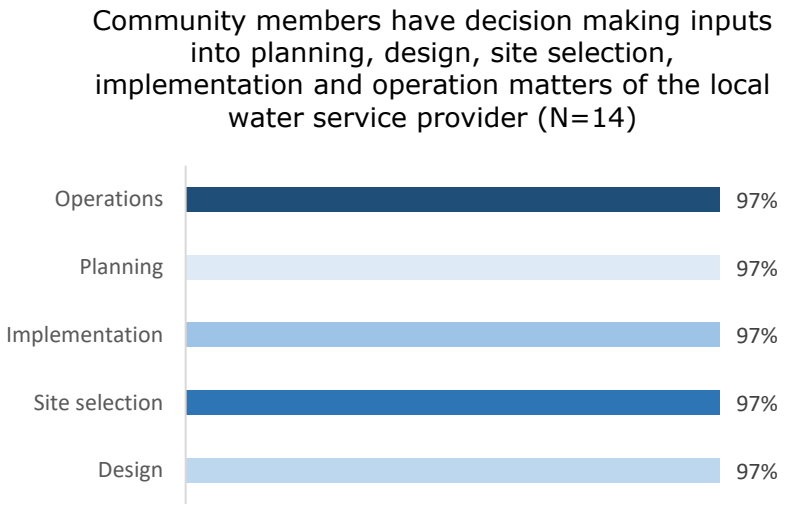



*Figure 44 SE Model Community Input in Decision Making*

Water and Life has an agreement with DWASA to supply water from the Bulk water meter to the household. Both DWASA and Water and Life are clear about the terms and conditions of the Memorandum of Understanding (MoU) between them. An MoU is necessitated as DWASA officially does not recognize service providers who purchase water and then sell it to higher prices to its users. To avoid this legal issue, SJP bills its users water tariff costs and operation and maintenance costs separately for services such as daily chlorination of water, water leakage management, etc.

The community people also sign an MoU with SJP, which is then submitted to DWASA to get DWASA service. Then, demand notes and security money are submitted to DWASA, following which DWASA provides its services. Furthermore, Water and Life have in place an MoU with SJP for project implementation. After the implementation of the project, SJP maintains the services in the area. They are responsible for providing the water service to

the households. They negotiate and communicate with the DWASA. To form structure and maintain the structure.

***Financing for life-cycle costs- Score- 55/100***

The cost of setting up new lines and distribution of lines to households is funded by Water and Life. According to beneficiaries interviewed, there is no repair and maintenance fund. If any repair is required on the customer's own line, the cost of that repair is paid by the customer himself or herself. But if there is any problem in the main line, its cost is borne by SJP, undertaken with funds from Water and Life. The customer does not pay into any regular fund or reserve for repairs or maintenance.

The cost incurred for providing a new connection to a household is 20,000 - 22,000 BDT. However, as SJP charges each household only BDT 800 for a new connection, the major portion of the connection cost is actually subsidized. The water tariff is 16.63 BDT, of which around BDT 12-13 is completely paid by the users, since SJP has been unable to increase tariff prices reflecting actual DWASA water tariffs in face of opposition from users. The difference is subsidized by Water and Life. In addition to the water tariff, customers are also billed for maintenance cost. The total payment charged from users is 36.68 BDT for 1,000 litres, which includes both water tariff and O&M costs. 20.05 BDT is the O&M cost per 1,000 liters of water supplied. This O&M charge from users covers only around 30% of the total O&M costs incurred, the rest being subsidized by Water and Life. Households are generally billed BDT 200-250 per month. According to SJP, there are illegal water connection providers in the area who are offering water to SJP's existing users for a lower price leading to SJP losing their active clients. Furthermore, SJP incurs bad debt owing to the switching clients not clearing their due amount. Additionally, as SJP is not being able to reach breakeven as they are not having adequate sales owing to the low consumption of water by their clients.

Water and Life also subsidize water expenses for some families (30-35 families) depending on their monthly income and financial condition. Capital expenditures are covered by Water and Life as required by the SJP (applied through formal procedure), and the goal is to bear this portion of expenses until the community members reaches a point where they are able to bear their own expense. They also provide free piped water service to public places such as schools, mosques, madrasas around the area.

***Planning- Score 69.2/100***

In the very initial stage, Water and Life (NGO) came to this area to conduct a survey in order to identify the basic need of the people. They approached the community leaders of the area and set up the network which is now used for supplying water.

According to the LIC user surveys, 100% of the users of the existing service use the water for drinking purposes. Only 7% of the respondents use other sources of water. 100% of those users use the water for personal hygiene/bathing purposes.

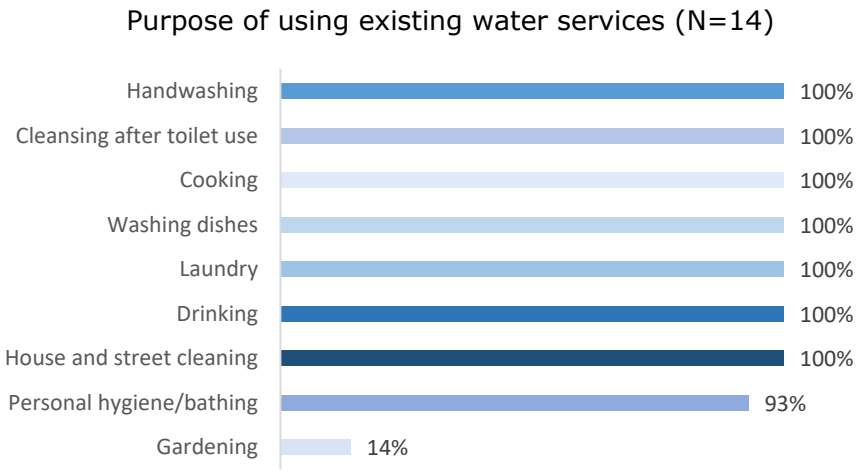



*Figure 45 SE Model Purpose of using existing water service*

Furthermore, SJP clients mostly use this water for drinking and cooking purposes and satisfies their other needs by using water from illegal connections for lower cost.

According to beneficiaries interviewed, hygiene promotion initiatives from Water & Life regularly reach every house by conducting awareness campaigns among the LIC dwellers to prevent water related diseases. SJP have separate staff for this activity and according to user surveys, these awareness and promotion initiatives are considered to be effective. According to the LIC residents' survey, 100% of the respondents mentioned that the water points are always accessible for everyone, which is to be expected since the lines are provided at the household level. Furthermore, Water and Life runs campaigns for raising awareness of drinking pure water. SJP also provides solid waste and sanitation services.

***Transparency and accountability- Score 70/100***

According to the survey, 100% of the respondents mentioned that there is a complaint mechanism in place to report issues in service delivery or malpractices. 100% of the respondents also believe that the mechanism is effective in all or most cases. According to SJP, customers can come directly to their office or call the dedicated hotline number to complain about water service problem or any other problem. In response to complaints, SJP's technical team staff visit the site to resolve the issue at hand.

86% of respondents stated that the information (including financial and procurement matters) is made clear to them. However, according to beneficiaries interviewed, costs incurred by SJP for repairs are not disclosed to customers and is an internal matter. Furthermore, SJP does not disclose any information related to their financial purchases to the customer.

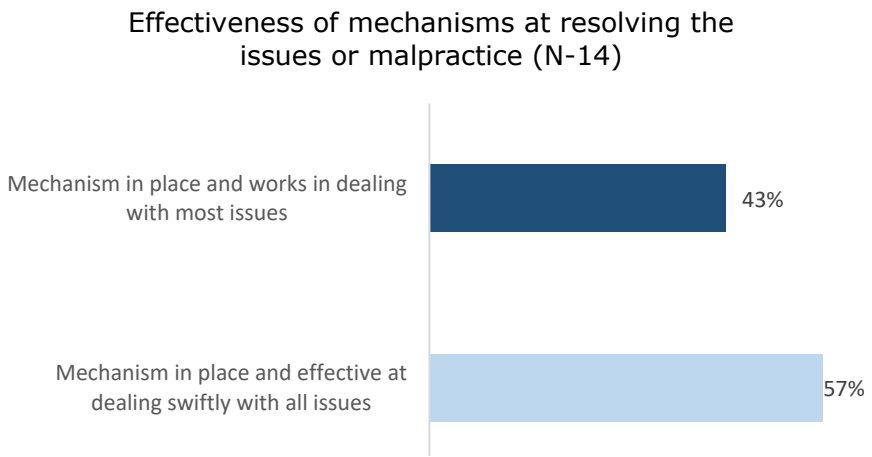



*Figure 46 SE Model Effectiveness of Complaint Mechanism*

Water and Life stay active in monitoring the area. Illegal water line tapping for pilfering water is a problem in Bhashantek LIC and DWASA has already been informed about this. However, even though DWASA occasionally respond by evicting some of these tapped lines in the presence of SJP/ Water and Life, this creates a negative perception in the mind of the community people about SJP and Water and Life from those who are affected by the eviction.

The funding NGO, Water and Life, feels it does not receive sufficient support from DWASA and there is a lot of room for improvement for DWASA.

***Capacity- Score 42.5/100***

According to beneficiaries interviewed, at the neighborhood level or in an area-wise manner, SJP organizes regular meetings and consultations. Furthermore, SJP performs mock drills every month for preventing accidents in the area. According to Water and Life, DWASA receives local and international training on capacity building, so they are deemed capable. However, the model scores low on the capacity development aspect for training DWASA. They also conduct on the job training for SJP, where Water and Life bears all training expenses.

***Learning and knowledge management- Score 45/100***

According to DWASA CPCR unit, knowledge, skills and experiences on LIC water services planning, implementation and operation are occasionally shared between stakeholders, particularly among those stakeholders operating under the CBO model and SE models. SJP is allowed to participate in these workshops in order for them to gather lessons from other CBO led models – even though all of the learnings may not be applicable from a social enterprise model.

***Harmonization and alignment- Score 50/100***

Although the WASH sector stakeholders coordinate with each other, the opportunities for collaboration are limited around their own models, with the exception of SE model, which benefits from the presence of SJP as a partner of the DWASA CPCR Unit, allowing them to draw on the advocacy power of the CBO models as well. As noted earlier, DWASA is however politically sensitive to users paying substantially higher rates than the tariff rate, which is why it prefers the CBO model over expansions of the SE model.

***Environment- Score 70/100***

Water and Life conducts environmental impact assessment before undertaking a new project and identified issues are solved through discussions and negotiation. Such environmental and social considerations revolve around which cluster a particular household will be connected from and how it benefits both the customer and SJP. However, no formal report is developed following the assessment. Engineers from SJP also develop and informal report based on which necessary actions are taken. If any expense is required to adjust for social and environmental factors, Water and Life pays for it.

***Quality of service- Score 66.9/100***

According to the survey, 100% of the respondents stated that the water supply from the LIC system available is sufficient to meet the requirements of the end-users. Furthermore, 100% of the LIC respondents mentioned that the water provided in the LIC is available throughout the day (24/7). However, according to interview with the LIC residents, service interruptions mostly happens during noon and afternoon. Additionally, even though 71% of the respondents mentioned that they do not face any service downtime, 14% mentioned

that they face service downtime every day and another 14% mentioned that they face it once a week.

According to the LIC residents' survey, 100% of the respondents mentioned that necessary repairs are generally completed within 24 hours. According to Water and Life, when there is severe water crisis for 2-3 days straight from DWASA, Water and Life provides water practicing rationing to the community (2-3 hours a day). Furthermore, whenever there is a service interruption it is completed within 24 hours. It usually takes 7-8, however, it takes longer when there is paperwork involved.

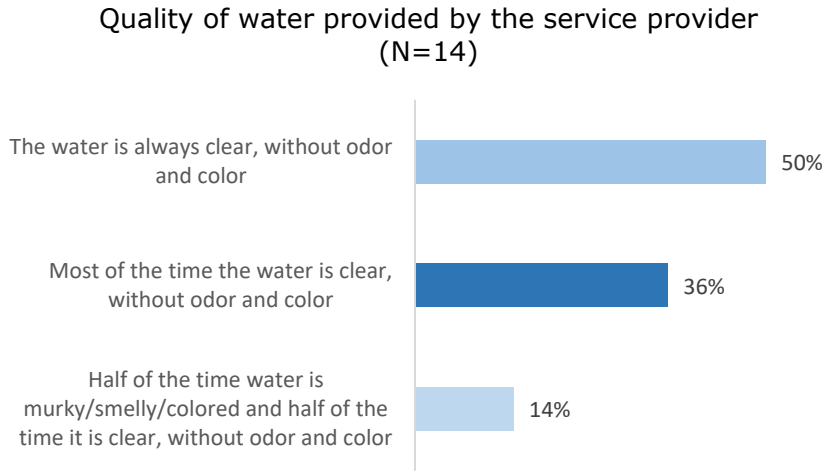



*Figure 47 SE Model Water Quality*

According to SJP, DWASA provides water from 8 pm-12 pm. They supply water in a rationing system. They provide water to the East side from 12 pm-8 pm as a result of which the water pressure is weak. After DWASA is done with the supply, the clients get water up till 2-3 pm from the overhead tanks (OHTs) of the network. According to all beneficiaries interviewed; water is unavailable from noon to evening (12 noon to as late as 9pm every day). According to beneficiaries interviewed, the time needed to fix water connection issues depends on whether SJP office is open. If SJP office is not open, it can take between 1 or 2 days to get fixed by SJP technical staff. Lastly, according to the LIC residents' survey, 100% of the respondents mentioned that the water points are always accessible for everyone, which is to be expected since the lines are provided at the household level.

### *3.7.3. Prevailing Issues and Risk Assessment*

As the model has not reached financial independence, the main threats to the SE model are a decline in the service performance and inability to extend new service connections that may arise from interruptions in external funding from donors. Annual tariff increases from DWASA also threatens to put further pressure on a model which has not been able to charge users fully for the cost of services incurred. To become a self-sustained model, the SE model should look for opportunities to increase operational efficiency, or maximizing its revenue base (perhaps by enhancing its coverage to the full LIC population to achieve economies of scale) or by passing on a larger share of costs to their beneficiaries. But the biggest threat facing the model is a contextual one – the model face severe disruptions from vested political groups within the LIC, that threaten the long-term operation of the model. This is an issue that will require close involvement and backing from law enforcement agencies and local political groups to resolve.

The following table identifies the main risks that were identified for the Social Enterprise model, as it relates to the Bhashantek site:

*Table 24 SE Model Risk Assessment*

| Sl. | Description of Risk | Remarks on Prevailing Situation | Risk Category | Probability | Impact | Score |
|---|---|---|---|---|---|---|
| 1 | Users who are not satisfied with the water quality, daily downtimes and rising tariffs may be compelled to shift illegal lines | There are several illegal lines operating in the area and authorities have not been active in terminating these lines, putting SJP line at risk. Many of SJP's existing clients are shifting to illegal water connection due to better water pressure. | Political Risk | 2 | 2 | 4 |
| 2 | Threat of resident eviction from LICs | Not a probable threat at present | Political Risk | 1 | 3 | 3 |
| 3 | Risk of service bottlenecks due to unforeseen capital expenses and capacity increases | Lack of storage has been flagged as a bottleneck but new reservoir expected to go into operation; high dependence on donor funding for establishing new connections. High service level means repair costs are especially high | Investment Risk | 2 | 3 | 6 |
| 4 | Discontinuation of BCC programs lead to decline in customer demand | BCC programs are held and thought to be highly effective | Operational Risk | 1 | 2 | 2 |
| 5 | Insufficient capacity (daily downtimes) persists leading to customer attrition | Daily downtime now accepted as part of service by users, however this does not affect water sufficiency status. SJP is failing to reach anticipated water consumption level from users, leading to revenue shortfall. | Operational Risk | 3 | 1 | 3 |
| 6 | DWASA is unresponsive to complaints regarding water quality/ contamination | No risks were faced in terms of DWASA engagement as water treatment is done independently | Operational Risk | 2 | 2 | 4 |
| 7 | Skills and performance of operator declines as external partners phase out training and capacity building programs | On the job training is provided to employees, however attrition is expected if donor funding is at risk | Operational Risk | 3 | 2 | 6 |
| 8 | Annual tariff increases by DWASA persists and makes tariff unaffordable to LIC residents, resulting in CBO unable to meet tariffs payments | Tariffs have been rising annually for the past 3 years but even full tariff costs are not charged from users, putting in doubt the transference of future price increases on users resulting in low chances of self-sustainability | Tariff Risk | 3 | 3 | 9 |
| 9 | Ageing infrastructure requires high maintenance and capital replenishment costs, which cannot be met with contributions from LIC residents | So far maintenance costs have been sourced entirely from donors, which is a risk if donor funding runs out. High service level means repair costs are especially high. Moreover, | Financial Risk | 2 | 3 | 6 |

| Sl. | Description of Risk | Remarks on Prevailing Situation | Risk Category | Probability | Impact | Score |
|---|---|---|---|---|---|---|
| | | large dues are outstanding from many users. | | | | |
| 10 | The CBO signatory may relocate or otherwise by unable to perform his/her duties without a formal transfer of power, leaving the CBO unable to access retained funds from the CBO bank account. | Not Applicable | Financial Risk | | | |
| 11 | Daily water wastage when clearing out dirty/ contaminated water from the LIC network system. | Not Applicable | Environmental Risks | | | |
| 12 | Donor funding comes to an end and impedes operational and/or capital expenditures | SJP's field force and supporting departments depend on donor funding to function, which has been stable so far | Financial Risk | 2 | 3 | 6 |
| 13 | DWASA funding comes to an end and impedes operational and/or capital expenditures | Not applicable as DWASA does not cover any O&M costs for this model | Financial Risk | | | |
| 14 | Local political opposition impedes service provision in the LIC/locality | Opposition from local political groups greatly impede operations and has put future expansion plans in the face of threat | Political Risk | 3 | 3 | 9 |
| 15 | DWASA settles on single modality for water service provision to LICs | Could a potentially debilitating threat if DWASA opts not to allow replication of the SE model, but such a decision will not impact this specific site greatly | Regulatory Risk | 2 | 2 | 4 |

## 3.8. Non-Commercial Water ATM Model: Robidashpara

### 3.8.1. General observations:

The Robidashpara LIC lies near Old Dhaka which falls under the Dhaka South City Corporation. This location was selected due to being the only active non-commercial water ATM model inside Dhaka. The total population in this LIC is 2,000 residents belonging to 181 households. The total number of respondents surveyed from the LIC is 70. However, the respondents surveyed are not solely the users of the water ATM, but also the water points active in their area. Hence, there responses received from respondents also related to the CBO-led water point as well as the Water ATM point managed by the same CBO. Most of the residents among the LIC residents those were surveyed are followers of the Hindu religion.


*Figure 48 NC Water ATM: Robidashpara Water ATM*

SAJIDA Foundation brought in water lines from DWASA, which is an exception to their 'only legalization of water networks' service. However, the funding was covered by the LIC members. Subsequently, DSK with the funding from Plan International set up a water ATM in this area (the technology was sourced from an external vendor) with the aim of providing access to safe drinking water to the LIC residents.

The total number of CBO members is 9 (1 President and 8 members). The CBO was formed upon the agreement of all the family representatives in the society.

### 3.8.2. Dimensions of the Assessment system

The Robidashpara ATM-NC model performs in the lower half of the scale across most dimensions. It is relatively stronger in the *Environment* dimension, benefiting from donor-lend initiatives to take into consideration social and environmental factors prior to establishing the water service delivery.

Being the only ATM-NC in operation in Dhaka, with two other ATM-NC booths being shut down, the model does not have enough examples to draw lessons from (weak *Learning and Knowledge Management* score) and faces challenges in H*armonization and Alignment* as a consequence because it is not a prioritized model among DWASA and other stakeholders. Indeed, the sponsor for the project, Plan International, is not active at present in Dhaka city LICs, leading to lower advocacy scores. From interaction with beneficiaries it can be inferred that multiple uses of the water or alternative water use planning was not integrated in the project's plan, leading to lower *planning* scores.

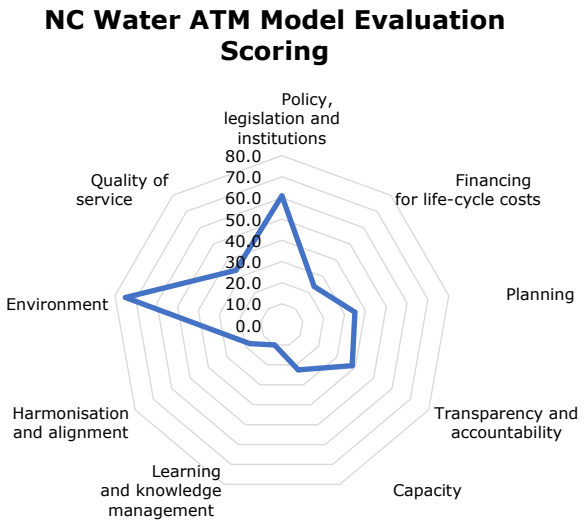



*Figure 49 NC Water-ATM Model Evaluation Scoring*

The model is also weak in the *Financing for life-cycle costs* aspect, due to its inability to keep up with operations and maintenance costs, which also adversely impacts the *quality of service* dimension.

***Policy, legislation, and institutions- Score 61/100***

The vast majority of LIC users (84%) stated that they were aware of the level of services they should be receiving from the CBO. However, this was expressed in non-technical terms such as "good quality", "clean" or "always available" water service - this is to be expected since the CBO does not have an official charter for LIC residents promising a certain specification of water quality, which limited service professionalization. CBOs, on the other hand, seemed clear on their roles and responsibilities. However, 34% of the respondents believed that the CBO was either not qualified f or their role or did not have the proficiency needed for performing certain tasks.

Before starting the project, 14% of the respondents indicated that they were not consulted in decision making of the location and/or type of water point.

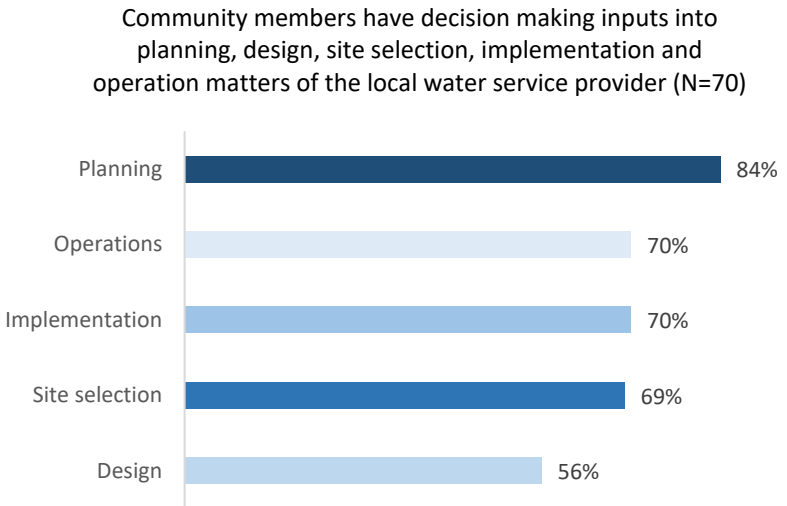



*Figure 50 NC Water-ATM Community Input in Decision Making*

As most residents in the LIC are Hindus, according to beneficiaries interviewed, before setting up water ATMs, everyone of this locality has been called to the temple and the members of the CBO

committee took their opinion. According to the survey, 66% of the respondents mentioned that the CBO and service provider was highly proficient while 9% believed that the CBO was not qualified for their roles.

***Financing for life-cycle costs- Score 23.8/100***

According to the CBO interview, there is no O&M fund being maintained. The model is at such a precarious financial stage that the CBO has to cover for operating expenses using their personal fund. On the other hand, beneficiary IDIs would seem to suggest that consumers are not aware that their payments are partially covering O&M cost, as the CBO mentioned.

According to the LIC residents' survey, 83% of the respondents expressed that there is a complaint mechanism in place. Among these, 46% mentioned that the mechanism is effective in dealing with all/most issues. Lastly, the CBO mentioned that they are unable to raise money for operating expenses by selling water from the ATM. They are also incapable of paying money to the operator of the ATM.

***Planning- Score 35/100***

According to the CBO, all the family representatives were consulted prior to taking any decision regarding the project. According to the beneficiaries interviewed, everyone gave their opinion and the consultation process was inclusive. Despite, the model being a water ATM, only 54% of the users use it for drinking purposes.

According to the LIC residents' survey, 87% of the respondents mentioned that they use other water sources. According to all 3 beneficiaries interviewed, they all used other alternative water lines. According to the LIC residents' survey, 91% of the respondents stated that the water point can be safely accessed and used by all user groups.

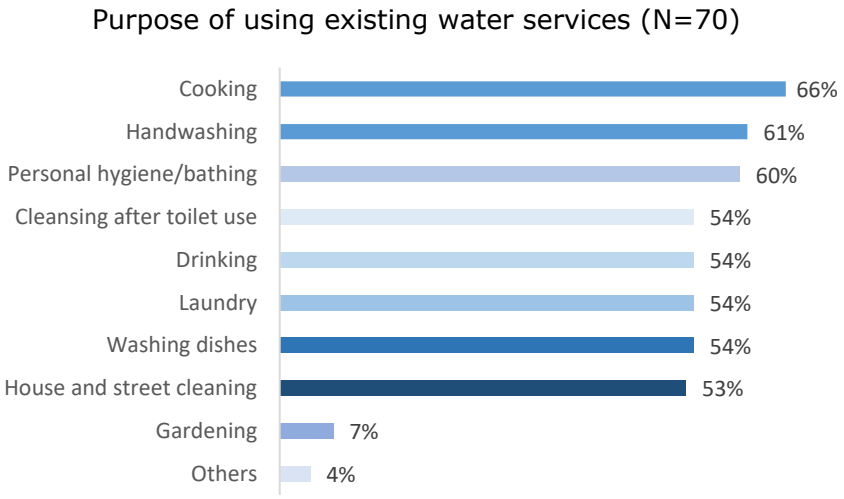



*Figure 51 NC Water-ATM Purpose of using existing water services*

***Transparency and accountability- Score 38.3/100***

According to the LIC residents' survey, 83% of the respondents expressed that there is a complaint mechanism in place. According to the beneficiaries interviewed; they usually complain to CBO members verbally. One out of three beneficiaries interviewed stated that they believe CBO and DWASA are not accountable. Furthermore, according to all beneficiaries interviewed, the CBO does not tell residents anything about the quality of their work or disclose any financial information. Among surveyed respondents, 46% mentioned that the mechanism is effective in dealing with all or most issues faced.

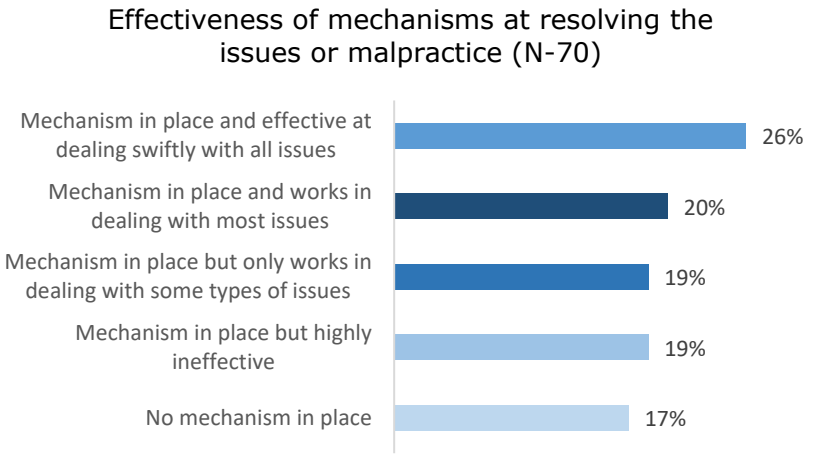



*Figure 52 NC Water-ATM Effectiveness of Complaint Mechanism*

***Capacity- Score 22.5/100***

It is understood that, according to the beneficiaries interviewed, community level promotion and training sessions are not common among residents. According to the CBO, DSK or Plan International has not conducted any training or awareness raising session as a part of this project in the area recently. However, from a non-WASH perspective, Plan International has been actively working in providing for the underprivileged children in the LIC.

***Learning and knowledge management- Score 10/100***

The CBO-led Robidashpara Water ATM was established as part of a project led by Plan International, with SAJIDA Foundation as the implementing partner. SAJIDA Foundation had helped in securing the necessary permissions for setting up the Water ATM and in the selection of a contractor but DSK later became involved in the software services of that particular CBO. Furthermore, Plan International no longer has a functional counterpart for the completed project, and the Water ATM has largely fallen into neglect. Due to the involvement of multiple parties, the Robisdashpara Water ATM does not have a unified front for advocacy on its behalf and also lacks comparable deployments elsewhere of the same model to draw lessons from. As a completed project, events specific to this model designed to share its experiences are not held and the institutional knowledge largely lost.

***Harmonization and alignment- Score 17.5/100***

Through interviews with DWASA, it was uncovered that DWASA is completely unaware of the CBO-led water ATM model in Robidashpara. Hence, the model scores very low from the alignment and harmonization perspective. Due to inactivity of the model's main sponsor - Plan International - in the WASH for LIC space in Dhaka city, there are no plans to replicate the model elsewhere in Dhaka. Despite its implementing NGO, SAJIDA Foundation, being a part of the core group of NGOs supporting the DWASA CPCR Unit, the model is not championed by them. The non-existent advocacy front of the ATM-NC model and the lack of a clear champion to lead the model means that the model is unlikely to be a candidate for replication by other WASH LIC project sponsors.

***Environment- Score 75/100***

According to the beneficiaries interviewed, they are not aware of any environmental or social impact done prior to the line being set up. However, interviews with SAJIDA Foundation suggested that it is common practice for them to conduct a social and environmental impact assessment before starting a new project. This assessment, however, is done informally/verbally and any identified issues solved through discussion in the consultation meeting with the CBO and community members.

***Quality of service- Score 33.8/100***

According to the LIC residents' survey, 70% of the respondents mentioned that the quantity of water supply from the LIC system is sufficient. Furthermore, 64% of the respondents stated that the water provided in the LIC is available throughout the day (24/7). While others mentioned that service interruptions are faced anytime of the day and also mostly during noon. Additionally, 29% of the respondents said they do not face any service downtime at all, a large majority (55%) said they face service downtime less than once or once or twice a month.

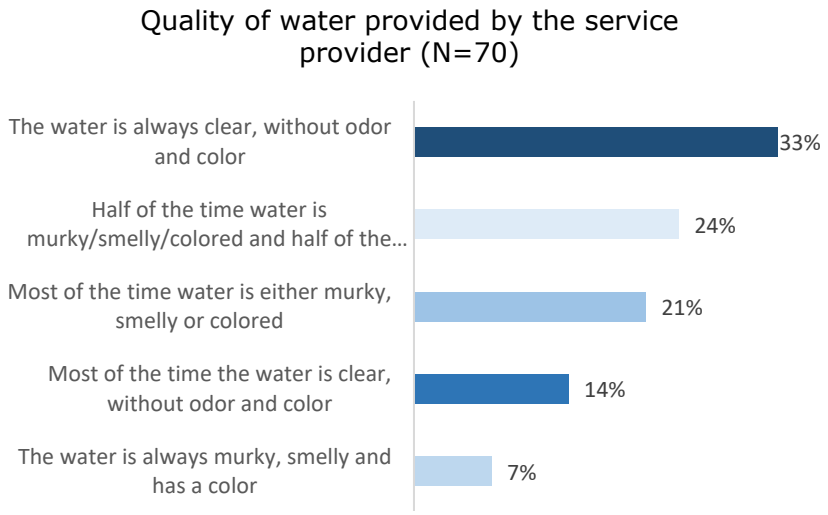



*Figure 53 NC Water-ATM Water Quality*

40% of respondents expressed that the repairs are generally completed within 24 hours. However, according to one interviewed resident, the ATM has been damaged about 3/4 times since the ATM was set up and it took about one day to fix it. In an extraordinary case, there was another time when water was not available for a month from the ATM.

According to beneficiaries, there are no separate facilities for the elderly or the disabled but with the help of others it is possible to use the water line. Furthermore, according to the survey, 9% of respondents mentioned that they cannot afford to pay for the water tariff at all.

### *3.8.3. Prevailing Issues and Risk Assessment*

The ATM-NC model faces several major threats. First of all, the operators of the model are unable to keep up with operations and maintenance costs from user collections, which also adversely impacts the *quality of service* dimension by limiting the hours of operation for such an essential service. At the same time, constantly rising water tariffs are likely to put even more pressure on CBOs to continue operation of the service. Thirdly, the technology aspect of the model means CBOs cannot independently run the operations and depend on a large extent on external vendors for continued operations, which once again calls into question the long-term sustainability of the model – particularly if major repairs are required in the future. Without any other prominent examples of the ATM-NC model, the Robidashpara Water ATM faces an uncertain future about how it will be able to mitigate or minimize the multiple threats to its existence.

The following table identifies the main risks that were identified for the Non-Commercial Water ATM model, as it relates to the Robidashpara LIC site:

*Table 25 NC Water-ATM Model Risk Assessment*

| Sl. | Description of Risk | Remarks on Prevailing Situation | Risk Category | Probability | Impact | Score |
|---|---|---|---|---|---|---|
| 1 | Users who are not satisfied with the water quality, daily downtimes and rising tariffs may be compelled to shift illegal lines | Water quality is not considered a major issue since water is purified. However, operation of the Water ATM with necessary components is in threat due to inability to meet costs | Political Risk | 2 | 2 | 4 |
| 2 | Threat of resident eviction from LICs | Not a probable threat at present | Political Risk | 1 | 3 | 3 |
| 3 | Risk of service bottlenecks due to unforeseen capital expenses and capacity increases | Daily downtimes due to inability to meet O&M expenditures has alredy led to massive attrition as people use alternative CBO and illegal water sources for drinking | Investment Risk | 3 | 3 | 9 |
| 4 | Discontinuation of BCC programs lead to decline in customer demand | Awareness programs are regularly held and considered effective | Operational Risk | 1 | 1 | 1 |
| 5 | Insufficient capacity (daily downtimes) persists leading to customer attrition | Daily downtimes due to inability to meet O&M expenditures has alredy led to massive attrition as people use alternative CBO and illegal water sources for drinking | Operational Risk | 3 | 3 | 9 |
| 6 | DWASA is unresponsive to complaints regarding water quality/ contamination | DWASA has not been able to fully resolve complaints regarding poor water quality | Operational Risk | 3 | 2 | 6 |
| 7 | Skills and performance of CBO declines as external partners phase out training and capacity building programs | CBO does not have the necessary risk and has to rely on external expertise of an operator | Operational Risk | 3 | 3 | 9 |
| 8 | Annual tariff increases by DWASA persists and makes tariff unaffordable to LIC residents, resulting in CBO unable to meet tariffs payments | Tariffs have been rising annually for the past 3 years, and is expected to have a proportional effect in price increae at the Water ATM, meaning even less people will be able to afford the water. But DWASA tariff represents only ~10% of costs so impact is lower. | Tariff Risk | 3 | 2 | 6 |
| 9 | Ageing infrastructure requires high maintenance and capital replenishment costs, which cannot be met with | So far maintenance costs have been sourced from users, but due to small number of users and reduced community interest, the | Financial Risk | 3 | 3 | 9 |

| Sl. | Description of Risk | Remarks on Prevailing Situation | Risk Category | Probability | Impact | Score |
|---|---|---|---|---|---|---|
| | contributions from LIC residents | future of the service is at threat | | | | |
| 10 | The CBO signatory may relocate or otherwise by unable to perform his/her duties without a formal transfer of power, leaving the CBO unable to access retained funds from the CBO bank account. | NGOs such as DSK are working to update CBO model with contingencies in case the signatory becomes unavailable | Financial Risk | 1 | 2 | 2 |
| 11 | Daily water wastage when clearing out dirty/ contaminated water from the LIC network system. | Not applicable | Environmental Risks | | | |
| 12 | Donor funding comes to an end and impedes operational and/or capital expenditures | CBO models is designed to operate independently of donors but so far limited collection from users put the operation of the Water ATM at risk | Financial Risk | 3 | 3 | 9 |
| 13 | DWASA funding comes to an end and impedes operational and/or capital expenditures | Not applicable as DWASA does not cover any O&M costs for this model | Financial Risk | | | |
| 14 | Local political opposition impedes service provision in the LIC/locality | Community opposition was not identified as a threat | Political Risk | 1 | 1 | 1 |
| 15 | DWASA settles on single modality for water service provision to LICs | The CBO-managed Water ATM has low visibility overall and weak on advocacy | Regulatory Risk | 3 | 2 | 6 |

## 3.9. Commercial Water ATM Model: Kadamtala

### 3.9.1. General observations:

The Kadamtala Water ATM is situated near Bashabo/Mugda area under Dhaka South City Corporation. Drinkwell has 190 water ATMs inside Dhaka city, of which 170 are operational. However, this location was selected by Drinkwell specifically as it was located nearby to LICs and was thought to cater to more LIC populations than other Drinkwell ATM locations.

*Figure 54 C Water ATM Model: Kadamtala Water ATM*

Considering this model is a commercial water ATM model, the respondents of the survey belonged to multiple income groups and were not necessarily representatives of LIC residents. Furthermore, the list of questions was shortened for adapting with the attention span of the customers of the ATM. The total number of customers surveyed were 73. About half (52%) of which were female while the other 48% were male clients. Only 27% of the 73 ATM-C users surveyed reported that they lived in an LIC area.

Drinkwell first started its operation with DWASA from 2017. They began their journey with 10 plants in 2017 in 10 different locations allocating their own operators from Drinkwell. Later on, they established 86 plants (at the end of 2018) under a single phase and they required a lot of operators, for which they looked for external vendors. Then, through a selection process they selected their vendors who provided the operator service. By 2020, they had plans to expand to 300 locations in Dhaka city from the existing 200, but this plan was disrupted due to the Covid-19 pandemic. Hence, the plan is to complete this expansion by 2021. The ATM booths operate in either one shift of 8 hours or double shift of 16 hours, depending on the demand in a particular locality.

Drinkwell manages the technology O&M and operator on-boarding aspects of the ATM-C model, while DWASA finances the operator salaries and boot operation (e.g. electricity) costs. Staff costs for Drinkwell, including administrative and technical staff salaries, are met through external donor contributions. For Drinkwell this is a completely non-profit initiative, as Drinkwell is not allowed to receive any share of revenue from the booths. Although a non-profit initiative from the perspective of Drinkwell, the service is formally managed under ownership of DWASA, which aims to become a profitable utility service provider for Dhaka city in the long-term. Hence this model is termed as a commercial ATM model.

**Note:** Although the ATM-C model is meant for use by low-income households, it is not exclusively meant for use by LIC residents and its booths are not located within any LICs. Hence, the performance evaluation indicators used for assessment in this study were, in many cases, not directly applicable to the ATM-C model, since the evaluation criteria were

biased towards performance in an LIC-based context. Readers should be aware that ATM-C model was included with the specific understanding that its performance would not be held to the same standards as the other LIC-based water service delivery models evaluated under this study.

### 3.9.2. Dimensions of the Assessment system

The ATM-C model scores highly in the *Policy, legislation and institutions* dimension by virtue of being one of the clearly preferred models for penetrating LICs using DWASA services. This is clearly evident in the co-financing arrangement that DWASA has in place with the technology provider, Drinkwell. By virtue of the DWASA contribution and an anticipated stable cashflow from donors, the model also scores highly in *Financing for life-cycle costs* dimension.

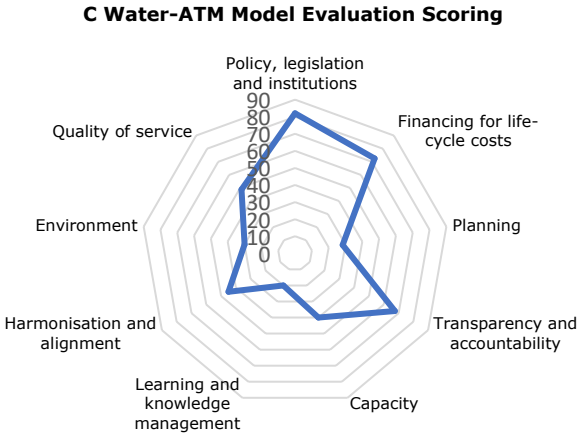



*Figure 55 C Water-ATM Model Scoring*

However, the model scores weakly in the *environment* category, as it does not attempt to take into account social and environmental factors explicitly prior to setting up. In a similar vein, due to its limited interaction with LIC community members regarding planning and decision-making factors, the model scores lowly in the *Planning* dimension. The poor performance across these two dimensions can be attributed to the uniqueness of the operational model – the ATM booths are located outside of LICs.

The ATM-C model also scores low in the *Learning and Knowledge Management* dimension, being the only example of ATM-C model identified in operation in Dhaka city and thus having a smaller knowledge base to derive lessons from and limiting the scope to combine efforts from multiple driving organizations into a collective advocacy process.

***Policy, legislation, and institutions- Score 82/100***

According to the user surveys, 81% of the respondents believed that the local service provider is highly proficient. Drinkwell outsources its operations of booths to three different sub-contractors to cover its 170 locations. Drinkwell also has an agreement signed and effective with DWASA for operating these ATMs, under which DWASA finances the operator salaries and boot operation (e.g. electricity) costs. Through this agreement and frequent interactions between Drinkwell and DWASA, the roles and responsibilities of DWASA and Drinkwell are clearly identified for each party.

***Financing for life-cycle costs- Score 73/100***

DWASA provides funding for the operation and maintenance of the ATM booth infrastructure along with covering the costs associated with repairing water and electricity lines. They also provide a certain amount to each booth for the human operator expenses (outsourced to external vendors). Furthermore, the technology and its maintenance are funded by Drinkwell through their donors. They also have administrative departments, monitoring departments - the costs of which are entirely funded by donors. Due to their strong reporting arrangements with DWASA and presence of dedicated administrative staff, costs are tracked regularly and forecasts generally represent future performance.

Some Water ATMs are highly popular and according to the CEO of Drinkwell, since 2017 DWASA has received more revenues from ATM card sales and card recharge sales on a cumulative basis than it has paid out in booth operation costs. However, as a whole taking into account the performance of all 190 ATM booths (of which 170 are operational) into account, the entirety of O&M costs - encompassing booth operation costs plus overhead expenses (technician salaries, monitoring staff salaries etc.) - are not being covered from revenues received from users. In fact, taking into consideration CAPEX costs such as depreciation, the ATM booth operations have not generated any profits from DWASA and under the present agreement. Drinkwell anticipates all operational, maintenance and overhead costs to be covered through user contributions once the model is scaled up to 300 sites. However, it is unlikely that depreciation costs will be recovered at that point. Drinkwell is not allowed to receive any share of revenue from the booths, nor are there provisions in the agreement for them to do so in the future.

***Planning- Score 28/100***

The planning process is a mostly top-down approach. Consumer participation in the planning process is limited to mostly demand assessment. Out of 500+ water pump locations across Dhaka city, DWASA and Drinkwell have pinpointed 300 locations for setting up ATM booths and does not intend to go beyond this number. The sites were assessed by a market research firm which conducted surveys in the vicinity of potential sites, covering both LIC and non-LIC locations, in order to select those zones which were thought to have sufficient demand for an ATM. If demand is established, Drinkwell set up a booth there once a formal request is issued from DWASA. DWASA issues the request after analyzing how the users of the area will be benefited from the ATM.

After a booth has been commissioned, locals are no longer consulted in decision-making or demand assessment purposes. The initial demand assessment process did not factor in uses of water for purposes other than drinking and according to the survey of users, all of the respondents use other water from alternative sources for other purposes.

***Transparency and accountability- Score 67.5/100***

The ATM booths are strictly monitored by Drinkwell and a monthly report on usage and performance is submitted to DWASA. According to Drinkwell, all the money collected from the booths are sent to DWASA, which maintains separate bank accounts for water sales and card recharges. DWASA also have a complaint mechanism for the consumers in place utilizing the DWASA's central 16162 WASH hotline. The hotline number is prominently exhibited in the booth and consumers can call the hotline and place their complaints. There are visual cues within the booths showing step-by-step illustration of how to use the Water ATM – as a result user are aware of the level of service to expect.

***Capacity- Score 40/100***

Drinkwell provides training and capacity building to its operators. Drinkwell also trains DWASA on a very limited basis on capacity building regarding their usage models. DWASA, however, is not involved in training delivery as it does not have any provision to conduct training of either Drinkwell or the ATM booth operators and neither does it receive training from the central or local government regarding Water ATM booth management.

***Learning and knowledge management- Score 20/100***

Drinkwell does not fall under the CPCR unit of DWASA which is mainly designed for serving the LICs of Dhaka. No knowledge sharing workshops are known to be conducted with other LIC-based NGOs and wider LIC-focused WASH stakeholders, as was seen in the case of NGOs who followed CBO-led models to deliver water services to LICs under CPCR Unit partnership. Although the Drinkwell model is advocated among multiple donor agencies

and financiers, it is framed as an innovative technology/ operational model and not primarily as a model designated for LIC users.

***Harmonization and alignment- Score 45/100***

Drinkwell's ATM-C model is isolated from other CBO led models and SE models as it is not included under the CPCR unit of DWASA. The ATM-C model is however is supported by its dedicated sub-committee from DWASA. With a commitment from DWASA to fund the operation of the ATM booths, the model does have a solid footing in terms of alignment with DWASA for reaching LIC residents with a pro-poor focus. However, the relatively low proportion of usage (27%) by LIC users may raise questions regarding the target market for this model. Frequent coordination meetings by Drinkwell with their donors and DWASA ensures a strong relationship is maintained with stakeholders.

***Environment- Score 30/100***

For the ATM-C model of Drinkwell, only a market survey is conducted prior setting up a booth to ascertain whether there is any demand for potable drinking water at the offered prices in the vicinity of a given DWASA water pump location, which is a weak substitute for a social impact assessment. No formal environmental or social impact assessment is performed as it is deemed unnecessary, since the booths are set up within the enclosed premised of DWASA.

***Quality of service- Score 48.8/100***

According to the survey, 62% of the respondents mentioned that the water is always/mostly clear, without odor and color. The other 38% stated that the water is murky/smelly/colored half of the time. Furthermore, it is available throughout the day 24/7 according to the respondents.

While 58% of the respondents mentioned that they do not face any service interruptions at all, 36% stated that it could be at any time of the day. This would suggest that the booth can often be out of order or not in service. Additionally, 59% of the respondents stated that they face service downtime either less than one day per month or once/twice a month. Subsequently, 75% of the respondents mentioned that the repairs are generally completed within 24 hours. Drinkwell, too, suggested that most repairs are solved within 24 hours. However, some repairs do require more time as they need approval or submit paperwork.

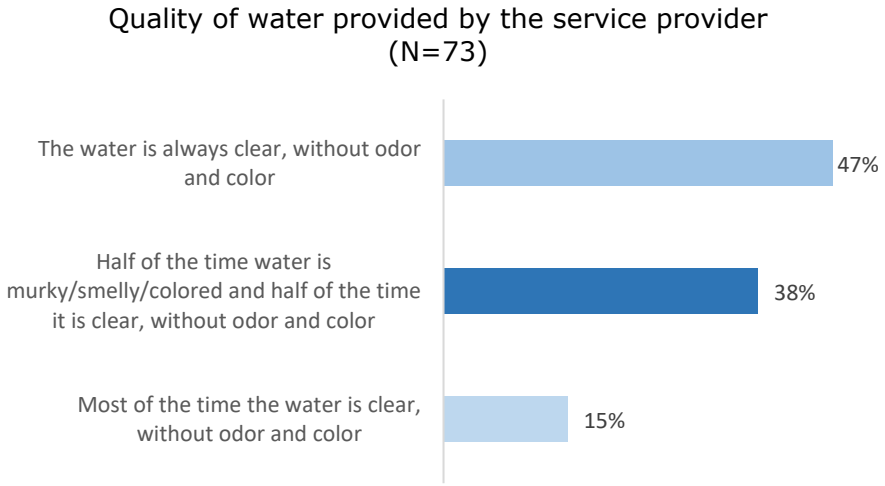



*Figure 56 C Water-ATM Water Quality*

The ATM can be safely accessed by both men and women throughout the day according to 100% of the respondents. Furthermore, 100% of the respondents stated that they can afford to pay for the water every month. Lastly, Drinkwell have set rules to not sell the water for commercial or business purposes. Each person is limited to withdrawing 2-4 jars

of water per day, which is enforced by the on-site manual operator to ensure adequate sufficiency. So that, the LIC users can have the opportunity to avail their water services.

### 3.9.3. Prevailing Issues and Risk Assessment

The main threat to the ATM-C model is its dependence on external donors for support. Although DWASA contributions help to cover booth operational costs and are secure for the short to mid-term, the model still relies on external donor support for repairs and technical operations and maintenance, as well as all administrative salaries (including support services such as accounting and M&E). Complete transfer of fiscal responsibilities is possible but it is not clear whether DWASA is willing or able to take on such obligations, while a full transition to a commercially sustainable model will likely necessitate an upward revision or prices, which can put the pro-poor objectives of the model in jeopardy.

The following table identifies the main risks that were identified for the Non-Commercial Water ATM model, as it relates to the Kadamtala ATM site:

*Table 26 C Water-ATM Model Risk Assessment*

| Sl. | Description of Risk | Remarks on Prevailing Situation | Risk Category | Probability | Impact | Score |
|---|---|---|---|---|---|---|
| 1 | Users who are not satisfied with the water quality, daily downtimes and rising tariffs may be compelled to shift illegal lines | Not Applicable | Political Risk | | | |
| 2 | Threat of resident eviction from LICs | Not Applicable | Political Risk | | | |
| 3 | Risk of service bottlenecks due to unforeseen capital expenses and capacity increases | While service bottlenecks may arise, donor funding may be accessed to rectify the issues | Investment Risk | 1 | 2 | 2 |
| 4 | Discontinuation of BCC programs lead to decline in customer demand | Not Applicable | Operational Risk | | | |
| 5 | Insufficient capacity (daily downtimes) persists leading to customer attrition | Proximity to pump ensures water availability but booth is not open at all times. | Operational Risk | 2 | 3 | 6 |
| 6 | DWASA is unresponsive to complaints regarding water quality/ contamination | DWASA is mostly responsive to issues however water quality is not to full satisfaction of users. | Operational Risk | 1 | 2 | 2 |
| 7 | Skills and performance of operators declines as external partners phase out training and capacity building programs | Operators at present receive training from Drinkwell during onboarding but regular training structure is missing. | Operational Risk | 2 | 2 | 4 |
| 8 | Annual tariff increases by DWASA persists and makes tariff unaffordable to LIC residents, resulting in operator unable to meet tariffs payments | Tariffs have been rising annually for the past 3 years, but thus far have not affected pricing at Water ATM. | Tariff Risk | 3 | 1 | 3 |

| Sl. | Description of Risk | Remarks on Prevailing Situation | Risk Category | Probability | Impact | Score |
|---|---|---|---|---|---|---|
| 9 | ATM Booth infrastructure demands high maintenance and capital replenishment costs, which cannot be met with contributions from users | O&M costs are presently sourced from DWASA and partially from donors by Drinkwell. User tariffs are not enough to cover O&M costs | Financial Risk | 2 | 3 | 6 |
| 10 | The CBO signatory may relocate or otherwise by unable to perform his/her duties without a formal transfer of power, leaving the CBO unable to access retained funds from the CBO bank account. | Not Applicable | Financial Risk | | | |
| 11 | Daily water wastage when clearing out dirty/ contaminated water from the LIC network system. | Not Applicable | Environmental Risks | | | |
| 12 | Donor funding comes to an end and impedes operational and/or capital expenditures | Drinkwell's field force and supporting departments depend on donor funding to function, which has been stable so far | Financial Risk | 2 | 3 | 6 |
| 13 | DWASA funding comes to an end and impedes operational and/or capital expenditures | DWASA is covering most O&M costs at present | Financial Risk | 1 | 3 | 3 |
| 14 | Local political opposition impedes service provision in the LIC/locality | Some local protest is faced by DWASA pump due to interruptions, some of which may threaten the ATM booth | Political Risk | 1 | 2 | 2 |
| 15 | DWASA settles on single modality for water service provision to LICs | Not a threat as CBO models and commercial Water ATM models are the formally approved approaches | Regulatory Risk | 1 | 2 | 2 |

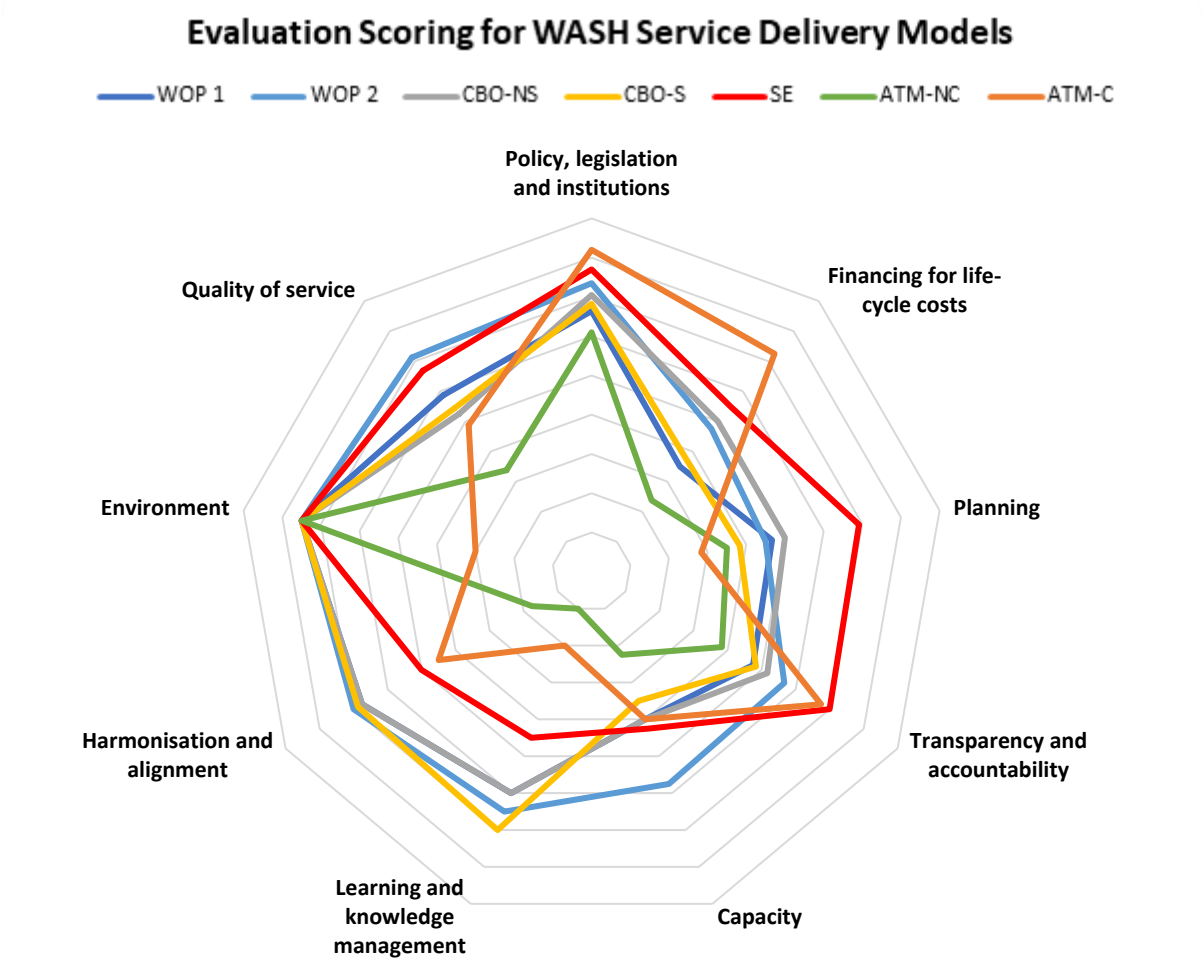
# Chapter 4. Summary of Evaluation Findings

This chapter of the report summarizes the evaluation findings as they relate to different models, allowing for cross-comparison of model performance across the dimensions of the modified IRC framework as well as various identified risk parameters.

## 4.1. Summary of framework evaluation findings across models

As shown in Figure 46, there is a significant disparity in the performance of the various models across each of the nine framework dimensions, signaling a potential for the models to improve performance by learning from each other. Also, no model outperforms all other models on all nine dimensions. Likewise, there is no obvious underperformer, although the ATM-NC model is the lowest performing model in all but one dimension. Within models themselves, there is a vast difference in performance along the different dimensions, particularly for the ATM-C and ATM-NC models. Interestingly, all the CBO-led models (including WOP 1 and WOP2) tend to cluster closer along certain dimensions such as *Policy, legislation and institutions*, *Learning and knowledge management* and *Harmonization and alignment*, highlighting the alignment and similarities between their CBO-led approaches.

*Figure 57 Evaluation Scoring for WASH Service Delivery Models*



| SL | Dimension | WOP 1 | WOP 2 | CBO-NS | CBO-S | SE | ATM-NC | ATM-C |
|---|---|---|---|---|---|---|---|---|
| 1 | **Policy, legislation and institutions** | 66 | 74 | 71 | 68 | 77 | 61 | 82 |
| 2 | **Financing for life-cycle costs** | 35 | 48 | 50 | 38 | 55 | 24 | 73 |
| 3 | **Planning** | 47 | 45 | 50 | 38 | 69 | 35 | 28 |
| 4 | **Transparency and accountability** | 48 | 57 | 52 | 48 | 70 | 38 | 68 |
| 5 | **Capacity** | 40 | 58 | 40 | 35 | 43 | 23 | 40 |
| 6 | **Learning and knowledge management** | 60 | 65 | 60 | 70 | 45 | 10 | 20 |
| 7 | **Harmonisation and alignment** | 68 | 70 | 68 | 69 | 50 | 18 | 45 |
| 8 | **Environment** | 75 | 75 | 75 | 75 | 75 | 75 | 30 |
| 9 | **Quality of service** | 59 | 71 | 53 | 54 | 67 | 34 | 49 |
| | **Average Across All Dimensions** | **55** | **62** | **57** | **55** | **61** | **35** | **48** |

** Color shades indicate relative performance across each dimension. A green shade indicates scores of 70 and above, yellow shade indicates scores between 30 and 70, and red shades indicate scores of 30 or lower.*

It should be noted when interpreting the findings of this chapter and when comparing the performance of different models that, while LCP has made every effort to remain unbiased, the scores are subjective and based on the perspectives of the authors who depended on the information gleaned during the course of this study. A different team of consultants may naturally have come to a different set of scores for the models outlined.

Furthermore, when inferring conclusions from the findings, some additional site or context-specific considerations should be kept in mind such as:

- **The ATM-C Model:** Although the ATM-C model is meant for use by low-income households, it is not exclusively meant for use by LIC residents and its booths are not located within any LICs. Hence, the performance evaluation indicators used for assessment in this study were, in many cases, not directly applicable to the ATM-C model, since the evaluation criteria were biased towards performance in an LIC-based context. Readers should be aware that ATM-C model was included with the specific understanding that its performance would not be held to the same standards as the other LIC-based water service delivery models evaluated under this study.

- **Active vs. Completed projects:** Projects which are ongoing with completed portions already operational (such as the Zamindar Bari, City Polli and the two commercial models) have performed considerably better in this evaluation as opposed to completed projects (such as Hazi Sobhan Road, Satellite and Robidashpara LICs). This is because these ongoing projects have a considerably higher financial resource base, capacity building resources and technical assistance from external stakeholders, which diminish to a large extent post-project completion. Hence, scores are expected to decrease in the post-completion phase.

- **Ownership of Robidashpara Water ATM:** The CBO-led Robidashpara Water ATM was established as part of a project led by Plan International, with SAJIDA Foundation as the implementing partner. SAJIDA Foundation had helped in securing the necessary permissions for setting up the Water ATM and in the selection of a contractor but DSK later became involved in the software services of that particular CBO. Furthermore, Plan International no longer has a functional counterpart for the

completed project, and the Water ATM has largely fallen into neglect. There are no plans to replicate the model elsewhere in Dhaka and as a consequence of the involvement of so many parties, the Robisdashpara Water ATM does not have a unified front for advocacy on its behalf. Contextual factors, therefore, are thought to have played a key role in the underperformance of the Water ATM model.

- **Respondent composition for Bhashantek Social Enterprise model:** Due to the risks of opposition from political groups in conducting large-sale surveys, unlike other models, interviews were conducted with a much smaller sample in Bhashantek LIC which composed mostly of Shobar Jonno Pani staff who were also users of the service. Hence, the findings from that site/model should be read in context of this limitation with a caveat that there may be certain biases on the part of respondents, and the evaluation outcomes of that model may have been different if administered randomly among users as was done in other LIC sites.

The sub-sections that follow compare, contrast and elaborate on the main performance factors of the studied WASH models across each of the dimensions:

### 4.1.1. Policy, legislation and institutions

*Table 27 Policy, legislation and institutions across all models*

| Indicators | WOP 1 | WOP 2 | CBO-NS | CBO-S | SE | ATM-NC | ATM-C |
|---|---|---|---|---|---|---|---|
| **1. Policy, legislation and institutions** | **66.4** | **73.5** | **70.5** | **68.3** | **77.0** | **61.0** | **82.0** |
| **1.1.** Sector policies and stakeholder mandates | 65.0 | 70.0 | 62.5 | 62.5 | 80.0 | 75.0 | 90.0 |
| **1.2.** Service delivery models | 65.0 | 70.0 | 75.0 | 70.0 | 90.0 | 75.0 | 85.0 |
| **1.3.** Professionalisation of community management | 75.0 | 82.5 | 75.0 | 73.8 | 85.0 | 60.0 | 85.0 |
| **1.4.** Regulation of service providers | 72.0 | 80.0 | 75.0 | 72.5 | 65.0 | 40.0 | 80.0 |
| **1.5.** Technology | 55.0 | 65.0 | 65.0 | 62.5 | 65.0 | 55.0 | 70.0 |

Among the seven models, the ATM-C model performs the best, followed by the SE and WOP2 models. The higher scores of the ATM-C and SE models could be attributed to the clear delineation of responsibilities, which also clarifies expectations among users and stakeholders. By contrast, users of CBO-led models are not always aware of what level of service to expect and the multiple technology variations of the CBO-led models can make it difficult for users to make distinctions.

There is an agreed array of water services delivery models for use in LICs across Dhaka whereby the precise allocation roles and responsibilities to the different stakeholders are different between one model and the next. Site-specific factors and the partner organizations involved have also proven to be factors in determining to what extent beneficiaries are made aware of the service levels to be expected.

Consultations have identified a clear preference for the CBO model, which is officially recognized by DWASA for replication across LIC areas through the CPCR unit. Service delivery models for the CBO-led efforts are much more clearly defined by virtue of being well-tested model that has been replicated by multiple stakeholders. At the same time, DWASA acknowledges that there should not be a one-size-fits-all approach for reaching LIC users, as evidenced by the variety of models in play and prior to operationalization of the CPCR unit, they had not been actively involved in vetting particular LIC models over others effectively allowing several different models to co-exist. While the management of LIC water services by private parties relating to the SE model is permitted in one site of Dhaka through a special MoU, this suggests an opportunistic approach rather than one of focus and control. The SE model it has less of a policy permanence compared to the CBO-based models and given that the permission was granted several years ago, it uncertain whether DWASA will grant new permissions for replicating the SE model in other sites. The ATM-C model does not fall under the purview of the CPCR Unit of DWASA and instead is directed by a sub-committee within DWASA. The ATM-C model also benefits by being one of the most solidly supported models from DWASA for future expansion.

In terms of professionalization of community management, the commercial models and the ongoing CBO-led projects have proven to be much more effective in ensuring service quality to customers. The commercial models have an advantage in this regard as they are better equipped and have their own team of technicians to deal with issues. However, the CBO models fared better in allowing customers to choose the technology, unlike the commercial models. However, even for the CBO models, DWASA does not have any guidance regarding the choice of technology to be used at water points.

### 4.1.2. Financing for life-cycle costs

*Table 28 Financing for life-cycle costs across all models*

| Indicators | WOP 1 | WOP 2 | CBO-NS | CBO-S | SE | ATM-NC | ATM-C |
|---|---|---|---|---|---|---|---|
| **2. Financing for life-cycle costs** | **35.0** | **47.5** | **50.0** | **37.5** | **55.0** | **23.8** | **72.5** |
| **2.1.** Financial planning to cover all life-cycle costs | 35.0 | 40.0 | 45.0 | 37.5 | 50.0 | 20.0 | 85.0 |
| **2.2.** Asset management | 35.0 | 55.0 | 55.0 | 37.5 | 60.0 | 27.5 | 60.0 |

The ATM-C and SE models achieve the highest scores in this dimension. Financial planning is yet to become sustainable for any single model. The CBO model (with the exception of the ATM-NC model) is somewhat more sustainable compared to the commercial models, which for the most part are not able to break even with their operational costs and are able to source emergency financial needs from community members on an urgent basis. Commercial models, with their dependence on external donors are highly susceptible to multi-party risk, i.e. if contributions from one donor ceases it may cause the whole operational model to collapse. On the other hand, the financial resilience of the CBO model can also be attributed to the minimal level of service provided under that model.

There are no central guidelines or standards to estimate LIC system costs, and different actors adhering to different models have developed their own standards, if at all. Most notably, the various CBO models explored did not have any proactive means for cost projections and also suffer from arbitrary cost allocations in times of urgent expenses. It is commonplace for CBOs from completed projects to reach out to NGOs and external donors for support.

The size of the asset management fund at CBOs was found to depend largely on the site, the capacity of the CBO members and the financing organization/donor involved. Sustainability is a major weakness of the CBO model, in cases where the signatory is not available (whether they have passed away or moved away from the LIC or for other reasons) for accessing the capital funds for rehabilitation/repair purposes.

The major weakness of the commercial models lies in their inability to recuperate operational and maintenance costs, let alone capital expenditures. Drinkwell anticipates all operational, maintenance and overhead costs to be covered through user contributions once the model is scaled up to 300 sites. However, it is unlikely that depreciation costs will be recovered at that point. The ATM-C model also fares comparatively better than the SE model due to having committed funding from the DWASA for running the ATM booths, while donor inputs are expected to continue indefinitely (according to both Water and Life and SJP) to cover additional costs such as administrative staffing, technical teams and setup and installation costs for line expansion. Commercial models generally have a more structured way of tracking costs, leading to the availability of reasonable estimates of forecasted costs and they also tend to have a more robust way of allocating costs to their financiers and partner organizations.

### 4.1.3. Planning

*Table 29 Planning across all models*

| Indicators | WOP 1 | WOP 2 | CBO-NS | CBO-S | SE | ATM-NC | ATM-C |
|---|---|---|---|---|---|---|---|
| **3. Planning** | **46.7** | **45.0** | **50.0** | **38.3** | **69.2** | **35.0** | **28.3** |
| **3.1.** Scaled up service provision | 45.0 | 50.0 | 45.0 | 47.5 | 40.0 | 20.0 | 45.0 |
| **3.2.** Inclusivity | 30.0 | 55.0 | 60.0 | 30.0 | 85.0 | 57.5 | 15.0 |
| **3.3.** Multiple water needs and sources | 65.0 | 30.0 | 45.0 | 37.5 | 82.5 | 27.5 | 25.0 |

Performance across the planning dimension was far from ideal for any single model. In this dimension, the SE model and the CBO-NS model score the highest, while the ATM-C, ATM-NC and CBO-S models score alarmingly low. At the moment, DWASA does not have specific policy and related investment plans to achieve full water supply coverage in the LIC areas under their jurisdiction. Nevertheless, LIC water service provision has been officially recognized as a mandate of DWASA and it is working on expanding the service to all LICs across Dhaka.

The role of monitoring is played mostly by the NGOs, social enterprises and commercial operators themselves, who report on a monthly basis to DWASA. However, it should be noted that ATM-C model, which was conceived as a solution for and officially recognized by DWASA as catering to the low-income population, is not officially considered to be under the purview of the CPCR/LIC Unit and hence the activities of Drinkwell DWASA booths are not accounted for in the monitoring of the CPCR unit.

In terms of inclusivity, the SE model and most of the CBO models perform comparatively better as they both involve project-mandated community inputs prior to site selection and during the design and construction phase. However, it can be argued that the process is not fully inclusive as landlords play the key role in decision-making processes, and decisions do not take into account opinions from all population groups, particularly the women, the elderly and the disabled. It should be noted here that most LIC population across Dhaka are not stable, with tenants moving from place to place due to changes in employment and lifestyle etc., which is why most CBO models rely on landowner representation in CBOs.

Although DWASA and partner organization have derived an estimate of the per capita water consumption in LICs (120 liters per capita according to an interview with the CPCR Unit), when planning for multiple water needs and sources, in most cases a rough benchmark of the number of water points to be shared by the number of households (typically 7-10 households per water point) is used. Taken together, this would translate to a guideline of between 3,700 and 5,300 liters of water per water point per day (assuming an average family size of 4.4 individuals as per CPCR records of all Dhaka LICs).

A key deficiency in the planning processes across various models is that they do not account for a future drop in water pressures and hence a drop in water quantity supplied, as has been seen in multiple sites across Dhaka city due to a fall in height of the underground water table – this has led to many CBO water points performing less or even becoming non-functional altogether.

For the Drinkwell WaterATM, initial surveys of community demand are done and used not only for go or no-go decisions but also to determine the operational hours for that particular ATM in order to meet the assessed needs sufficiently. Apart from this initial demand assessment, community members are not engaged with for any planning or operational activities under the ATM-C model.

### 4.1.4. Transparency and accountability

*Table 30 Transparency and accountability across all models*

| Indicators | WOP 1 | WOP 2 | CBO-NS | CBO-S | SE | ATM-NC | ATM-C |
|---|---|---|---|---|---|---|---|
| **4. Transparency and accountability** | **47.5** | **56.7** | **51.7** | **48.3** | **70.0** | **38.3** | **67.5** |
| **4.1.** Monitoring for services delivery | 57.5 | 65.0 | 60.0 | 62.5 | 75.0 | 15.0 | 85.0 |
| **4.2.** Accountability and civil society | 55.0 | 65.0 | 60.0 | 55.0 | 80.0 | 65.0 | 65.0 |
| **4.3.** Corruption | 30.0 | 40.0 | 35.0 | 27.5 | 55.0 | 35.0 | 52.5 |

In terms of transparency and accountability, the two commercial models – SE and ATM-C – are the clear frontrunners across each indicator. The CBO-led models perform weaker in comparison, with the ATM-NC model trailing all other models.

There are no written or recognized national or local standards or benchmarks for water services provision in LICs. However, the unwritten rule of thumb followed by DWASA is that an LIC must be within 1,000 ft (300 m) of an existing watermain to be eligible to receive new connection and 7-10 households at most should share a water point. DWASA does not regularly monitor the water quality within LICs unless complaints are received specific to a site and any such tests are not performed comprehensively. When they are conducted, they tend to only look primarily at the fecal coliform count for hygienic reliability. Ongoing CBO-led projects do have provisions to conduct their own testing through the use of third parties, which are usually conducted on a quarterly basis as long as project financing remains active.

Monitoring of CBO-led projects are done and aggregated by respective NGOs. The aggregate reports are submitted to DWASA. DWASA itself does not have a department or function for monitoring the quality of service provision to LICs. The monitoring parameters tracked by DWASA concern the number of water points and an estimate of households and beneficiaries served but this does not take into account the rate of penetration of water services within and across different LICs. The social enterprise model of SJP also adheres to this monitoring approach under the CPCR unit. The monitoring conducted by Drinkwell for the ATM-C model is done on the basis of the volume of water usage but the model scores low in the monitoring sub-indicator as the usage specific to LIC users has never been conducted in the past.

In terms of reporting and accountability, the service level, service providers and service providers of the various models are not monitored against benchmarks by DWASA and this function is instead performed to by the donors and NGOs, if at all. Although the CBO model provisions for service takeover and upkeep by CBOs after intervention from the NGOs is over, the service contracts between the CBO, implementing NGO and DWASA were not found to be effective in prompting corrective action by the CBOs. In addition, although the CBO models are ideally expected to provide full disclosure to the beneficiaries regarding service performance and financial performance, they do not and only a handful of CBOs in Dhaka - according to interviews with DSK, the largest local NGO involved in WASH services in LIC areas of Dhaka – are in a position to provide regular reporting to community members. Formal publications are not disseminated by any CBOs to their users or stakeholders. In contrast, both commercial models have reporting mechanisms, both for internal use and for reporting to their financiers/donors (in the case of SJP & Drinkwell) and DWASA (in the case of Drinkwell).

Regarding complaints management, for LIC dwellers the first point to register a complaint is the CBO members and more often than not, it is done informally/verbally. Some sites, such as Zamindar Bari of WOP2 offer the option for written complaints to be made to the CBO, as a consequence of which the model scores higher. In addition, the ATM-C and CBO models allow for complaints to be received through the DWASA hotline, which enforces an added layer of accountability. For the SE model, all complaints are directed to SJP, who then either deal with the problem if it is an issue with the LIC internal network or forward it to DWASA if it is an issues in the wider network.

In regards to the corruption sub-dimension, all CBO-led models have scored lower because their administrative processes including procurement are not open to scrutiny by other stakeholders but more importantly, they do not adhere to any set processes or procedures as a result of which administrative and procurement activities are performed arbitrarily an unstructured and undocumented manner. Both the SE and ATM-C models have scored higher in this regard due to having better-equipped administrative staff who follow structured processes with due documentation, which are partly driven by the expectations from their project sponsors and financiers who desire full transparency in administrative and procurement affairs. However, these two models have not scored in the higher quadrant in terms of corruption since their reports are not made publicly available but shared with only their project sponsors.

### 4.1.5. Capacity

*Table 31 Capacity across all models*

| Indicators | WOP 1 | WOP 2 | CBO-NS | CBO-S | SE | ATM-NC | ATM-C |
|---|---|---|---|---|---|---|---|
| **5. Capacity** | **40.0** | **57.5** | **40.0** | **35.0** | **42.5** | **22.5** | **40.0** |
| **5.1.** Capacity support to the water services providers | 40.0 | 65.0 | 40.0 | 30.0 | 65.0 | 20.0 | 35.0 |
| **5.2.** Capacity support to the service authority (DWASA) | 40.0 | 50.0 | 40.0 | 40.0 | 20.0 | 25.0 | 45.0 |

Scores across the capacity dimension have shown large variations across models, with the WOP2 model scoring the highest, while on the other end of the spectrum, the ATM-NC model scores a fraction of that of WOP2.

For the CBO-led models studied, it was found that information on the performance of water services providers is not collected in a structured manner and capacity building programs, although held during program intervention period, are initiated from the top-down and do not take into account the capacity gaps of a specific site/CBO. Under the CBO-led models, the implementing NGO is commissioned to perform capacity building of the CBOs. Such trainings happen on a project-by-project basis, whereby multiple CBOs or a single CBO under a particular project are trained but these training sessions are not tailored to address a particular CBOs' gaps as training needs assessment are not conducted. The frequency and type of training depend on the project stakeholders and are generally planned ahead of time. Post-project capacity support programs (such as refresher trainings) are typically not built into CBO-led models and post-intervention. After project completion, CBOs typically rely on training from other WASH-related projects for capacity building. For example, a CBO-based toilet construction project by a different NGO within the same LIC can conduct training of that particular CBO in financial management, the contents of which may also be applicable for the CBO in performing their water service provision duties as well.

The capacity gaps of CBOs under the CBO-led models was more apparent than that of commercial operators, and much more so in the case of completed or elapsed CBO-based projects. This is to be expected as CBO members are chosen from within the community more for their social standing than technical abilities, and because they perform the role of a CBO as a volunteer activity.

In terms of capacity support to DWASA, purveyors of the CBO-led models such as DSK and Sajida were found to have conducted LIC customer relationship management training for DWASA staff in the zonal offices in the past. In addition to this, the WOP2 project had offered technical and managerial capacity support to DWASA staff (covering both DMA managerial staff as well as MODS Zone Engineers) in the design, maintenance and managementof a high-pressure network system through the use of external consultants. Apart from the training itself, hands-on training was also provided by short-term experts hired by the WOP2 project to MODS Zone staff to complement the classroom training. For this reason, the WOP2 models scores the highest in the capacity dimension. DWASA itself

was not found to have any dedicated funding for training as it relates specifically to LICs water service provision.

### 4.1.6. Learning and knowledge management

*Table 32 Learning and knowledge management across all models*

| Indicators | WOP 1 | WOP 2 | CBO-NS | CBO-S | SE | ATM-NC | ATM-C |
|---|---|---|---|---|---|---|---|
| **6. Learning and knowledge management** | **60.0** | **65.0** | **60.0** | **70.0** | **45.0** | **10.0** | **20.0** |
| **6.1.** Learning and knowledge management | 60.0 | 65.0 | 60.0 | 70.0 | 45.0 | 10.0 | 20.0 |

In the learning and knowledge management dimension, all the CBO-led models perform relatively strongly (though far from ideal). The SE model underperforms in this regard, while the two ATM models exhibit poor performance when it comes to learning and knowledge management.

Knowledge, skills and experiences on LIC water services planning, implementation and operation are occasionally shared between stakeholders, particularly among those stakeholders operating under the CBO model and SE models. Major WASH stakeholders involved in learning and knowledge sharing involve include WaterAid, WSUP, VEI, DSK, SJP, SAJIDA, NDBUS and BASA, among others. These learning sessions generally take place in the form of knowledge exchange workshops or reflection workshops under various projects conducted by the implementing partners on a project-by-project basis. As a consequence, learning and knowledge management generally stronger amongst enlisted CPCR partners - but due to the project-by-project basis approach, often these exchange mechanisms not sustained beyond a given project's duration.

The monthly coordination meetings convened under the leadership of the CPCR Unit of DWASA can be considered a limited learning opportunity as they are designed to deal in a reactive manner to issues faced by LICs. But the participation of multiple stakeholders does allow for application of past lessons in dealing with issues at hand.

### 4.1.7. Harmonization and alignment

*Table 33 Harmonization and alignment across all models*

| Indicators | WOP 1 | WOP 2 | CBO-NS | CBO-S | SE | ATM-NC | ATM-C |
|---|---|---|---|---|---|---|---|
| **7. Harmonisation and alignment** | **67.5** | **70.0** | **67.5** | **68.8** | **45.0** | **17.5** | **45.0** |
| **7.1.** Harmonisation and alignment | 75.0 | 75.0 | 75.0 | 75.0 | 40.0 | 10.0 | 65.0 |
| **7.2.** Collaboration and coordination | 60.0 | 65.0 | 60.0 | 62.5 | 50.0 | 25.0 | 25.0 |

Similar to the learning and knowledge management dimension, all the CBO-led models perform relatively stronger, followed by SE and two ATM models across the harmonization and alignment indicators.

Although there is no uniform national model for water service provision to LICs by DWASA, the CBO-led models (with the exception of the ATM-NC model) are clearly preferred, as they align closely with the DWASA philosophy that service users, especially LIC users, should not pay more than the formalized water tariff to access water services. DWASA is politically sensitive to the fact that SE users are paying substantially higher rates than the tariff rate, when O&M costs are added on, which is why it prefers the CBO model over the expansion of the SE model.

Although the WASH sector stakeholders coordinate with each other, they are opportunities for collaboration are limited around their own models, with the exception of SE model, which benefits from the presence of SJP as a partner of the DWASA CPCR Unit. The two Water ATM models, in contrast, are isolated from others as they do not fall under the purview of the CPCR Unit. The ATM-C model of Drinkwell, however, does have political

backing from DWASA through its dedicated sub-committee – as evidenced by the expansion of the Water ATM network to 300 points, which is expected to continue.

In conclusion, DWASA, after establishment of the CPCR unit is indeed promoting the CBO model above others (harmonizing) alongside the commercial Water ATM model. However, DWASA is not making any conscious efforts for the different CBO models to exchange their unique experiences and contribute in developing a CBO format that takes the best from each one model (aligning). In the absence of DWASA to lead such an "alignment" initiative, implementing NGOs such as DSK and SAJIDA Foundation has emerged as leaders who are influencing the future direction of CBO models, although the particular CBO model to be adopted relies very much on the.

Apart from the regular coordination meetings, the collaboration and coordination efforts are usually project-specific and are not designed to achieve economies of scale.

### 4.1.8. Environment

*Table 34 Environment across all models*

| Indicators | WOP 1 | WOP 2 | CBO-NS | CBO-S | SE | ATM-NC | ATM-C |
|---|---|---|---|---|---|---|---|
| **8. Environment** | **75.0** | **75.0** | **75.0** | **75.0** | **70.0** | **75.0** | **30.0** |
| **8.1.** Environment | 75.0 | 75.0 | 75.0 | 75.0 | 70.0 | 75.0 | 30.0 |

All CBO-led models along with the SE model perform better in the Environment dimension. Only the ATM-C model exhibits a weak score.

DWASA is not known to have any specific regulations in place mandating the carrying out of environmental and social impact assessment, as part of any project for water services provision in LICs. Donors for both the CBO and SE models, however, typically have their own mandates to conduct formal social and environmental impact assessment prior to site selection, which are commissioned by the donors. In other cases, the implementing NGOs do the impact assessment after site selection. When environmental or social impact evaluations are performed by the implementing NGOs they may be done informally and a formal report may or may not be submitted to the project financier, depending on the project requirements.

As a consequence, it is unclear to what extent the assessments done under CBO-led and SE models identify requirements for remedial and corrective measures and whether remedial actions are actually implemented accordingly. However, consultations with community members and CBOs relating to these models, suggest that any issues are usually resolved mutually through discussion before proceeding with project implementation.

For the ATM-C model of Drinkwell, only a market survey had been conducted to ascertain whether there is any demand for potable drinking water at the offered prices in the vicinity of approximately 700 DWASA water pump locations. No environmental or social impact assessment is performed as it is deemed unnecessary, since the booths are set up within the enclosed premises of DWASA.

### 4.1.9. Quality of service

*Table 35 Quality of Service Across Models*

| Indicators | WOP 1 | WOP 2 | CBO-NS | CBO-S | SE | ATM-NC | ATM-C |
|---|---|---|---|---|---|---|---|
| **9. Quality of service** | **58.8** | **71.3** | **52.5** | **54.4** | **66.9** | **33.8** | **48.8** |
| **9.1.** Water quality and sufficiency | 60.0 | 75.0 | 45.0 | 53.8 | 75.0 | 45.0 | 30.0 |
| **9.2.** Continuity and equitable service delivery | 50.0 | 70.0 | 45.0 | 52.5 | 45.0 | 40.0 | 50.0 |
| **9.3.** Acceptability and affordability | 65.0 | 72.5 | 75.0 | 67.5 | 85.0 | 25.0 | 50.0 |
| **9.4.** Supply interruptions | 60.0 | 67.5 | 45.0 | 43.8 | 62.5 | 25.0 | 65.0 |

In terms of water quality, the WOP2 and the SE models stand out as best performers, with a higher proportion of surveyed beneficiaries indicating the water received is always or mostly clear. The WOP2 model also scores highly in this regard primarily due to round-the-clock availability of services, quick turnaround time by DWASA in cases of issues so far and the unusually small proportion of households using alternative water sources – although this can also be attributed to the absence of illegal water suppliers as alternatives now that the project is still 'active'. The quality of service for the SE model is deemed to be among the best primarily due to the to the level of service, allowing users to access water directly from within their households – greatly improving access to all members of the household.

In contrast, the aged CBOs such as the Satellite slum and the WOP1 site have performed relatively worse in this dimension due to the proliferation of illegal water lines, facilitated by a decline in legal water supply quality impacted by low water pressures due to falling water table height. Therefore, as much as 26% of the City Polli (CBO-S model) residents surveyed indicated suffering from service interruptions on a daily basis, while on the other end of the spectrum, none of the users of the WOP2 and ATM-C models did.

Insufficient water is a major issue observed with the CBO-NS model. This possibly highlights the pitfall of technology selection without reservoir, where supply is now low and below demand as a result of low water pressure post-project. All SE model (with storage) users, on the other hand, felt water was available in the quantity necessary. Despite it being a non-storage model, WOP2 users also ranked water sufficiency in the higher bracket, no doubt a positive consequence of the project's close cooperation with DWASA to ensure continued supply. The WOP2 model and the SE model also ranked among the top models in terms of downtime issues being solved within 24 hours, while the CBO-S, CBO-NS and ATM-NC models lagged behind. A note of caution here is that the projects where these two models are still ongoing or 'active'.

In regards to service affordability, City Polli LIC residents (CBO-S model) felt the service was most unaffordable, while ATM-C and SE users said theirs was most affordable. Interview responses suggest that the operators of the ATM-C and SE services provided added benefits (household level connections and potable water) that justified the higher price charged. Another hypothesis that remains untested is whether users of these commercial water services were the more affluent among the LIC users, when compared to CBO-led service users.

## *4.2. Summary of Risk Assessment across Models*

Table 31 below summarizes the performance of the various models across the eight identified risk categories. The score for each risk category has been calculated by averaging (i.e. by dividing the aggregate risk category score by the number of risks that risk category is constituted of) and shown here against each model.

*Table 36 Risk Assessment Across Models*

| Sl | Model Name | Name of Site/LIC | Political Risk<br>Average of 3 constituent risks | Regulatory Risk<br>Average of 1 constituent risk | Investment Risk<br>Average of 1 constituent risk | Operational Risk<br>Average of 4 constituent risks | Financial Risk<br>Average of 4 constituent risks | Tariff Risk<br>Average of 1 constituent risk | Environmental Risks<br>Average of 1 constituent risk | Total<br>Average of 15 constituent risks |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | WOP1-NS | Hazi Sobhan Road | 3.0 | 1.0 | 6.0 | 5.0 | 5.7 | 6.0 | 3.0 | **4.4** |
| | WOP2-NS | Zamindar Bari | 2.0 | 1.0 | 4.0 | 3.0 | 3.0 | 6.0 | N/A | **2.9** |
| 2 | CBO-NS* | Satellite | 6.0 | 1.0 | 6.0 | 4.5 | 6.7 | 6.0 | N/A | **5.3** |
| 3 | CBO-S* | Satellite | 8.0 | 1.0 | 6.0 | 5.5 | 5.7 | 6.0 | N/A | **5.8** |
| | CBO-S* | City Polli | 3.7 | 1.0 | 4.0 | 4.5 | 3.3 | 9.0 | N/A | **4.1** |
| 5 | ATM-NC | Robidashpara | 2.7 | 6.0 | 9.0 | 6.3 | 6.7 | 6.0 | N/A | **5.7** |
| 4 | SE | Bhashantek | 5.3 | 4.0 | 6.0 | 3.8 | 6.0 | 9.0 | N/A | **5.2** |
| 6 | ATM-C | Kadamtala | 2.0 | 2.0 | 2.0 | 4.0 | 5.0 | 3.0 | N/A | **3.6** |

**Notes:**

i. A high score indicates a high risk.

ii. The lowest possible average risk score across each risk dimension is 1.0 and the highest possible average risk score is 9.0. N/A denotes a risk that is not applicable for a particular model.

iii. Risk values have been shaded according to the matrix below that links risk assessment to risk management options:

| **Risk Assessment** | | | | | | | **Risk Management** | |
|---|---|---|---|---|---|---|---|---|
| | | | **Probability** | | | | **Score** | **Risk management strategy** |
| | | | **High** | **Medium** | **Low** | | 9 | Rethink project viability |
| | | | **3** | **2** | **1** | | 6 | Mitigation Plan Needed |
| **Impact** | **High** | 3 | 9 | 6 | 3 | | 3 to 4 | Review and address |
| | **Medium** | 2 | 6 | 4 | 2 | | 2 | Monitor |
| | **Low** | 1 | 3 | 2 | 1 | | 1 | Accept and Ignore |

As the table shows, the ATM-NC and the CBO-S models have been found to be the most prone to risks, while the WOP2 NS and the ATM-C models have been found to be the least prone. Across the various risk categories, there are also divergences in scores, with regulatory risk and environmental risks, for example, being heavily skewed towards a particular model. On the other hands, some categories such as financial risks and operational risks were applicable for all models across the board.

It should be noted that presenting risk category scores by averaging the risk scores of each constituent risks instead of presenting the aggregate risk scores under each risk category or using a weighted risk model was a conscious decision taken by the authors of this report as it was deemed to be a fairer and more objective representation of risks across models.

The following sub-sections elaborate further on the performance of the models across each of the risk categories:

### *4.2.1. Political Risk*

Political risks relate to the local political environment in the LICs and how they relate to the model in question. The three main political risks identified relate to the likelihood of users switching to alternative sources of water (typically illegal water connections) due to more reliable supply, to the threat of eviction and to the risks of opposition from local political groups. Political risk here mostly alludes to the presence of powerful vested interests that resist the new water system because it undermines power structures and/or upsets and income stream from illegal services provision.

All the CBO sites, with the exception of WOP2-NS (Zamindar Bari) had a strong presence of illegal water line providers, which increased political risk considerably. However, the lower risk score of the WOP2 model in this category should be taken in context of the fact that it is an ongoing project and it is not certain that the status quo would continue after formal conclusion of the project. Among sites with high presence of illegal lines, Satellite

LIC stands out because near the reservoir location, numerous illegal lines are in operation. In addition, sabotage activities directed at the CBO-led water system and a moderate threat of LIC eviction have led to the highest political risk for this model. Bhashantek LIC was another site where local political groups had actively resisted expansion of the service. By contrast, the ATM-C model, with strong political backing from DWASA and physical presence in DWASA owned land, faced the least threat in this risk category.

### 4.2.2. Regulatory Risk

This risk category relates primarily to regulatory support for a particular water service delivery model by DWASA. The sites under the CBO-led water points and the Drinkwell Water model face relatively lower regulatory risk. The former is well accepted within DWASA as the preferred model of reaching LIC users at the formalized DWASA tariff rates. The latter also has political backing from DWASA with significant financial commitments in terms of operation of the Water ATMs, which are expected to grow in the future with the continued expansion of the Water ATM network. The CBO-led Water ATM is at the highest risk of discontinuation as the DWASA does not have much insights in this particular model and advocacy for this particular model is non-existent. The Social Enterprise model of Bhashantek also faces regulatory uncertainty as DWASA is hesitating to promote further expansion of a model that charges LIC users rates that are higher rates than those charged by DWASA. However, this regulatory uncertainty is only expected to impact future expansion plans. A rollback of services in Bhashantek LIC is not likely.

### 4.2.3. Investment Risk

Investment category risks mostly relate to the risk of service bottlenecks due to unforeseen capital expenses and rise in demand. CBO-led projects that are still ongoing ('active') face relatively lower investment risks by virtue of having fewer infrastructure-related issues and a sizeable capital replenishment fund to deal with repair and rehabilitation needs in the immediate future. Such problems may arise later though. Completed projects such as the Satellite LIC and Hazi Sobhan LIC have no or little capital funding reserves left as they have already been utilized. The CBO-managed Water ATM at Robidashpara faces the greatest investment risk, as the model was found to lack the necessary revenues to pay for operation and maintenance costs let alone cover any significant capital expenditures. The commercial Water ATM site faced the least threat of investment risk as DWASA involvement in booth operations ensure continued water supply and technical inputs from Drinkwell are assured with donor support in the near term.

### 4.2.4. Operational Risk

Operational risk is the broadest category of risks and encompasses the threat factors that can disrupt water service delivery adversely including potential decline in customer demand due to discontinuation of hygiene awareness programs, persistent daily service interruptions leading to customer attrition, inability to mobilize DWASA in dealing with water supply issues and complaints, and skill deficiencies of the CBOs and operators negatively impacting the service performance and professionalism.

In this aspect, completed CBO-led sites faced the greatest risk as they were more likely to have finished with their community awareness and CBO training programs, while the discontinuation of support by the NGO counterpart may have contributed to their inability to counter service interruptions and their absence of a direct channel to DWASA. By contrast, the WOP2 site of Zamindar Bari and the Drinkwell Water ATM faced the least threats, attributed to their close relationship with DWASA that ensures that service issues can be quickly countered. The ATM-C model further benefits from having its own fleet of technicians to deal with operational issues, while the WOP2 sites have recurring hygiene awareness programs and also contribute to training not only the CBO but also building the capacity of DWASA.

### 4.2.5. Financial Risk

The financial risk category is primarily concerned with the ability of service delivery operators to meet necessary cost commitments to keep the service operational, whether through user payments or external contributions. Completed CBO-led projects such as in the Satellite LIC, Robidashpara LIC and Hazi Sobhan LIC have smaller available funds to deal with O&M and capital replenishment costs and thus face higher financial risks. The financial risks of the 'active' projects (Zamindar Bari and Bishantek) may well increase after their completion. Despite the dependence of the commercial Water ATM and social enterprise models on government funding and donor funding respectively to cover financial gaps, these contributions are not at threat of termination and are expected to continue in the near term, resulting in lower risk exposure.

A special risk factor in the case of CBO-led models was the possibility of CBO signatories becoming unavailable due to relocation or death or otherwise, without a formal transfer of power, leaving no recourse for to access retained funds from the CBO bank account. However, the impact of this risk eventuality was diminished as NGOs such as DSK are actively working to update CBO model contingencies in the case of such an outcome.

### 4.2.6. Tariff Risk

Tariff risks relate to the threat of rising water tariffs from DWASA going on to negatively impact customer retention and operational viability. Rise of tariffs is a very real threat to LIC residents – particularly those under a CBO-led model - as billing rates are pegged to DWASA's formal tariff rates, which have been rising each year for the past three years and this trend is expected to continue. In the City Polli LIC, although the threat is equally higher from rising tariffs, if not higher than other CBO-led sites, the DWASA tariff makes up only approximately 11% of the selling price of water, and hence the impact will not be as high as in other CBO-led models which face an affordability crisis. The Bhashantek LIC is also susceptible to tariff increases as LIC users are reluctant to pay the already high tariffs. Tariffs that are even higher will increase reluctance to pay and may in the end make the model financially unfeasible if external subsidies are not available. The Drinkwell ATMs are unlikely to be affected by DWASA tariff prices and retail prices are expected to be stable in the near term as has been observed in the past few years.

### 4.2.7. Environmental Risks

The major environmental risk identified was in terms of water wastage in the Hazi Sobhan Road LIC, where dirty contaminated water had to be flushed out for a considerable time on a daily basis, which also had financial implications for landlords as they are billed on the volume of usage by CBOs.

# Chapter 5. Conclusions and Recommendations

## 5.1. Conclusions

DWASA should be commended for taking the initiative to provide the entire LIC population of Dhaka with legal water services and for setting up a dedicated CPCR Unit to ensure its realization. To date nearly 700,000 slum dwellers in 435 LIC areas are served from the DWASA networks through legal water connections. Realizing full coverage is undoubtedly a considerable challenge, however, as Dhaka is reported to have about 4 million slum dwellers spread over 5,000 slums.

As things stand, however, the DWASA has considerable scope of improvement in demonstrating leadership as they have not yet laid out a specific LIC strategy, policy or investment plan, nor has it formulated targets, benchmarks, standards, etc. This gap is only partially filled by other stakeholders, most prominently by some of the reputable and larger NGOs that have over many years first developed and gradually modified the LIC service provision models. Among the most notable of these models is the widely-applied non-commercial CBO model. In Dhaka, a number of models are being used at the same time by various actors to provide the low-income community with legal water connections.

Among the not-for-profit models in operation, the Community-Based Organization (CBO) model is clearly the dominant operational structure. The CPCR unit of DWASA, dedicated to water supply provision to LICs has a clear preference for the CBO-led models and envisions it as a long-term solution to formalize water service delivery to LICs. CBO-led models are characterized by the high level of involvement of a selection of the community members in the day-to-day operationalization of the model, usually through an unremunerated role. The CBO-led model also seeks to involve the community members in the planning, design & construction and decision-making stages of a project. The main commercial models identified were the Social Enterprise model, whereby a social enterprise is providing piped household-level connections to users and the ATM-C model, where Drinkwell, a Water ATM technology provider has partnered with DWASA to provide potable drinking water via vending machines operated through prepaid customer cards.

***Quantitative Performance Evaluation***

The 7 WASH service delivery models identified under this study - classified along two dimensions, technology and operational structure – were found to have varying degrees of effectiveness both in terms of performance and risk exposure.

*Figure 58 Overall Performance Scores for WASH Service Delivery Models*

| | Scores Worst to Best | MODELS1 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | WOP1 | WOP2 | CBO-NS | CBO-S (Satellite) | CBO-S (City Polli) | SE | ATM-NC | ATM-C |
| Performance Scores | 0-100 | 55 | 62 | 57 | 56 | 55 | 61 | 35 | 48 |
| | Performance Ranking | 5 | 1 | 3 | 4 | 6 | 2 | 8 | 7 |

All seven models under investigation have demonstrated sub-optimal performance, in that none of them are able to achieve a high average performance score of near the ideal score of 100%. The CBO-led WOP2 model (with a score of 62.4%) and the SE model (with a score of 61.2%) come out as the best performing models overall. The models positioned in the middle are all CBO-led sites, in the order of CBO-NS, CBO-S (Satellite LIC), WOP1 and the CBO-S (City Polli). The lowest performing models are both Water ATM models, with the ATM-C model performing better than its CBO-led counterpart, which scored lowest at 35.2%.

*Table 37 Performance Scores for WASH Service Delivery Models Across Dimensions*

| SL | Dimension | WOP 1 | WOP 2 | CBO-NS | CBO-S | SE | ATM-NC | ATM-C** |
|---|---|---|---|---|---|---|---|---|
| 1 | **Policy, legislation and institutions** | 66 | 74 | 71 | 68 | 77 | 61 | 82 |
| 2 | **Financing for life-cycle costs** | 35 | 48 | 50 | 38 | 55 | 24 | 73 |
| 3 | **Planning** | 47 | 45 | 50 | 38 | 69 | 35 | 28 |
| 4 | **Transparency and accountability** | 48 | 57 | 52 | 48 | 70 | 38 | 68 |
| 5 | **Capacity** | 40 | 58 | 40 | 35 | 43 | 23 | 40 |
| 6 | **Learning and knowledge management** | 60 | 65 | 60 | 70 | 45 | 10 | 20 |
| 7 | **Harmonisation and alignment** | 68 | 70 | 68 | 69 | 50 | 18 | 45 |
| 8 | **Environment** | 75 | 75 | 75 | 75 | 75 | 75 | 30 |
| 9 | **Quality of service** | 59 | 71 | 53 | 54 | 67 | 34 | 49 |
| | **Average Across All Dimensions** | **55** | **62** | **57** | **55** | **61** | **35** | **48** |

** Color shades indicate relative performance across each dimension. A green shade indicates scores of 70 and above, yellow shade indicates scores between 30 and 70, and red shades indicate scores of 30 or lower.*
*** Although the ATM-C model is meant for use by low-income households, it is not exclusively meant for use by LIC residents and its booths are not located within any LICs. Hence, the performance evaluation indicators used for assessment in this study were, in many cases, not directly applicable to the ATM-C model, since the evaluation criteria were biased towards performance in an LIC-based context. Readers should be aware that ATM-C model was included with the specific understanding that its performance would not be held to the same standards as the other LIC-based water service delivery models evaluated under this study.*

At the disaggregate level, it is interesting that the CBO models and the SE model come out with different scores along different dimensions, yet achieve similar overall. When looking at the scores for the 9 dimensions of performance, it can be seen that the environmental dimension is not distinctive; among the other 8 dimensions, the WOP2 model scores the highest in 3 of them (capacity, learning and service quality), while the SE model also has the higher scores in 3 dimensions, albeit in different dimensions (policy, planning and transparency). However, due to the vastly different operational structure and choice of technology recommending a singular model is not as simple as combining the best dimensions from each of the models, and this possibly warrants a follow-up study on whether a singular universal model can be designed at all.

It is also a revealing finding that other than in the case of the ATM models, the scores do not favor one other technology or operational mode over others. In fact, the best performing WOP2 model combines non-commercial operation with no storage and the second best one, the SE model combines the exact opposites, namely commercial operation with storage. This would suggest that rather than attributing the performance of the models simply to the operational structure or technology, other qualitative factors are also at work. For example, an important factor which must be kept in consideration when assessing these performance scores is that both the WOP2 or the SE model are part of ongoing projects and neither have stood the test of time in contrast to the WOP1, ATM-NC, CBO-NS and CBO-S (Satellite) sites where donor funding had formally come to a close for a period of time. Other examples of underlying success factors may also include the quality of the relationship of the service provider with DWASA and other contextual factors such as service providers' sincerity and the political environment within the LICs.

When it comes to the Quality of Service, which measures how the various models actually serve the LIC communities, the dimensional score shows that the WOP2 and SE are the better performers, followed by the other CBO models (WOP1, CBO-S and CBO-NS). The ATM models both perform poorly in this aspect.

*Figure 59 Quality of Service Across Models*

| Indicators | WOP 1 | WOP 2 | CBO-NS | CBO-S | SE | ATM-NC | ATM-C |
|---|---|---|---|---|---|---|---|
| **9. Quality of service** | **58.8** | **71.3** | **52.5** | **54.4** | **66.9** | **33.8** | **48.8** |
| **9.1.** Water quality and sufficiency | 60.0 | 75.0 | 45.0 | 53.8 | 75.0 | 45.0 | 30.0 |
| **9.2.** Continuity and equitable service delivery | 50.0 | 70.0 | 45.0 | 52.5 | 45.0 | 40.0 | 50.0 |
| **9.3.** Acceptability and affordability | 65.0 | 72.5 | 75.0 | 67.5 | 85.0 | 25.0 | 50.0 |
| **9.4.** Supply interruptions | 60.0 | 67.5 | 45.0 | 43.8 | 62.5 | 25.0 | 65.0 |

Among the WOP2 and SE disaggregated scores, the SE model clearly underperforms in continuity of supply (Indicator 9.2). This is due to the limited supply by DWASA (3 hours each day) that cannot be completely overcome by the overhead storage tanks of the LIC system. The low score is rather due to inability of DWASA to provide uninterrupted service and does not point to inherent problem of the model itself. Rather, without storage, the problem with the continuity of supply would likely be worse.

In terms of quality of service, large variances have been observed in the performance of the six CBO-led models that were explored. All CBO models in Dhaka have taken a common approach whereby the water is accessed through water points that are shared by a certain number of households. A major factor is the technology adopted for service delivery; conventional wisdom suggests that technologies with reservoir systems will offer better quality of service by virtue of storing water for use during times of low supply. For the most part this was indeed the case. However, the pressurized CBO-led model of WOP2 performed best among all the CBO-led models despite having no storage once again alluding to the WOP's unique partnership with the DWASA and the continued availability of financial and technical resources (until formal project conclusion) by virtue of still being an ongoing project. On the other hand, the only example of a CBO-led water vending machine was found to be largely ineffective due primarily to not having reached critical demand (due perhaps to the substantially higher pricing) to maintain operational costs sourced exclusively from the community.

### *Qualitative Findings*

This study has revealed that the distinctions between and the availability of different WASH service delivery models in LICs are, in most cases, not evident to the beneficiaries and water operators do not take any steps to make the options clear to beneficiaries. In addition, for all but one service delivery model (the ATM-C model), the service charter or service mandates of the water operator were not disclosed formally to beneficiaries, despite most models having some form of contract or agreement in place with other stakeholders that clearly delineated their roles and responsibilities.

The CBO-led models, which are the dominant not-for-profit operational structure, assume that CBOs will have their communities' interest at heart and will therefore opt for decisions that make financial and operational sense, rather than being driven by a profit motive. And as to be expected, the CBO model has led to services that are priced equal in terms of water tariff to those of 'normal' (non-LIC) DWASA customers. But the effectiveness of the CBO-led models also depends to a large extent on the stakeholders involved. Larger and reputable implementing organizations (NGOs) have disproportionate influence and advocacy capacity with other sector stakeholders notably DWASA, to ensure adequate service quality. However, despite these efforts by the NGOs, the quality of service in CBO-led projects was found to decline over time, which is most prominent after the formal conclusion of a project, when all responsibilities revert to the CBO, and donor funding ceases to contribute to replacement/repair of aging infrastructure.

Cessation of project funding also impedes the capacity building initiatives designed to empower CBOs to perform their roles as well as community-level awareness programs, as a result of which the acumen of CBOs and the reinforcement of positive beneficiary behaviors towards WASH practices declines over time. An additional gap that was identified in regards to training is that even during project operations, across the different sites, CBO training curricula and contents were not tailored according to a training needs assessment process. The CBO model adopters, however, were more active in performing capacity building of DWASA. These DWASA capacity building initiatives were most structured around customer relationship management but the WOP2 with its novel pressurized water supply system for LICs also undertook technical training of DWASA under its program mandate.

By virtue of wide replication of the CBO-led models, learning and knowledge management opportunities among the larger and more active stakeholders implementing the CBO model are relatively frequent and considered useful. These opportunities do include the NGOs but unfortunately do not extend to the CBOs, the actual LIC service providers. Furthermore, the CBO model's implementing NGOs have regular audience with the DWASA on a monthly frequency in the form of coordination meetings but these meetings are focused on reactive measures to challenges and issues faced in the field, rather than being a tool for planning and proactive course corrections taking into account past lessons learnt. The large variations in performance among the models across the learning and knowledge management dimension would suggest that all models, including WOP2 and SE could improve their performance if they were encouraged/ incentivized to learn from each other.

DWASA favors the CBO model but is not making an effort to develop a 'superior' CBO model by taking the best from each application. There are no efforts by other stakeholders to assume leadership. Instead, the collaboration between stakeholders is incidental and project-based only. The NGOs do adapt the CBO model, but these adaptations are derived primarily from their own experiences and only applied to their own projects. DWASA's support for the CBO model is among others based on the assumption that the users pay only the DWASA tariff, whilst other costs are funded separately and not from the tariff.

The decline in performance of CBO-led model over time can also be attributed to technical issues outside of CBOs' control such as lack of supply or low pressure, which may be due to a variety of reasons such as a drop in the height of groundwater table, increasing water losses or theft or unanticipated increases in water demand in the surrounding non-LIC communities. However, it can also be argued that if a thorough risk assessment was performed by the designers of the CBO-led models, corrective actions and mitigation strategies could have been prepared and then implemented to address them. Another major weakness of the CBO model is its failure to actively engage the wider LIC community, particularly given the "floating" nature of residents, who migrate frequently in and out of the LICs. Since water pricing is often packaged with house rent, payment of the water bill is the responsibility of the landlords, who have been observed to play the leading role within the CBO. This skewed representation is also guided by pragmatic considerations – a landlord is much less likely to migrate away and abandon their CBO duties than any other LIC resident. Consequently, tenants, particularly the disabled, minorities and the elderly have played a more limited role in CBO affairs than envisioned by the NGOs. Formal transparency and accountability mechanisms, although enshrined in the model, are often not practiced. Instead, informal complaint and resolution mechanisms prevail.

CBO-led models in certain localities have come under threat from illegal water providers after project completion, as it is the moment after NGOs' departure when CBOs no longer have easy audience to DWASA. The lack of a monitoring unit within DWASA has also been identified as an impediment, both in terms of not being able to assess legal consumer coverage within individual listed LICs with CBO operations, but also in terms of understanding which LICs in Dhaka city remain completely unserved. Apart from

monitoring service delivery coverage and quality, water quality monitoring in LICs is also not conducted by DWASA; ongoing projects tend to conduct water quality testing through third-party laboratories but such water quality monitoring is not continued after conclusion of projects.

Regular payments towards an O&M fund and capital fund, as to be expected in an ideal CBO-led model, were made only by a small minority of LIC residents post-project, which affected the long-term viability of the model. In one location (Satellite LIC), at least one water point was found to be completely out of commission due to lack of repairs. Despite its many apparent weaknesses, the CBO model remains a resilient model and when roles and responsibilities are performed as envisioned, including a continued engagement of the NGOs, has a high potential to become a long-term solution to bringing legal water supply across all of Dhaka's LICs. However, without the active participation and a champion to spearhead the model, as seen in the case of the CBO-led Water ATM model, even CBO-led models are prone to go into obsolescence. Furthermore, depending on the implementing organizations and project sponsors, CBO-led model stakeholders, to a varying degree, take into account social and environmental factors when setting up a new water delivery service but depending on the implementers, recommendations from such an exercise may not always be fully documented or indeed used for modifying project plans.

In summary of the CBO-led models, as things stand, there remains a large gap between the envisioned performance and the reality on the ground. Although the WOP2 model performs the best among the CBO-led models, this performance should be taken into the context that it was among the ongoing projects studied and such ongoing projects performed significantly better than completed projects – making it uncertain whether the performance improvement of the WOP2 project locations will sustain after WOP's formal exit from the locations. WOP1's middling rank in terms of overall performance is a warning for WOP2. Secondly, it should also be noted that stakeholder interactions (particularly with DWASA) were organized by the operators of the WOP2 project, who may have had certain biases when it comes to knowledge of and preference towards the WOP2 model.

The main contenders to the CBO led models are the social enterprise (SE) model of SJP and the commercial Water ATM model of Drinkwell Water & DWASA (ATM-C). The SJP's SE model, the only model offering direct household connections to LICs in Dhaka city, is the second-best performing model evaluated under this study. The unique strengths of the SE model lies in its clear delineation of responsibility among internal and external stakeholders, more comprehensive inclusion of community members in the planning phase and superior water quality and sufficiency as rated by users, and the strong transparency, monitoring and reporting mechanism for the community and/or the project financiers.

Despite their commercial nature, both the SE and ATM-C models were found to be heavily reliant on external funding to cover capital expenditures and a vast portion of the O&M costs incurred. Among the two, the latter was found to have a stronger footing in terms of policy as a dedicated sub-committee within DWASA had taken up the cause for replication of the ATM-C model and has committed to expand the network of 200 booths by a further 50% (to a grand total of 300 booths in Dhaka city) in the coming years. It should be noted, however, that the ATM-C booths were found to be used mostly by non-LIC residents, with LIC residents making up a small fraction of 27% of all users, indicating the model has a long way to improve its pro-poor credentials.

However, despite being rated by users to be among the more affordable models (taking into account the added benefits of having household level connections), the SE model was not considered as a strong alternative to the CBO-led model by DWASA due to the considerably higher pricing, which made for adverse publicity (i.e. LIC users paying higher tariff to private operators than the tariff paid by affluent Dhaka residents to DWASA) that highlighted the social inequality. Ironically, the DWASA hesitation on the pricing of the SE model was not there with the ATM-C model that actually supercharges users (24 times the

DWASA rate) – perhaps attributable to the fact that it supplies potable drinking water and that the ATM-C model is championed by a different wing of DWASA, and not the CPCR Unit.

By virtue of having dedicated administrative and technical staff, both commercial models were found to be more significantly equipped in planning and forecasting lifetime or project lifecycle costs, formal complaints management and resolution, and monitoring and reporting of performance to sponsors and project stakeholders when compared to the CBO-led models. Quality of service is likely to be significantly better compared to the CBO-led models but this comes at the cost of a higher price. Note, however, that the evaluation of the SE model was performed using a much smaller sample of LIC residents, all of whom were SJP staff in addition to being users of the service. Hence, there may have been certain biases on the part of respondents, which could have influenced the evaluation outcomes.

As a whole, the commercial models were found less likely to seek extensive inputs from the community members during regular day-to-day operations. As a consequence of the limited replication of the models, they were also found to lack frequent learning and knowledge management initiatives that could have contributed to the continuous improvement of the models. Financing, however, remains the Achilles' heel of the commercial models as none of them have managed to break-even on operational and maintenance costs (the ATM-C model has, however, managed to cover its booth operation costs entirely but not the maintenance and overhead costs), let alone cover associated capital expenditures. This commercial challenge is not thought to be a matter of limitation of scale, since the SE model is facing break-even challenges even though it covers a considerable population in Bhashantek. Similarly, the commercial WaterATM is already functional with 170 booths across Dhaka city, which should have led them to realize significant economies of scale. Drinkwell anticipates all operational, maintenance and overhead costs of the ATM-C model to be covered through user contributions once the model is scaled up to 300 sites. However, it is unlikely that depreciation costs will be recovered at that point. The SE model is designed to be financially self-sustainable but the findings suggest that doing so will either require significant improvement of resource efficiency or an increase in the pricing structure. The latter does not seem feasible within most LICs in the present context – hence, the suitability of the SE model for wider replication in Dhaka city, removed from external support, remains a question mark. The dependence on external donors for financing also introduces multi-party risk into the commercial models as a whole.

Regardless of the model of service delivery, the financial pressure on all water operators - except for the DWASA/Drinkwell commercial ATM model - is expected to intensify in the near term, due to expected annual tariff increases by DWASA (as evidenced in the past three consecutive years) while at the same time the incomes of the LIC population have been impacted adversely by the pandemic-induced economic disruption. The threat of eviction and local political opposition from vested interested groups are also constant threats for operation in LICs, regardless of the model of service delivery but the scale of risks been observed to vary from site to site.

***Risk Assessment***

Among the models evaluated, the WOP2 (with a score of 2.9) and the ATM-C (with a score of 3.6) models had the lowest risk profiles. The risk score for the second-best performing model (SE) was considerably higher at 5.2, but it can be considered manageable. On a scale of 1-9 (higher score denoting higher risk, none of the models scored above a 6, which would have denoted significant risk that would warrant development of mitigation plans and even question the viability of project continuation. Having said that, the ATM-NC model with the second highest risk score, coupled with being the lowest-performing

model, is undoubtedly the weakest model evaluated and is not expected to sustain for long without external support.

*Figure 60 Risk Assessment Scores Across Models*

| | Scores Worst to Best | MODELS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | WOP1 | WOP2 | CBO-NS | CBO-S (Satellite) | CBO-S (City Polli) | SE | ATM-NC | ATM-C |
| Risk Scores | 9-1 | 4.4 | 2.9 | 5.3 | 5.8 | 4.1 | 5.2 | 5.7 | 3.6 |
| | Risk Ranking | 4 | 1 | 6 | 8 | 3 | 5 | 7 | 2 |

| Risk Assessment | | | | | | | Risk Management | |
|---|---|---|---|---|---|---|---|---|
| | | | Probability | | | | Score | Risk management strategy |
| | | | High | Medium | Low | | 9 | Rethink project viability |
| | | | 3 | 2 | 1 | | 6 | Mitigation Plan Needed |
| Impact | High | 3 | 9 | 6 | 3 | | 3 to 4 | Review and address |
| | Medium | 2 | 6 | 4 | 2 | | 2 | Monitor |
| | Low | 1 | 3 | 2 | 1 | | 1 | Accept and Ignore |

When looking at the risks, it does not appear as if any particular technology or operational mode comes with significantly higher or lower overall risk profiles. The overall risks for non-storage models range from 2.9 to 5.3; for the storage models the range is from 4.1 to 5.8 and for the ATM models are 3.6 and 5.7. The same inconclusive variation of scores applies to non-commercial models where scores range from 2.9 to 5.8, compared to the commercial models where scores are 3.6 and 5.2.

When comparing the best two performing models (WOP and SE), it can be seen that the environmental risk is not distinctive among the two models. Their diverging risk profiles are due to WOP2's lower risk exposure in all the remaining six risk categories, the score differences fluctuating between a low of 0.8 in the operational risk category up to a 3.3 for the political risk category. Rather than an inherent weakness in the operational structure itself, the higher risks for the SE model may have resulted from the specific circumstances such as the higher cost of the service resulting from the higher service level, the relatively small scale at which the model is applied (inability to take advantage of economies of scale from a single site in Dhaka), the absence of a champion that promotes the model with DWASA and the fact that DWASA does not consider the SE model as a valid alternative or welcome supplement to the CBO-led models. These differences in risk profiles between the two models would seem to suggest that the SE model may have lessons to learn from WOP2, which may be used to improve its own risk profiles.

Across the various risk categories, the more prominent observations among the models are as follows:

- Political risks: These mostly relate to the presence of local political groups and illegal water suppliers that resist the new, legal LIC water systems because these undermine power structures and/or upset and income stream from illegal services provision. These risks are location rather than model specific.
- Regulatory risk: This is a model-related risk that relates directly to the support for the model by DWASA. With strong support from DWASA, the CBO-led and ATM-C models face low regulatory risk, despite the very high prices for drinking water charged by the latter (24 times the DWASA tariff for regular water). The SE model enjoys less support and is unlikely to expand much, reportedly for charging higher rates than those charged by DWASA (2.2 times the DWASA rate). The ATM-C model is at a high risk of discontinuation for its lack of performance and representation at DWASA.

- Investment risk: This risk is primarily linked to the status of the project, with a high risk after completion when financiers tend to withdraw. As a result, completed projects have little or no capital reserves and are at higher risk. However, despite being an ongoing project, the SE model's dependence on door subsidies to install new connections (which entails substantial cost) remains a major risk. With secure long-term external support, the ATM-C model has the lowest risk exposure.
- Operational risk: This risk is lowest for the WOP2 and ATM-C models that enjoy good relations with and support from DWASA. The SE model also has a lower operational risk as they are well equipped for managing internal network issues. The completed CBO-led sites face a higher risk as training and awareness activities have come to an end, CBO membership is voluntary and NGO support is discontinued.
- Financial risk: The completed CBO-led projects, CBO-S (Satellite LIC), ATM-NC and WOP1 have little or no reserve funds and no access to a financier to cover financial risks. CBO-S (City Polli LIC) and WOP2 doesn't face this risk now, but that may change after project completion. The SE model, despite its immediate and mid-term donor support still is not close to covering most operational costs from its own operations.
- Tariff risk: With rates pegged to the annually adjusted DWASA rates, all models may face resistance from their users to pay higher rates and even difficulty to retain customers. In some locations this risk is higher, but that is location-specific rather than model-specific. The tariff risk is considered least for the ATM-C and ATM-NC models as users are already paying a high price for their treated drinking water, in which the DWASA tariff component is very small (approximately 10%).

Based on the study findings, the next section offers some best practices and prescriptive recommendations for improving the performance and risk profile of current and ongoing LIC interventions in Dhaka city.

## *5.2. Recommendations and Best Practices for DWASA*

The recommendations and best practices derived for DWASA from the conclusions of this research are presented in order of importance below:

***Recommendation #1.*** Develop central knowledge base on LIC WASH services provision

All stakeholders and especially DWASA need a much better understanding of the scale and scope of the challenge to provide WASH services to LICs. Although most stakeholders consulted in the course of this study had knowledge of existence of other models, the operational efficiencies and performance of the various models relative to each other were not widely known. This should not be the case as several stakeholder groups have been operating in Dhaka LICs for decades and have built up a wealth of internal knowledge that, once shared, could deliver important lessons and insights for the less experienced stakeholders. As it stands, however, much of this knowledge is institutional and does not reside in a codified manner that could be shared easily.

Although this study is anticipated to go some way towards removing this opacity, there should be a conscious effort from all stakeholders involved to develop a central knowledge base. During the course of this study, the authors could not find evidence of any central information repository on drinking water supply and sanitation to LICs. A dedicated learning and sharing mechanism should be established and supported, and encourage full support by all stakeholders. Hence, it is recommended that the initiative to build a central information repository accessible to all (possibly digital) should be taken up by either DWASA or the NGO Forum for Drinking Water Supply and Sanitation (DWSS).

**Owner:** DWASA/NGO Forum for Drinking Water Supply and Sanitation (DWSS)
**Key Stakeholders:** NGOs, CSOs and development partners

***Recommendation #2.*** Develop multi-stakeholder plan for WASH in LICs anchored by DWASA

As previously concluded, DWASA has not yet laid out a specific LIC strategy, policy or investment plan, nor has it formulated targets, benchmarks, standards, etc. The leadership void is therefore partially filled by other stakeholders, most prominently by some of the reputable and larger NGOs, who are also to an extent competing with each other and sometimes operate in their own siloed manner. DWASA must assume proactive leadership of the LIC agenda and formulate policy, strategy, an investment plan, develop a menu of approved LIC models, set targets, benchmarks and standards and seek donor and NGO support

Under the leadership of DWASA/CPCR Unit, it is recommended that a national/city-wide plan of action for LIC WASH service provision be drawn up with the participation of all major WASH stakeholders. Such a plan should focus on how WASH finance can be mobilized on a collective basis and the priority areas for the fund mobilization should be jointly decided. Now that DWASA has covered legal water supply to the majority of LICs on public land, the focus could be on bringing yet unreached LICs under formal water coverage, and the formulation of the action plan could include a detailed survey process across Dhaka city. Apart from geographical priorities, sector-specific priorities can also be set out in the action plan with time-bound goals and quantitative outputs.

Such an action plan could be modelled after the Bangladesh's Country Investment Plan on Nutrition, which was a multi-sectoral plan involving multiple line ministry, development partners, NGOs and private sector organizations, bringing all the parties into alignment over their priorities over the next five years. There is a need for such a sectoral plan for reaching LIC populations, whether through water service provision or fecal sludge management, as the existing Master Plans from DWASA are more geared towards expansion of the water supply and sanitation network and other technical issues.

Developing a comprehensive plan of action necessitates a strong base of knowledge to make informed decisions. But, as found through the course of this study, the CPCR unit of DWASA had to rely on secondary reporting from NGOs and development partners to develop monthly status reports. However, such self-reported numbers from the NGOs did not report did not provide any indication of the proportion of beneficiaries covered under each LICs. Furthermore, the CPCR unit did not actively maintain a repository of LIC sites which were yet unreached through legal water supply services. Therefore, it is recommended that the CPCR be additionally offered the necessary financial and institutional resources to establish and in-house monitoring unit. Such assistance can come from internal DWASA resources or borne by the WASH stakeholders, as evidenced in the structure of the CPCR's Revenue department (Zone-13), which is manned by staff of four different implementing NGOs. Furthermore, the testing of water quality on at least an annual basis, either through the DWASA's laboratories or through external testing/ certification agencies, should be introduced as a monitoring parameter across all listed LICs.

An action plan should also involve DWASA soliciting support for and leading a multi-stakeholder effort to define a limited number of sustainable LIC service models, considering the development, implementation and operational phases and including various technologies and operational models. And in doing so, DWASA needs to recognize that all present LIC models show sub-optimal performance, have elevated risk profiles and that most of the operational LIC systems are very likely in need of substantial improvement. DWASA should speak out in favor of knowledge exchange between the high-performing WOP2, SE and the ATM-C models and promote that their most successful characteristics be applied to each other and to the other models, in a drive to improve LIC services provision. The result of such an outcome can be a model or set of models which are either new iterations of the existing models or brand-new models.

Service delivery that revolves around a uniform model or set of models for LIC service provision can allow for pooling of resources from the different stakeholders in planning and in the subsequent implementation stages offer significant economies of scale, particularly for the CBO-led projects where there are numerous implementing organizations spanning hundreds of LICs. In the planning stage, a centralized, staggered plan to reach unserved LICs could help avoid future duplication of efforts to reach the same populations. During implementation, economies of scale can be achieved in terms of conducting training (including DWASA training, CBO orientation and refresher trainings) and knowledge exchange sessions – which are now conducted on a project-by-project basis. In addition, pooling of human resources centrally (i.e. technicians, trainers, engineers etc.) by implementing organizations with a dedicated funding can ensure that CBOs in post-completion areas have a fallback mechanism for requesting urgent post-project support. Pooling of resources can also allow advocacy efforts with DWASA to be more successful.

**Owner:** DWASA
**Key Stakeholders:** NGOs, CSOs and development partners

***Recommendation #3.*** DWASA should keep multiple models in contention which may be suitable in different LIC contexts

While the DWASA has explicit understanding that reaching all LIC beneficiaries across Dhaka city necessitates the use of different water service delivery models based on the application context, there is a clear preference for the CBO-led models and the Water ATM models. The social enterprise model of Bhashantek is considered sensitive from a cosmetic perspective as it charges LIC users higher rates (approximately 2.2 times) for water usage than their formalized water tariffs, which is the price charged from private landowners. This argument has its flaws as users accessing the service from private landowners in non-LIC areas also have to also count additional O&M cost on top of the formalized water tariff. So, it is to be expected that users of the social enterprise model will also pay a higher water bill. On the other hand, DWASA has no qualms in expanding the ATM-C network that charges users 25 times the DWASA tariff for normal water. Indeed, if DWASA wishes to perform comparisons on pricing between Bhashantek LIC and non-LIC areas of Dhaka, it should conduct a study that looks at the costs of delivering uninterrupted water to non-LIC households, which includes not only DWASA tariffs but costs of maintaining and operating underground and overhead storage tanks, water pumps and pipelines.

On the other hand, in the relatively more affluent LICs, residents may find the direct-to-home water service to be more desirable from a user experience and accessibility perspective, despite the higher price. This recommendation is suggested by the survey findings from this study, where it was seen that a higher proportion of the randomly surveyed users of the SE and ATM-C models found the services to be more affordable than the respondents from the CBO-led models. Hence, DWASA should reconsider its decision to withdraw support for the model and instead focus on playing more of a regulatory role to ensure that commercial and social enterprise service providers are charging a water service capped under a certain level.

**Owner:** DWASA
**Key Stakeholders:** NGOs, CSOs and development partners

***Recommendation #4.*** Introduce measures to empower and hold CBOs accountable

Given that the CBO-led models are the preferred options for DWASA to propagate water services within LICs, DWASA should introduce mandates that further empower CBOs to safeguard their service provision and make them more accountable to their community members. The first step in this process s to make community members aware of the service charters of the CBO. Although most CBO-led projects that reach the conclusion stage handover the service provision duties to CBOs in the form of an MoU, the actual roles and responsibilities of the CBO are not publicly disseminated to the communities. Such roles and responsibilities of the CBO should be displayed in the public domain at LICs so that residents are better informed of the level of service to expect. Secondly, to ensure that CBOs are actually representing the wider LIC community beyond landlords, DWASA and sector stakeholders can introduce a mandate specifying a minimum ratio of tenants to be among the CBO members – similar to how there is a requirement to have 50% female representation among CBO members. Such a ratio can be set by DWASA upon discussion with sector stakeholders and LIC residents. Thirdly, DWASA could seek to assimilate complaints regarding all CBO-related issues within its 16162 hotline, similar to how it has integrated the complaints mechanism for Drinkwell commercial ATMs. This can be a better alternative to the present practice where customer complaints are received informally and follow-up to such complaints are not tracked. Integration with the hotline can help ensure that complaints are logged into the system, formally tracked using a job number, assigned to responsible authorities with deadlines for resolution and, upon conclusion, can allow for evaluation and in-depth analysis of the effectiveness of the complaints mechanism and performance of relevant CBOs and responding agencies.

Finally, DWASA could seek options of including local law enforcement personnel or legal council representation as observer members of the CBO. As things stand, it is the responsibility of the CBO to monitor activities of illegal water lines within the LIC and report it to DWASA who is tasked with the response. However, the DWASA is not able to perform this role properly and illegal lines remain common throughout most LICs as seen in this study. The purpose of having a law enforcement representative within the CBO membership would be for that law enforcement representative to be kept abreast of the situation within that particular LIC in regards to the presence and threat of illegal water lines. It is though that the presence of a law enforcement personnel within the CBO can strengthen access for the community to seek legal action to evict or remove the illegal lines in an expedited manner.

**Owner:** DWASA and development partners
**Key Stakeholders:** NGOs, CSOs and CBOs

***Recommendation #5.*** Integrate regular planning events into the operations of the CPCR Unit

The only regular structured interaction between the CPCR unit and the LIC WASH stakeholders happens in the form of monthly coordination meetings. These meetings offer WASH stakeholders, encompassing implementing NGOs and development partners, a direct channel of communication with the CPCR for discussing reactive measures to challenges and issues faced in the field. As such, these coordination meetings cannot be viewed as tools for learning and knowledge management coordination between stakeholders. Given this constraint, the CPCR unit should take the initiative to introduce monthly planning meetings based on lessons learnt and past reflections and specifically designed to facilitate proactive discussion and planning. Risk monitoring can be a key component of such meetings.

**Owner:** DWASA
**Key Stakeholders:** NGOs, CSOs and development partners

***Recommendation #6.*** Expedite implementation of progressive tariff scheme of DWASA

Although CBO models had the lowest water tariff of all models, across several LICs (Zamindar Bari, Satellite LIC and City Polli in particular), it was noted that beneficiaries faced difficulties in affording their respective water service. The official DWASA water tariff, which is charged by the CBOs, has been increasing consistently over the past 3 years, leading to uncertainties in whether the LIC consumers will be able to afford it in the long-term if such a trend continues. According to community level interviews, the financial situation of LIC households have been made worse by Covid-19. To counteract this, it is recommended that the DWASA expedite approval and implementation of the planned progressive pricing scheme, which is pending formal approval. Such a progressive tariff scheme should, ideally, be finalized with inputs from LIC residents who are expected to be the key beneficiaries of the initiative.

**Owner:** DWASA
**Key Stakeholders:** LIC residents

## *5.3. Recommendations and Best Practices for WOP*

As previously mentioned, none of the models evaluated comprehensively outshone the others in all aspects and it is evident that each model has its unique strengths and weaknesses. Given that no clear "winner" across all dimensions evaluated and risk categories assessed has emerged that justifies a transition away from WOP's preferred model of CBO-led service delivery, this study has taken the liberty to suggest incremental recommendations to improve service performance in urban LIC areas by borrowing best practices and avoiding pitfalls as observed from the other models. The recommendations in a sequential manner, from a project lifecycle perspective, are presented in the following paragraphs. Although the recommendations below are framed from the perspective of the WOP project as the financier, decision-maker and implementer of LIC WASH projects, they may be equally applicable to other parties involved or contemplating involvement in LIC WASH service provision.

***Recommendation #7.*** Consult land administrators prior to site selection

In the very first stage before embarking on a new project, during the site/location selection process, WOP should take care to select LIC sites that are on public land, which according to interviews, tend to be less susceptible to eviction threats. They are also more conducive for service delivery from DWASA's perspective. Although eviction of slums on public land still continue, there may be room for dialogue with the largest owners of public land which host LICs (such as the NHA) to understand their long-term plans regarding particular sites and ensure that projects deliver value to LIC residents over the longest possible time.

***Recommendation #8.*** Conduct independent and comprehensive social and environmental impact assessment

Once a location has been finalized, a thorough, documented environmental and social impact assessment study should be conducted and any issues identified in the course of the study should be adequately addressed prior to proceeding with implementation. Such environmental and social impact assessments should be conducted by independent third parties, so as to ensure there is no bias in the assessment process.

***Recommendation #9.*** Educate community members on and engage them in the selection of technology and operational structure

In the next stage, when deciding on a particular approach, model or technology for WASH service delivery, WOP should take an open, non-committal approach and make it clear to the beneficiaries what their options are. Decision-makers and influential community members should also be allowed to visit other slums where different water service delivery models are being implemented in order to help them arrive at a decision. In eventually deciding on the approach for a particular LIC, WOP should take a "collaborate, not compete" approach. At the moment there is no clear reason to switch from a CBO-led nonprofit model to a commercial or social enterprise model, since the commercial models have not exhibited any clear edge in financial sustainability. But in the end, the decision should be made mutually by the community members, project financiers and implementing organizations to ensure full ownership of the operation post-project.

***Recommendation #10.*** Conduct thorough model and site-specific risk assessment and devise mitigation strategies prior to implementation, particularly for risks unique to the pressurized non-storage water supply system

According to DWASA, pressurized water service delivery is the future of LIC water technology, as envisioned under the DMA plan. If WOP decides to proceed with a pressurized water service technology for reaching LICs in zones that do not presently offer pressurized water service to any LICs within its jurisdiction, the projects should make provisions for training the respective DWASA zonal staff. This was attributed as a key success factor in the case of WOP2. However, pressurized systems without storage facilities do come with their own set of drawbacks, namely in terms of service discontinuity during water supply interruptions, as seen in implementations of other such systems globally. WOP should anticipate such scenarios in advance, particularly since external support for the WOP2 project is still ongoing and it is not clear if the level of support from DWASA at its present level will continue after WOP project financing ceases . If the WOP1 project is any indication, it may be very likely that the service quality will degrade upon formal closure of the project. Regardless of whether or not a pressurized or non-pressurized model is selected, specialists such as Engineers and Urban Planners could be included as part of the risk assessment process to ensure that long-term issues such as drops in water pressure (as seen across most older intervention sites) are anticipated and planned for.

***Recommendation #11.*** Take measures to improve composition and diversity of CBO leadership

If it is decided to proceed with a CBO-led model, WOP should take extra caution in the selection of CBO members. If necessary, background checks should be conducted on the CBO members to ensure they do not have any vested interests in water service provision in a particular LIC. In lieu of any requirements from DWASA, WOP should mandate a minimum representation of tenants within the CBO membership in order to ensure that landlords do not exercise a discriminatorily high influence in the CBOs' decision-making process. Although it is difficult to have stability in CBO leadership with tenants if the residence of tenants is only transient, implementing organizations can seek out other options to accommodate for this, such as having an intentionally rotational leadership. Perhaps a follow up study may be necessitated to explore and pilot various options on to improve diversity in CBO leadership.

***Recommendation #12.*** Publicly disseminate service charters and formalize complaints channels to improve accountability

To further improve accountability of CBOs, WOP should make public the service charter outlining the roles and responsibilities of the CBOs, which are already enshrined in most tri-party agreements between NGOs, CBOs and DWASA at present. The service charter should be on display in a public location so that LIC residents can seek remedies and resolutions if they feel that the CBO is not performing their roles adequately. To improve accountability further, complaints mechanisms could be made more transparent with a possible avenue being to lodge CBO-related complaints through DWASA's planned hotline for LIC-specific issues. This will help to address the current context where complaints are lodged informally and their resolutions or lack thereof, are not tracked.

***Recommendation #13.*** Pooling of technical and human resources with other sector stakeholders to achieve economies of scale and extend post-project support ability

Perhaps the biggest insight from this study is that CBO-led projects require considerable post-project completion support. Such support can be categorized in the form of financial support, training, awareness raising and monitoring support. Financial support alludes to the long-term CAPEX costs that are related to a particular project. Although many projects provide contributions to CBO funds to sustain future CAPEX costs, it is often done without any historical analysis or forecasting. Hence there is a clear need to conduct hardware lifecycle analysis to determine expected lifetime of hardware products and bake in long-term project costs beyond the short lifespan of a particular project to ensure improved sustainability. While WOP projects should make every effort to tailor training of CBOs based on a needs assessment exercise, they should also account for post-project completion refresher trainings to address the eventuality that CBO members are replaced and their level of skills decline over time. A frugal way to perform refresher training of CBOs could be to digitize training materials in the form of e-learning apps that could be accessed by CBOs on-demand long after formal conclusion of a project.

Post-project completion awareness raising activities and monitoring activities should be considered by WOP, and could be envisioned as something to be enabled through collective resource pooling. Given the large number of LICs with CBO-led WASH services, these two activities lend themselves to pooling to achieve considerable economies of scale. In such a case, there should be clear delineation of funding responsibilities among multiple parties.

## 5.4. Recommendations and Best Practices for other Stakeholders

Most of the recommendations outlined in the earlier section for WOP are applicable to other a large section of WASH stakeholders (including donors, project sponsors/financiers, project planners and project implementing organizations). This section elaborates further on a subset of those recommendations (in order of importance) and how they relate to the various WASH stakeholders.

***Recommendation #1.*** Conduct thorough project risk assessment and factor in mitigation strategies and contingencies for long-term eventualities

A key deficiency in the planning processes across various models, but particularly the non-pressurized CBO-led water point models, is that they do not account long-term eventualities such as a future drop in water pressures or the proliferation of illegal water lines post-project or inability of CBOs to afford replacement of expired hardware or increases in community demand due to growing LIC populations, among others.

Many of these eventualities are shaped by external factors – for example, the large drop in water pressure in elapsed project areas, as seen in multiple sites across Dhaka city, can be attributed to a fall in height of the underground water table. However, even though these are due to external factors, project planners and designers can be more cognizant of the risk by conducting a thorough pre-project risk assessment and devise mitigation strategies to deal with such issues before they occur. For example, new project designers can plan ahead for water supply redundancies arising from insufficient water pressure by emulating the WOP2 project's pressurized system. WOP2 has laid the groundwork in enhancing the capacity of DWASA in the design and management of a high-pressurized network, and establishing a demonstration example through pilot implementation of a CBO-led model. Interested partners may choose to replicate this model, that is likely to more sustainable by virtue of becoming a part of the planned District Metered Area (DMA) network expansion of DWASA. It should be noted here, however, that a pressurized non-storage infrastructure has its own set of risk and while the WOP2 model presently benefits from being an ongoing project, and it is not certain that the strong example set by the project will prevail when support from NGOs and financiers are withdrawn after project conclusion.

In a similar vein, planners can also have contingencies in place for risks that are considered internal to project stakeholders. One such risk is that of the CBO's failure to collect sufficient funds to maintain and conduct repairs/replacement of water point hardware. A potential mitigation strategy for these risks can be to conduct cost needs projection by analyzing and estimating hardware lifetimes and their expected replacement costs beyond the project horizon. Due to the large number of LICs with CBO-led operations and each with a different length of operation, the effort to estimate expected hardware lifetime and replacement/replacement costs can be a concerted effort by multiple sponsors and NGOs covering a large enough sample data set to arrive at an accurate representation of expected costs. Project sponsors can then assign contingencies to their projects based on these benchmark estimates to help address the related risks.

**Owner:** Project Sponsors and Financiers
**Key Stakeholders:** NGOs and CSOs

***Recommendation #2.*** Enhance participation of regular community members into existing CBO-led models in favor of landlords and other privileged members

In terms of inclusivity, although the CBO models outperform others in community engagement in planning and decision-making, it can be argued that the decision-making process is not fully inclusive as landlords play the key role in decision-making processes, and decisions do not take into account opinions from all population groups, particularly the women, the elderly and the disabled. Therefore, it is recommended that organizations implementing the CBO-led model should avoid delegating power overly to landlords and have a mandate of involving underrepresented community members. Although community members may be a more transient member of the community, having regularly elected CBO members from within the community will ensure that regular residents have an understanding of the CBO performance that may not be transparent to regular community members, while at the same time they will have the interests of the community at heart rather than that of the landlords.

**Owner:** Project Sponsors and Implementing NGOs
**Key Stakeholders:** CBOs

***Recommendation #3.*** Take steps to improve performance of CBO training and community awareness programs

The study has identified areas for performance improvements in regards to capacity building for CBOs by project sponsors and implementing NGOs. In particular, it was noted that CBO trainings are rarely tailored according to a structured needs assessment process conducted in advance of the training. Hence, financiers and implementing NGOs should take steps to integrate needs assessment as a regular part of their LIC operations. Secondly, such training programs often conclude upon formal closure of a project without any provisions for refresher training, as a result of which CBO performance declines over time – partly due to loss of skills/knowledge and partly due to attrition of CBO members over time. To address this, project sponsors and planners should plan long-term CBO training in mind – annual refresher trainings can be an inexpensive way to help retain training knowledge among CBOs and improve their quality of service to LIC residents. Sector stakeholders may also explore digital e-learning applications as an alternate and more frugal way of allowing for continued, on-demand training after a project has concluded. A set of multimedia-based training modules, developed with funding from multiple sector stakeholders, can become an important knowledge repository for all CBOs across Dhaka.

Community awareness programs also face similar issues with continuity after project conclusion. To help address this, project sponsors can conceive annual events such as "LIC WASH Day" devoted to raise awareness of good WASH practices within the community, drive up fundraising for CBOs from the community and make sure communities retain the best practices that they had adopted when projects were active. In order ensure continuity through these events, project sponsors should budget for such events in the long-term and seek partnerships with the implementing NGOs over the long-term.

**Owner:** DWASA, Project Sponsors and Implementing NGOs
**Key Stakeholders:** CBOs

***Recommendation #4.*** Educate Consumers on the universe of available water service delivery models prior to consultation and selection of a particular model

As it stands, current approaches to LIC water service provision do not prioritize the input of LIC residents on the exact specifications of the operational model and technology to be used. Organizations looking to implement a new service often have a pre-determined model, around which slight adjustments are made if any feedback is received from the community through consultations. Communities do not generally have the ability to opt for a fundamentally different model, for example a social enterprise model with direct household lines as opposed to a CBO-led water point model. However, it could be questioned whether consumers are aware of the other operational model and technology combinations available to them in the first place. Hence, the first step to involving the community in settling on the ideal model is to educate the LIC users of the universe of models being used across various other LICs prior to seeking community feedback on planned projects.

**Owner:** Project Sponsors and Implementing NGOs
**Key Stakeholders:** LIC Residents

In conclusion, the CBO-led model which has undoubtedly improved over time via trial and error through multiple iterations has several areas for improvement. At the same time, its wide replication in the context of Dhaka city also offers significant scope for exploitation in terms of service consolidation and reducing duplication. For the more affluent LICs, the commercial models, in particular the SE model with its household level connections, could be strong alternatives to the dominant shared, CBO-led water point model.

If DWASA, WOP and sector stakeholders are able to take suggested steps to improve upon the models and exploit potential economies of scale, they can not only improve the quality of service for beneficiaries but also deliver significant cost savings, which would be more important going forward as donor contributions may diminish over time as Bangladesh graduates from being an LDC country and as DWASA pivots to a more self-sufficient model.

# Chapter 6. **Annex**

## *Annex 1 – List of Institutional Stakeholders Interviewed*

Interviews with DWASA included those with:

| Sl # | Name of Respondents | Role | Zone/Unit |
|---|---|---|---|
| **1** | Abdus Salam Bepari | Superintendent Engineer | |
| **2** | Subroto Kumar Dev | Sub Assistant Engineer | DWASA MODS Zone 1 |
| | Al Amin | Executive Engineer | |
| **3** | Ashraful Habib | Executive Engineer | DWASA MODS Zone 10 |
| | Ashok Hawlader | Sub Assistant Engineer | |
| | Engr. Md. Jasim Uddin | Deputy Manager DMA | |
| **4** | Mir Mahadi Hossain | Senior Community Officer (SCO) & Divisional Head | Community Program and Consumer Relation Division |

Interviews with NGOs/social enterprises included, but were not limited to the following:

| SL # | Name of Respondent | Designation | Name of LIC Concerned | Name of NGO/Donor |
|---|---|---|---|---|
| **1** | Akhil Chandra Das | Project Manager | Haji Sobhan Road, Zamindarbari, Satellite Bosti (With Tank), Satellite Bosti (Without Tank), Robidashpara | DSK |
| **2** | M A Hakim | Joint Director-WASH | Haji Sobhan Road, Zamindarbari, Satellite Bosti (With Tank), Satellite Bosti (Without Tank), Robidashpara | DSK |
| **3** | Umme Sauda | Project Manager | City Polli | SAJIDA Foundation |
| **4** | MAH Sumon | Program Manager | Bhashantek | Shobar Jonno Pani |
| **5** | Mushfiqua Mosharref | Programme Manager | Bhashantek | Water and Life |
| **6** | Babul Bala | Project Manager | City Polli | WaterAid |
| **7** | Abdus Sattar | Senior Service Engineer | Kadamtala Water ATM (Non-LIC) | Drinkwell Systems |

# *Annex 2 – Dimensions, Indicators, Scoring Criteria and Trigger Questions for Adapted IRC Evaluation Model*

**Adaptation of the IRC Sustainability Assessment Tool to be used by LCP in the LIC study, Dhaka**
**Adapted by; LightCastle Partners and Maarten Blokland**

**Dimensions of the Assessment system**

1. **Policy, legislation and institutions**
   - **1.1.** Sector policies and stakeholder mandates
   - **1.2.** Service delivery models
   - **1.3.** Professionalization of community management
   - **1.4.** Regulation of service providers
   - **1.5.** Technology

2. **Financing for life-cycle costs**
   - **2.1.** Financial planning to cover all life-cycle costs
   - **2.2.** Asset management

3. **Planning**
   - **3.1.** Scaled up service provision
   - **3.2.** Inclusivity
   - **3.3.** Multiple water needs and sources

4. **Transparency and accountability**
   - **4.1.** Monitoring for services delivery
   - **4.2.** Accountability and civil society
   - **4.3.** Corruption

5. **Capacity**
   - **5.1.** Capacity support to the water services providers
   - **5.2.** Capacity support to the service authority (DWASA)

6. **Learning and knowledge management**
   - **6.1.** Learning and knowledge management

7. **Harmonization and alignment**
   - **7.1.** Harmonization and alignment
   - **7.2.** Collaboration and coordination

8. **Environment**
   - **8.1.** Environment

9. **Quality of service**
   - **9.1.** Water quality and quality
   - **9.2.** Continuous and equitable service delivery
   - **9.3.** Acceptability and affordability
   - **9.4.** Supply interruptions

## 1. Policy, legislation and Institutions

**Summary of scores**

| | 0 | 20 | 40 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|
| Sector reform and institutional mandates | | | | | | |
| Service delivery models | | | | | | |
| Professionalization of community management | | | | | | |
| Regulation of service providers | | | | | | |
| Technology | | | | | | |

### 1.1 Sector policies and stakeholder mandates

| | Score |
|---|---|
| Roles and responsibilities for water provision to LICs are not clear and not understood by all stakeholders; the stakeholders do not have the necessary knowledge, skills and financial resources to take on their roles and responsibilities | 0 |
| Roles and responsibilities for water provision to LICs are not yet clearly understood by all stakeholders; the stakeholders have little knowledge, skills and financial resources to take on their roles and responsibilities | 25 |
| Roles and responsibilities for water provision to LICs are only partially understood by all stakeholders; the stakeholders have partially been given necessary knowledge, skills and financial resources to take on their roles and responsibilities | 50 |
| Roles and responsibilities for water provision to LICs are mostly understood by all stakeholders; the stakeholders have mostly been given necessary knowledge, skills and financial resources to take on their roles and responsibilities | 75 |
| Roles and responsibilities for water provision to LICs are clear and understood by all stakeholders; all stakeholders have the necessary knowledge, skills and financial resources | 100 |
| Score given | |
| Justification of score given: | |

Trigger questions:

A. Are policies on the provision of WASH services to LICs in place?
B. Are these policies transparent, inclusive and equitable?
C. Do all stakeholders understand their roles and responsibilities for provision of WASH services to LICs?
D. Do all stakeholders have the required skills, knowledge and resources to carry out their role?

### 1.2 Service delivery models

| | Score |
|---|---|
| The various models for LIC water services delivery including roles, responsibilities and service levels are neither well known nor understood by any of the stakeholders | 0 |
| The various models for LIC water services delivery including roles, responsibilities and service levels are partially clear only to a subset of stakeholders. | 25 |
| The various models for LIC water services delivery including roles, responsibilities and service levels are either partially clear to all stakeholders or mostly clear only to a subset of stakeholders. | 50 |
| The various models for LIC water services delivery including roles, responsibilities and service levels are mostly clear and understood by almost all stakeholders. | 75 |
| The various models for LIC water services delivery including roles, responsibilities and service levels are clearly known and understood by all stakeholders | 100 |

| | |
|---|---|
| Score given | |
| Justification of score given: | |

Trigger questions:
A. Is there a locally agreed array of water services delivery models for use in LICs?
B. Are the roles and responsibilities of the stakeholders for each of these delivery models defined, broadly disseminated and agreed among them?
C. Are the levels of service associated with each delivery model clearly defined and communicated to the stakeholders?
D. Are options of community management and/or delegated management of the water services delivery models defined and shared with the stakeholders?

### 1.3 Professionalization of community management

| | Score |
|---|---|
| LIC communities are not legally mandated to manage the service, cannot delegate functions to the private sector and have no access to provide them with the necessary skills to manage the service delivery system | 0 |
| LIC communities have limited legal mandate to manage the service, cannot delegate most functions to the private sector and have limited access to provide them with the necessary skills to manage the service delivery system | 25 |
| LIC communities have partial mandate to manage the service, can delegate some functions to the private sector and are partially enabled to acquire the necessary skills to manage the service delivery system | 50 |
| For the most part, LIC communities are legally mandated to manage the service, can delegate functions to the private sector and are enabled to acquire the necessary skills to manage the service delivery system | 75 |
| LIC communities have full legal mandate to manage the service, can delegate functions to the private sector and are enabled to acquire the necessary skills to manage the service delivery system | 100 |
| Score given | |
| Justification of score given: | |

Trigger questions:
A. Is the management of LIC water services by CBOs and/or private parties permitted by national and/or local legislation, regulation, bye-laws, by contract with the services authority or otherwise?
B. Are the roles and responsibilities of the CBOs and/or private parties for LIC water services operation clearly defined and accepted by all stakeholders?
C. Can CBOs and/or private parties for LIC water services operation delegate certain functions to third parties and what are the rules for this type of contracting?
D. Do the CBOs have access to capacity building programs for the development of managerial and operational skills?

### 1.4 Regulation of service providers

| | Score |
|---|---|
| There are no formal understanding or contracts between the service authority (DWASA) and the water provider; there is no evidence that the provider is adequately empowered and resourced to deliver the LIC services | 0 |
| There is informal but no written understanding or contracts between the service authority (DWASA) and the water provider; there is no clear indication that the provider is empowered and resourced to deliver the LIC services by DWASA | 25 |
| There is a limited formal agreement in place between the service authority (DWASA) and the water provider; the provider is partially empowered and resourced to deliver the LIC services by DWASA | 50 |
| There is formal understanding between service authority (DWASA) and the provider; for the most part, regulation stipulates that the provider should be adequately empowered and resourced | 75 |

| | |
|---|---|
| Service levels and criteria are clearly defined in contracts between service authority (DWASA) and the provider; for the most part, regulation ensures that the provider is adequately empowered and resourced | 100 |
| Score given | |
| Justification of score given: | |

Trigger questions:

A. Are service levels and performance criteria clearly defined and understood by service providers and consumers in the LICs?
B. Does the service authority (DWASA) ensure that service providers in LICs meet service levels and standards?
C. Does the service authority (DWASA) ensure adequacy of resources and empowerment of the service provider so that the service can be effectively delivered?
D. In case of water services delivery by private parties, is there (a potential for developing) a market for tendering LIC water services delivery contracts?

### 1.5 Technology

| | Score |
|---|---|
| Technologies used have not been approved by DWASA. Future users have not been consulted on technology choice. | 0 |
| Technologies used have not been approved by DWASA. Only a limited number of users/community (representatives who do not fully represent community make-up and interests) are being consulted on technology choice. | 25 |
| Most technologies have been approved by DWASA in consideration of affordability, acceptability and gender issues. A limited number of users/community members (suitable and qualified community representatives) are being consulted on technology choice. | 50 |
| Not all technologies have been approved by DWASA in consideration of affordability, acceptability and gender issues. Future users are being consulted on technology choice. | 75 |
| Technologies have been approved by DWASA in consideration of affordability, acceptability and gender issues. Future users are being consulted on technology choice. | 100 |
| Score given | |
| Justification of score given: | |

Trigger questions:

A. Are there nationally or locally accepted technologies and standards for the components of systems for the provision of LIC water services?
B. Are the supply chains for the delivery, operation and maintenance of the technical components in place and can they be relied upon to safeguard continued system operation?
C. Are LIC consumers aware of the various delivery models in terms of technology, level of service and their expected contribution to the establishment and operation of each of these systems?
D. Do LIC consumers have a say in the choice of the model/ technology for the provision of water services in their LIC?

## 2. Financing for full life-cycle costs

**Summary of scores**

| | 0 | 20 | 40 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|
| Financial planning to cover all life-cycle costs | | | | | | |
| Asset management | | | | | | |

### 2.1 Financial planning to cover all life-cycle costs

| | Score |
|---|---|
| Operational expenditure was not assessed; the cost items have not been identified or sized, let alone agreed or allocated to stakeholders; not one of the stakeholders is actually making payments | 0 |
| Operational expenditure is not assessed; the cost items are arranged on an arbitrary basis and allocated to stakeholder; most stakeholders are not making committed payments | 25 |
| Operational expenditure is not assessed on a regular basis; the cost items have not been identified or sized with formal documentation; stakeholders are partially making their committed payments or some stakeholders (not all) are making their committed payments | 50 |
| Operational expenditure is assessed regularly and covers most cost heads; most cost items have been identified and allocated to stakeholders; most stakeholders are making their committed contributions | 75 |
| Operational expenditure has been assessed and documented and covers the cost of all regular operations, preventive maintenance, minor capital replacements and depreciation; these costs have been agreed upon, allocated and are actually being paid by the stakeholders | 100 |
| Score given | |
| Justification of score given: | |

Trigger questions:

A. Are there national or local guidelines or standards to estimate LIC system costs including those of continued TA, regular operations, preventive maintenance, minor capital replacements and depreciation?
B. Are there guidelines on the allocation of the various cost items to the different stakeholders?
C. What is the practice of estimating and allocation cost items to stakeholders?
D. Where cost allocation among stakeholders has been agreed, are the agreed contributions actually being paid by the stakeholders?

### 2.2 Asset management

| | Score |
|---|---|
| Assets are not adequately maintained; no capital replacements have been foreseen, nor have their cost and funding source have been agreed; no effective consumer complaint system is in place | 0 |
| There is a small asset management fund but there is high dependence on urgent contributions from stakeholders without which there could be a disruption in service; capital replacements are not planned ahead; consumer complaint systems are in place but not effective | 25 |
| There is an asset management fund for capital expenses but not large enough to cover major capital requirements; capital replacements are not planned ahead; effective consumer complaint systems are in place and effective in most cases | 50 |
| While capital replacements are not planned ahead, there is a sizeable asset management fund for capital expenses; effective consumer complaint systems are in place | 75 |
| Assets are adequately maintained; capital replacements have been foreseen and their cost and funding source have been agreed; effective consumer complaint systems are in place | 100 |
| Score given | |
| Justification of score given: | |

Trigger questions:

A. Is asset management as a concept well understood and are there national or local procedures for asset management of LIC systems?
B. Do the stakeholders responsible for the upkeep of the assets plan and implement regular maintenance to ensure the optimal lifetime of the assets entrusted to them?
C. Are adequate funds available for the upkeep and eventual replacement of assets? Which stakeholders are providing these funds and what proportion or part does each stakeholder contribute to?
D. Is there an effective mechanism to identify and report the malperformance or assets and are these mechanisms able to avoid suboptimal functioning of the LIC systems?

## 3. Planning

**Summary of scores**

| | 0 | 20 | 40 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|
| Scaled up service provision | | | | | | |
| Inclusivity | | | | | | |
| Multiple use systems | | | | | | |

### 3.1 Scaled up service provision

| | Score |
|---|---|
| Plans for full water supply coverage to LICs have neither been developed nor have they been shared with and received support from stakeholders. The percentage of LIC coverage is not being monitored and used as a basis for future planning | 0 |
| There are informal, undocumented plans for full water supply coverage to LICs. The percentage of LIC coverage is not being closely monitored and not used as a basis for future planning | 25 |
| Plans for water supply coverage to LICs in Dhaka have been developed for internal use. The percentage of LIC coverage is being monitored partially and irregularly and not being used for future planning | 50 |
| Plans for water supply coverage to LICs in Dhaka have been developed and shared with stakeholders, but have not received consent. The percentage of LIC coverage is being monitored fully or regularly but not being used for future planning | 75 |
| Plans for full water supply coverage to LICs in Dhaka are developed, shared with and supported by stakeholders. The percentage of LIC coverage is being monitored and used for future planning of LIC services expansion | 100 |
| Score given | |
| Justification of score given: | |

Trigger questions:

A. Are there national or local planning frameworks to prepare, implement and operate water services in (Dhaka's) LIC areas?
B. Does the service authority (DWASA) have a policy and related investment plans to achieve full water supply coverage in the LIC areas under their jurisdiction?
C. Is the access to and the use and management of water services in Dhaka LICs being regularly monitored, and do monitoring results inform the planning of services expansion?
D. Are the various models that are in use
E. for the provision of water services in LICs studied in an effort to learn and improve?

### 3.2 Inclusivity

| | Score |
|---|---|
| The planning process does not include participation by the LIC community; consumers do not participate in any of the following stages: planning, design, implementation, operations, monitoring | 0 |
| The planning process includes limited participation by a segment of the LIC community (very low participation by including women, elderly, disabled, minority and marginalized groups); consumers participate in only 1 or 2 of the following stages: planning, design, implementation, operations, monitoring | 25 |
| The planning process involves the LIC community but has limited participation by disadvantaged groups including women, elderly, disabled, minority and marginalized groups; consumers participate in at least 3 of the following stages: planning, design, implementation, operations, monitoring | 50 |
| The planning process includes adequate representation by all segments (including women, men, children, elderly, disabled, minority and marginalized groups) by the LIC community; consumers participate in at least 4 of the following stages: planning, design, implementation, operations, monitoring | 75 |
| The planning process includes participation by the entire LIC community, including women, men, children, elderly, disabled, minority and marginalized groups; consumers participate in all stages: planning, design, implementation, operations, monitoring | 100 |
| Score given | |
| Justification of score given: | |

Trigger questions:

A. Does the national or local planning process include participation by a wide variety of stakeholders including the end-users in the LIC community?
B. Do the stakeholders participate in all subsequent stages of LIC services provision, i.e. planning, design, implementation, operations? In what way are the end-users (LIC residents) involved in the choice of service level and technology?
C. Does the participation of the LIC community include women, men, children, elderly, disabled, minority and marginalized groups?

### 3.3 Multiple water needs and sources

| | Score |
|---|---|
| The planning process simply adopts a standard water demand per capita and does not consider the actual water needs by consumers in LICs, nor does it specifically address public health considerations or awareness raising on safe water collection, storage and use. | 0 |
| The planning process adopts a standard water demand per capita and, albeit to a limited extent only, addresses public health considerations. | 25 |
| The planning process adopts a standard water demand per capita; it specifically addresses public health considerations | 50 |
| The planning process adopts a standard water demand per capita; it specifically addresses public health considerations and includes awareness raising of safe water collection, storage and use. | 75 |
| The planning process adopts a standard water demand per capita but makes adjustments if actual water needs by consumers in LICs are different, it specifically addresses public health considerations and includes awareness raising of safe water collection, storage and use. | 100 |
| Score given | |
| Justification of score given: | |

Trigger questions:

A. For what purposes is water used in the LICs?
B. Do LIC residents use multiple water sources (piped water, bottled water, rainwater, ponds, etc..) and what is each source used for and why (drinking, handwashing,

personal hygiene, anal cleansing, cooking, washing dishes, laundry, house and street cleaning, gardening, etc.)?

C. Does the planning process for LIC water services include all water needs by consumers in LICs? If not, which uses are not taken up in the planning process and, in doing so, are public health issues adequately addressed?
D. Is awareness raising among the LIC residents on the prevention of water-related diseases part of the LIC project intervention? And how about instructions on the safe collection, storage and use of water?

## 4. Transparency and accountability

**Summary of scores**

| | 0 | 20 | 40 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|
| Monitoring for services delivery | | | | | | |
| Service delivery models | | | | | | |
| Accountability and civil society | | | | | | |
| Corruption | | | | | | |

### 4.1 Monitoring for services delivery

| | Score |
|---|---|
| Service level, service providers and service authorities are not monitored against benchmarks, and there is no legislation, regulation or contracts to enable corrective action; there is no evidence of any corrective action in the case of inadequate services | 0 |
| Service level, service providers and service authorities are monitored on an ad-hoc basis, and there is no legislation, regulation or contracts to enable corrective action; there is very little evidence of any corrective action in the case of inadequate services | 25 |
| Service level, service providers and service authorities are monitored irregularly against benchmarks, and there is limited scope for corrective action; there is very little evidence of any corrective action in the case of inadequate services | 50 |
| Service level, service providers and service authorities are monitored regularly against benchmarks, and there are potential legislation, regulation or contracts to enable corrective action; however, proven corrective action has not yet been taken in the case of inadequate services | 75 |
| Service level, service providers and service authorities are monitored against benchmarks, and if needed, legislation, regulation or contracts enable corrective action; there is proof of such actions being implemented successfully | 100 |
| Score given | |
| Justification of score given: | |

Trigger questions:

A. Are there national or local standards or benchmarks for water services provision in LICs covering a.o. maximum distance to a waterpoint, quality and quantity of water and continuity of supply (24/7)?
B. Is there an (independent) national or local monitoring system that regularly collects and analyses data on the functionality of LIC water systems, the water services providers and the service authority (DWASA)?
C. Are the data and the analyses shared between all stakeholders?
D. Is there a system in place that provides the effective follow up on the findings of monitoring system? Is there evidence of effective follow-up?

### 4.2 Accountability and civil society

| | Score |
|---|---|
| Information on the functionality of LIC water services is not collected or analyzed; complaint mechanisms are not in place | 0 |
| Information on the functionality of LIC water services is not collected or analyzed; complaint mechanisms are in place but function only to address a limited number of issues | 25 |
| Information on the functionality of LIC water services is collected but not made available to the community; complaint mechanisms are in place only to address some but not all issues | 50 |
| Information on the functionality of LIC water services is made available only to certain segments of the community; complaint mechanisms are in place and function to the satisfaction of all stakeholders and deal with most issues | 75 |
| Information on the functionality of LIC water services is made available to consumers in LICs; complaint mechanisms are in place and function to the satisfaction of all stakeholders | 100 |
| Score given | |
| Justification of score given: | |

Trigger questions:

A. Are the roles and responsibilities of each stakeholder (consumer, service provider, service authority) in LIC water services development and operation known and accepted?
B. Are complaint mechanisms in place for the end-users (LIC population)? Who is dealing with the complaints and are complaints followed up?
C. Are water operators held accountable in case of malfunctioning of the LIC water services system? What sanctions are at the disposal of the water authority and have they been used?
D. Are the LIC residents informed about the quality of LIC water services delivery?

### 4.3 Corruption

| | Score |
|---|---|
| Administrative processes including procurement are not open to scrutiny by other stakeholders; complaint mechanisms are not in place and complaints discouraged | 0 |
| Administrative processes including procurement are not open to scrutiny by other stakeholders; informal complaint mechanisms are in place with limited functioning | 25 |
| Administrative processes including procurement are partially transparent and in line with national and/or local regulation; not all stakeholders have full access to relevant information upon request; informal complaint mechanisms are in place and function satisfactorily in the case of most issues | 50 |
| Administrative processes including procurement are open and transparent for most stakeholders and in line with national and/or local regulation; a formal complaint mechanism is in place and functions satisfactorily | 75 |
| Administrative processes including procurement are open and transparent and in line with national and/or local regulation; stakeholders have full access to relevant information upon request; formal complaint mechanisms are in place and function satisfactorily | 100 |
| Score given | |
| Justification of score given: | |

Trigger questions:

A. Are channels available to all stakeholders for making complaints about mismanagement of the LIC water system?
B. Is there regular administrative and financial reporting and are these reports accessible to all?

C. Is the procurement of goods and services by the water operators open and transparent?

## 5. Capacity

**Summary of scores**

| | 0 | 20 | 40 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|
| Post construction or recurrent direct support | | | | | | |
| Capacity support to the service authority (DWASA) | | | | | | |

### 5.1 Capacity support to the water services providers

| | Score |
|---|---|
| Service providers have no access to a well-structured, adequately financed capacity support systems in areas of management, technology, administration and O&M of the water system | 0 |
| The capacity needs of service providers are not assessed, capacity support is provided only for certain areas covering management, technology, administration and O&M of the water system, and the frequency and depth of capacity support is greatly restricted by limited funding resources | 25 |
| The capacity needs of service providers are assessed irregularly, capacity support is provided only for certain areas covering management, technology, administration and O&M of the water system, and the frequency of capacity support is greatly restricted by limited funding resources | 50 |
| The capacity needs of service providers are regularly assessed and they have access to a capable, well-structured and moderately financed support system in most of the following areas of management, technology, administration and O&M of the water system | 75 |
| The capacity needs of service providers are regularly assessed and they have access to a customized, well-structured and adequately financed support system in areas including management, technology, administration and O&M of the water system | 100 |
| Score given | |
| Justification of score given: | |

Trigger questions:

A. Is information on the performance of water services providers collected and analyzed to find capacity gaps that hinder proper services delivery? Are there apparent capacity gaps?
B. Are actors available, able and in place to develop and support the capacity of any type of LIC water services provider?
C. Are the assignments for providing capacity development support clear? Are there guidelines or agreements on frequency, type and level of support?
D. Is there adequate and dedicated funding available for post-construction capacity support to water services providers?

### 5.2 Capacity support to the service authority (DWASA)

| | Score |
|---|---|
| The service authority (DWASA) has no access to a well-structured and financed support system | 0 |
| The service authority (DWASA) has access to an inadequate finance support system covering asset management, procurement, contracting aspects to a limited extent, which is not well-structured | 25 |
| The service authority (DWASA) has access to a partially-financed support system covering asset management, procurement, contracting aspects partially and is not well-structured | 50 |
| The service authority (DWASA) can access a mostly well-structured, moderately financed support system covering most of asset management, procurement, contracting aspects | 75 |

| | |
|---|---|
| The service authority (DWASA) can access a well-structured, adequately financed support system covering all aspects of asset management, procurement, contracting | 100 |
| Score given | |
| Justification of score given: | |

Trigger questions:

A. Is information on the performance of water authority (DWASA) in the area of LIC water services provision collected and analyzed to find capacity gaps that hinder DWASA in fulfilling its role to achieve full LIC coverage and adequacy of LIC services delivery? Are there apparent capacity gaps?
B. Are actors available, able and in place to develop and support the capacity of DWASA in advancing the cause of LIC water services provision?
C. Are the assignments for providing capacity development support clear? Are there guidelines or agreements on frequency, type and level of support?
D. Is there adequate and dedicated funding available for capacity development of DWASA in the area of LIC water services provision?

## 6. Learning and knowledge management

**Summary of scores**

| | 0 | 20 | 40 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|
| Sector learning and knowledge management | | | | | | |

### 6.1 Learning and knowledge management

| | Score |
|---|---|
| There is no learning and exchange system in place for the key stakeholders in LIC water services planning, implementation and provision | 0 |
| There is ad-hoc and highly irregular exchange between key stakeholders in LIC water services planning, implementation and provision; sessions adopt a single modality to accommodate funding limitations and are not considered effective | 25 |
| There is irregular learning and exchange between key stakeholders in LIC water services planning, implementation and provision; sessions adopt a single modality to accommodate funding limitations; considered partially effective | 50 |
| There is regular and moderately funded learning and exchange between key stakeholders in LIC water services planning, implementation and provision; this includes multiple modalities covering a combination of consultation, reflection, analysis, information exchange and research and are considered mostly effective | 75 |
| There is regular and adequately funded learning and exchange between key stakeholders in LIC water services planning, implementation and provision; this includes highly effective consultation, reflection, analysis, information exchange and research | 100 |
| Score given | |
| Justification of score given: | |

Trigger questions:

A. Are knowledge, skills and experiences on LIC water services planning, implementation and operation shared between stakeholders? Which stakeholders are involved in this?
B. Is there a formal mechanism in support of learning in the area of LIC water services? Is it active? Is it financially supported and if so, by whom?
C. Which of the following methods are used to promote learning on LIC water services provision: access to information, consultation, reflection, analysis, information exchange, research, training?

## 7. Harmonization and alignment

**Summary of scores**

| | 0 | 20 | 40 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|
| Harmonization and alignment | | | | | | |
| Collaboration and coordination | | | | | | |

### 7.1 Harmonization and alignment

| | Score |
|---|---|
| There is no uniform approach to water services provision in LICs; the different approaches are stand-alone and uncoordinated; participation by stakeholders is limited, is not representative and does not include all groups; there is no coordinated mechanism for mobilizing support by development partners | 0 |
| There are numerous approaches to water services provision in LICs; the different approaches are stand-alone and uncoordinated; participation by stakeholders varies but is suboptimal; there is a mechanism for mobilizing support but it is highly dispersed | 25 |
| There are several approaches to water services provision in LICs; depending on the approach, participation by local stakeholders varies; there is a coordinated mechanism for mobilizing support by development partners but siloed along the preferred approach/model types | 50 |
| There is a handful of uniform and well-defined approaches to water services provision in LICs; although siloed, all approaches have in common that all local stakeholders actively participate; there is a well-coordinated mechanism for mobilizing support by development partners but it is also siloed by approach/model type | 75 |
| There is a uniform approach to water services provision in LICs; this approach was contributed to and agreed by all local stakeholders; there is a well-coordinated mechanism with clear roles and responsibilities for mobilizing support by development partners along a single aligned strategy | 100 |
| Score given | |
| Justification of score given: | |

Trigger questions:

A. Is there a uniform, national or local approach to water services provision in LICs?
B. Have stakeholders participated or played a major role in the development of approaches for water services provision in LICs, and if so, which stakeholder(s) in particular? Is there a leading stakeholder in this field, be it in the formal or informal sense?
C. Does the water authority (DWASA) support one particular approach/model above the others, and if so, why?
D. Is there is a coordinated mechanism for mobilizing external financial and technical support for LIC water services provision?

### 7.2 Collaboration and coordination

| | Score |
|---|---|
| There is no mechanism for regular, structured information sharing involving all local stakeholders and development partners | 0 |
| Information sharing is LIC/project/stakeholder-specific and involves only a closed group of LIC/project stakeholders, and done on an ad-hoc basis | 25 |
| Information sharing is model or approach-specific and involving only the stakeholders and development partners relevant to that approach/model, and done on a regular basis | 50 |
| Information sharing is done on regular basis model involving most wider WASH stakeholders and development partners, and is considered moderately effective | 75 |
| There is a well-coordinated mechanism for regular, structured information sharing involving all local stakeholders and development partners, which is considered highly effective | 100 |

| | |
|---|---|
| Score given | |
| Justification of score given: | |

Trigger questions:
A. Is there collaboration and coordination between all stakeholders in this sector? Which stakeholders takes on this role?
B. Is there a mechanism for regular, structured information sharing that is participated in by all local stakeholders and development partners?
C. Have groups of stakeholders (e.g. the water services providers, or the NGOs, or the development partners) set up mechanisms for collaboration and coordination to achieve economies of scale

## 8. Environment

**Summary of scores**

| | 0 | 20 | 40 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|
| Environment | | | | | | |

### 8.1 Environment

| | Score |
|---|---|
| Environmental and social impact assessments are not part of any project for water services provision in LICs; remedial and corrective measures are neither initiated nor implemented | 0 |
| Environmental and social impact assessments are informally done; remedial and corrective measures, if performed, are arbitrarily chosen and not documented | 25 |
| Environmental and social impact assessments are done formally but mostly for documentation; remedial and corrective measures, if performed, are only done for a limited number of issues identified | 50 |
| Formal environmental and social impact assessments are part of all projects for water services provision in LICs; most identified issues for remedial and corrective measures are generally approved and implemented although limited by inadequate funding allocation | 75 |
| Formal environmental and social impact assessments are part of all projects for water services provision in LICs; all identified requirements for remedial and corrective measures are adequately funded and being implemented | 100 |
| Score given | |
| Justification of score given: | |

Trigger questions:
A. Is there regulation for carrying out environmental and social impact assessment, as part of any project for water services provision in LICs
B. Is an environmental impact assessment a mandatory part of any project for water services provision in LICs?
C. Is a social impact assessment a mandatory part of any project for water services provision in LICs?
D. Do the assessments identify requirements for remedial and corrective measures to address negative impacts, and are these remedial actions adequately funded and being implemented?

## 9. Quality of service

**Summary of scores**

| | 0 | 20 | 40 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|
| Water quality and quantity | | | | | | |
| Continuous and equitable services delivery | | | | | | |
| Acceptability and affordability | | | | | | |
| Supply interruptions | | | | | | |

### 9.1 Water quality and quality

| | Score |
|---|---|
| The water provided in the LIC is always obscure, has a bad smell and taste and is not used for drinking or any other purposes; the water is not available in the required quantity. | 0 |
| The water provided in the LIC is visually clear, however, sometimes smells bad and does not taste well. It is not used for drinking, but used primarily for household purposes; the water is yet to be available in the sufficient quantity. | 25 |
| The water provided in the LIC is considerably clear, mostly odorless, and somewhat tastes well. It is mostly used for household chores and used for drinking after boiling or other form of treatment; the water is available in the sufficient quantity but needs to be stored | 50 |
| The water provided in the LIC is mostly clear, odorless, tastes good and is used for drinking and other purposes; the water is generally available in the required quantity | 75 |
| The water provided in the LIC is always clear, odorless, tastes well and is used for drinking and other purposes; the water is always available in the required quantity | 100 |
| Score given | |
| Justification of score given: | |

Trigger questions:

A. Is the water provided by the concerned LIC model clear and odorless and does it taste well?
B. Is the water available from the LIC system used for drinking? And/or for which other purposes is it used?
C. Is the water supply from the LIC system available in sufficient quantity to meet the requirements by the end-users?

### 9.2 Continuous and equitable service delivery

| | Score |
|---|---|
| The water provided in the LIC is not available throughout the day (24/7) and is not available in equal measure to all LIC residents; for this reason, consumers make use of other sources of supply | 0 |
| The water provided in the LIC is available throughout some hours of the day (few hours a day) however, it is not available in equal measure to all LIC residents; for this reason, most consumers make use other sources of supply | 25 |
| The water provided in the LIC is yet to be available throughout the day and is not accessible in equitable manner to most segments of LIC residents; for this reason, some consumers need to use other sources of supply | 50 |
| The water provided in the LIC is available mostly throughout the day and is mostly available in equal measure with little discrimination to all LIC residents; for this reason, consumers hardly need to use other sources of supply | 75 |
| The water provided in the LIC is available throughout the day (24/7) and is available in equal measure to all LIC residents; for this reason, consumers do not need to use other sources of supply | 100 |
| Score given | |
| Justification of score given: | |

Trigger questions:

A. Is the water provided in the LIC available throughout the day (24/7)?
B. Is the water available/accessible in equal measure to all LIC residents?
C. In case of limited supply hours, do consumers revert to other sources of supply, and if so, which one(s) and for what use?

### 9.3 Acceptability and Affordability

| | Score |
|---|---|
| The water supply system provided to the LIC residents is not acceptable to them and the residents cannot afford the related charges | 0 |
| The water supply system provided to the LIC residents is not fully acceptable to them given alternative sources. In addition, the large majority cannot afford the related charges | 25 |
| The acceptability of the water supply system provided to the LIC residents is on par with other alternative sources. Approximately half of the residents under coverage can afford the related charges | 50 |
| The water supply system provided to the LIC residents is acceptable compared to other alternative sources and the vast majority can afford the related charges | 75 |
| The water supply system provided to the LIC residents is highly preferred and acceptable to all them, and all of them can afford the related charges | 100 |
| Score given | |
| Justification of score given: | |

Trigger questions:

A. Is the water supply system in the LIC acceptable to the LIC residents? Can the system be safely accessed and used throughout the day?
B. Does the actual quality of water services in the LIC justify the charges that the LIC residents need to pay?
C. Can the LIC residents afford the related charges for water use?
D. Can the LIC residents afford the related charges for the maintenance fund?

### 9.4 Supply interruptions

| | Score |
|---|---|
| In case of a supply interruption, the water provider is unable to provide water from an alternative source; repairs usually take longer than 24 hours. If the supply interruption is caused by events outside the LIC, the water authority (DWASA) does not provide water from another source to the LIC; services are generally down for more than 24 hours | 0 |
| In case of a supply interruption, the water provider is often unable to provide water from an alternative source; repairs are generally not completed within 24 hours. If the supply interruption is caused by events outside the LIC, the water authority (DWASA) mostly does not provide water from another source to the LIC; services are generally down for about 24 hours | 25 |
| In case of a supply interruption lasting more than 12 hours, the water provider sometimes steps in and provides water from another source; repairs are mostly completed within 24 hours. If the supply interruption is caused by events outside the LIC, the water authority (DWASA) sometimes steps in and provides water from another source to the LIC; services are often resumed within 24 hours | 50 |
| In case of a supply interruption lasting more than a few hours, either the water provider or DWASA steps in and provides water from another source; repairs are generally completed within 24 hours. Services are mostly resumed within 24 hours | 75 |
| In case of a supply interruption lasting more than a few hours, the water provider always steps in and provides water from another source; repairs are always completed within 24 hours. If the supply interruption is caused by events outside the LIC, the water authority (DWASA) steps in and provides water from another source to the LIC; services are resumed within 24 hours | 100 |
| Score given | |
| Justification of score given: | |

Trigger questions:

A. Do supply interruptions lasting more than a few hours occur and if so, do they occur frequently and do you find this acceptable?
B. In the case that a longer supply interruption is caused by a problem inside the LIC, does the water provider provide water from another source? Are repairs generally completed within 24 hours?
C. In the case that a longer supply interruption is caused by a problem outside the LIC, does DWASA provide water from another source? Are repairs generally completed within 24 hours?

## *Annex 3 – Listing of LICs*

### *Annex 3.1 List of LICs received from DWASA*

Zone and Slum wise A/C no, House Holds and Population

| SL# | Main slum # | Main slum | Small slum | Small slum | MODS zone |
|---|---|---|---|---|---|
| 1 | 1 | BANGALDESH BANK COLONY | 1 | WATER POINT M.C I.G GATE | 1 |
| 2 | 2 | SUVASH BOSH AVENUE | 2 | SUVASH BOSH AVENUE | 1 |
| 3 | 3 | Dhalpur Pura Basti | 3 | MODDHO BOSTI,14 NO. OUT FALL, DHALPUR, | 1 |
| 4 | | | 4 | PORA BOSTHI (P.S.T.C) | 1 |
| 5 | | | 5 | AUTFALL PORA BOSTI | 1 |
| 6 | | | 6 | PORA BOSTI ,CBO | 1 |
| 7 | | | 7 | PORA BOSTI, WEST CDC | 1 |
| 8 | | | 8 | PORABOSTI,CDC | 1 |
| 9 | | | 9 | PORABOSTI, EAST CDC | 1 |
| 10 | 4 | Dhalpur OUTFAL | 10 | 38 GHOR BASPOTTI | 1 |
| 11 | | | 11 | SCHOOL & COMMUNITY DEVELOPMENT | 1 |
| 12 | | | 12 | WATER POINT M.C I.G GATE BOSTI | 1 |
| 13 | | | 13 | MANNANER BOSTI | 1 |
| 14 | | | 14 | CDC OUT FAL Basti | 1 |
| 15 | | | 15 | NOBUR BOSTI, OUT FAL | 1 |
| 16 | | | 16 | ADRASHA BOSTI, OUTFALL | 1 |
| 17 | | | 17 | 96 GHAR BOSTI, OUTFALL | 1 |
| 18 | | | 18 | AYNAL-CDC | 1 |
| 19 | | | 19 | POWAR HOUSE | 1 |
| 20 | | | 20 | MODHER PARA BOSTI AUTFUL | 1 |
| 21 | 5 | CITY POLLI BOSTI | 21 | CITY POLLI BOSTI-A | 1 |
| 22 | | | 22 | CITY POLLI BOSTI-B | 1 |
| 23 | | | 23 | CITY POLLI BOSTI-C | 1 |
| 24 | | | 24 | BASHPOTTY BOSTI | 1 |
| 25 | 6 | DAKHIN GAON BOSTI | 25 | DASPARA BOSTI | 1 |
| 26 | | | 26 | MONDOL PARA | 1 |
| 27 | | | 27 | KUSUMBAG | 1 |
| 28 | 7 | RAZAR BAG | 28 | KALIBARI BOSTI | 1 |
| 29 | | | 29 | RABIDASH PARA WASH 4 URBAN POOR- 1 | 1 |
| 30 | | | 30 | RABIDASH PARA WASH 4 URBAN POOR- 2 | 1 |

| SL# | Main slum # | Main slum | Small slum | Small slum | MODS zone |
|---|---|---|---|---|---|
| 31 | 8 | RABIDASH PARA | 31 | SUTRAPUR Basti-A | 1 |
| 32 | | | 32 | SUTRAPUR BASTI-B | 1 |
| 33 | | | 33 | HEAR STREET BASTI-1 | 1 |
| 34 | | | 34 | HEAR STREET BASTI-2 | 1 |
| 35 | 9 | BANK COLONY BOSTI | 35 | I.G.GATE | 1 |
| 36 | 10 | RAIL GODOWN BOSTI | 36 | RAIL GODOWN BOSTI-1 | 1 |
| 37 | | | 37 | RAIL GODOWN BOSTI-2 | 1 |
| 38 | | | 38 | RAIL GODOWN BOSTI-3 | 1 |
| 39 | | | 39 | RAIL GODOWN BOSTI-4 | 1 |
| 40 | | | 40 | RAIL GODOWN BOSTI-5 | 1 |
| 41 | 11 | WEST JURAIN BASTI | 41 | WEST JURAIN BASTI SHAMPUR | 1 |
| 42 | | | 42 | MANU JAMIDAR BIDDA | 1 |
| 43 | | | 43 | GUNTI GOR RAIL LINE BUSTI | 1 |
| 44 | | | 44 | WEST JURAIN-A | 1 |
| 45 | | | 45 | WEST JURAIN-B | 1 |
| 46 | 12 | MIR HAZIR BAG | 46 | MIR HAZIR BAG-1 | 1 |
| 47 | | | 47 | MIR HAZIR BAG-2 | 1 |
| 48 | | | 48 | MIR HAZIR BAG-3 | 1 |
| 49 | 13 | KARIMULLAR BAGH | 49 | MOHAMMED MUSLIM BASTI | 1 |
| 50 | 14 | T.T. PARA BOSTI | 50 | GOPIBAGH BASTI | 1 |
| | | | | | |
| 1 | 15 | RAYER BAZ | 51 | ZAKIRERBOSTI | 3 |
| 2 | | | 52 | AZAHARER BOSTI | 3 |
| 3 | | | 53 | PABNA HOUSEGOLI | 3 |
| 4 | | | 54 | JAKIRAR BARI | 3 |
| 5 | | | 55 | NAGRAR BOSTI | 3 |
| 6 | | | 56 | SULTANGONJ | 3 |
| 7 | | | 57 | MOHAMMADPUR | 3 |
| 8 | 16 | SHER E BANGLA NAGAR | 58 | TELEGU SUIPER COLONY | 3 |
| 9 | 17 | JAFRABAD | 59 | SOYADALIR BOSTI | 3 |
| 10 | | | 60 | MASTERAR BOSTI | 3 |
| 11 | | | 61 | AZIZ KHAN ROAD | 3 |
| 12 | | | 62 | AGARGAW GONOPURTO SUIPER | 3 |

| SL# | Main slum # | Main slum | Small slum | Small slum | MODS zone |
|---|---|---|---|---|---|
| 13 | 18 | AGARGAON | 63 | PRESIDENT PWD SWEPER COLONY | 3 |
| 14 | | | 64 | P.W.D. SWEEPER COLONY-02 | 3 |
| | | | | | |
| 1 | 19 | DUARIPARA Slum, Mirpur | 65 | DUARIPARA, BLOCK-KA | 4 |
| 2 | | | 66 | DUARIPARA BLOCK-KA (Road-1)bosti | 4 |
| 3 | | | 67 | DUARIPARA BLOCK-KA (Road-2)bosti | 4 |
| 4 | | | 68 | DUARIPARA BLOCK-KA (Road-3)bosti | 4 |
| 5 | | | 69 | DUARIPARA BLOCK-KA (Road-4)bosti | 4 |
| 6 | | | 70 | DUARIPARA, BLOCK-KHA | 4 |
| 7 | | | 71 | DUARIPARA, BLOCK-GA | 4 |
| 8 | | | 72 | DUARIPARA, BLOCK-GHA | 4 |
| 9 | | | 73 | DUARIPARA, SEC-8 | 4 |
| 10 | | | 74 | DUARIPARA, N.H-NORTH SIDE | 4 |
| 11 | | | 75 | DUARIPARA, ANOBIK SHAKTI | 4 |
| 12 | | | 76 | DUARIPARA BAZAR | 4 |
| 13 | | | 77 | FAYZUN NESSA WAQF ESTATE | 4 |
| 14 | | | 78 | MOLLAH PARA | 4 |
| 15 | | | 79 | SARONIKA | 4 |
| 16 | | | 80 | PURNORBASN | 4 |
| 17 | | | 81 | BHOLA BAHUMUKHI | 4 |
| 18 | | | 82 | ATOM POWER | 4 |
| 19 | | | 83 | RUPNAGAR | 4 |
| 20 | | | 84 | NORTH PUMP HOUSE | 4 |
| 21 | | | 85 | AVENUE | 4 |
| 22 | | | 86 | HOUSING | 4 |
| 23 | | | 87 | DUARIPARA unnamed slum | 4 |
| 24 | | | 88 | Duaripara-6 # WORD | 4 |
| 25 | | | 89 | EAST DOYARIPARA BOSTI | 4 |
| 26 | | | 90 | VOLAR BOSTI | 4 |
| 27 | | | 91 | LAL MIAH, NEAR-22 | 4 |
| 28 | | | 92 | DSK-WASH 4 URBAN POOR | 4 |
| 29 | 20 | CITY COLONY | 93 | CITY COLONY -01 | 4 |
| 30 | | | 94 | CITY COLONY -02 | 4 |
| 31 | | | 95 | CITY COLONY -03 | 4 |
| 32 | | | 96 | CITY COLONY -04 | 4 |
| 33 | | | 97 | CITY COLONY -05 | 4 |
| 34 | 21 | BUDDIJIBI KABORSTHAN | 98 | BUDDIJIBI KABORSTHAN - 01 | 4 |
| 35 | | | 99 | BUDDIJIBI KABORSTHAN - 02 | 4 |
| 36 | | | 100 | BUDDIJIBI KABORSTHAN - 03 | 4 |
| 37 | | | 101 | PURA BOSTI-1 | 4 |
| 38 | | | 102 | PURA BOSTI-2 | 4 |
| 39 | | | 103 | PURA BOSTI-3 | 4 |
| 40 | | | 104 | PURA BOSTI-4 | 4 |

| SL# | Main slum # | Main slum | Small slum | Small slum | MODS zone |
|---|---|---|---|---|---|
| 41 | 22 | KALLAYNPUR | 105 | PURA BOSTI-5 | 4 |
| 42 | | | 106 | PURA BOSTI-6 | 4 |
| 43 | | | 107 | PURA BOSTI-7 | 4 |
| 44 | | | 108 | PURA BOSTI-8 | 4 |
| 45 | | | 109 | PURA BOSTI-9 | 4 |
| 46 | | | 110 | OTHERS | 4 |
| 47 | | | 111 | BHUTTOR GOLI | 4 |
| 48 | | | 112 | BELTALA BOSTI-8 | 4 |
| 49 | | | 113 | BELTALA BOSTI-9 | 4 |
| 50 | 23 | NAGRA MATOBOR BOSTI | 114 | # 03 road Bosti | 4 |
| 51 | 24 | MUKTIZUDDAH COMPLEX | 115 | MUKTIZUDDAH COMPLEX NORTH-1 | 4 |
| 52 | | | 116 | MUKTIZUDDAH COMPLEX NORTH-2 | 4 |
| 53 | | | 117 | MUKTIZUDDAH COMPLEX NORTH-3 | 4 |
| 54 | | | 118 | MUKTIZUDDAH COMPLEX SOUTH-1 | 4 |
| 55 | | | 119 | MUKTIZUDDAH COMPLEX SOUTH-2 | 4 |
| 56 | | | 120 | MUKTIZUDDAH COMPLEX SOUTH-3 | 4 |
| 57 | | | 121 | MUKTIZUDDAH COMPLEX--01 | 4 |
| 58 | | | 122 | MUKTIZUDDAH COMPLEX--02 | 4 |
| 59 | | | 123 | MUKTIZUDDAH COMPLEX--03 | 4 |
| 60 | | | 124 | MUKTIZUDDAH COMPLEX--04 | 4 |
| 61 | | | 125 | MUKTIZUDDAH COMPLEX--05 | 4 |
| 62 | | | 126 | MUKTIZUDDAH COMPLEX--06 | 4 |
| 63 | | | 127 | MUKTIZUDDAH COMPLEX--07 | 4 |
| 64 | | | 128 | MUKTIZUDDAH COMPLEX--08 | 4 |
| 65 | | | 129 | MUKTIZUDDAH COMPLEX--09 | 4 |
| 66 | | | 130 | MUKTIZUDDAH COMPLEX--10 | 4 |
| 67 | | | 131 | MUKTIZUDDAH COMPLEX--11 | 4 |
| 68 | | | 132 | MUKTIZUDDAH COMPLEX--12 | 4 |
| 69 | | | 133 | MUKTIZUDDAH COMPLEX--13 | 4 |
| 70 | | | 134 | MUKTIZUDDAH COMPLEX--14 | 4 |
| 71 | | | 135 | MUKTIZUDDAH COMPLEX--15 | 4 |
| 72 | | | 136 | MUKTIZUDDAH COMPLEX--16 | 4 |
| 73 | | | 137 | MUKTIZUDDAH COMPLEX--17 | 4 |
| 74 | | | 138 | MUKTIZUDDAH COMPLEX--18 | 4 |
| 75 | | | 139 | BLOCK-KA-1 | 4 |
| 76 | | | 140 | BLOCK-KA-2 | 4 |
| 77 | | | 141 | BLOCK-KA-3 | 4 |
| 78 | | | 142 | BLOCK-KHA | 4 |
| 79 | | | 143 | BLOCK-KA-5 | 4 |
| 80 | | | 144 | SEC-07, | 4 |
| 81 | | | 145 | SEC-06, | 4 |
| 82 | | | 146 | SEC-06, BLOCK-TA, ROAD-38, | 4 |
| 83 | | | 147 | HEAD OF 38 NO ROAD | 4 |
| 84 | | | 148 | BLOCK-KA | 4 |
| 85 | | | 149 | BLOCK-KhA | 4 |
| 86 | | | 150 | BLOCK-GA | 4 |

| SL# | Main slum # | Main slum | Small slum | Small slum | MODS zone |
|---|---|---|---|---|---|
| 87 | 25 | JHILPAR | 151 | BLOCK-T | 4 |
| 88 | | | 152 | ROAD -38, BLOCK-TA | 4 |
| 89 | | | 153 | ROAD -37 | 4 |
| 90 | | | 154 | ROAD -36, SEC-6, | 4 |
| 91 | | | 155 | ROAD -35 | 4 |
| 92 | | | 156 | ROAD -34 | 4 |
| 93 | | | 157 | ROAD -33 | 4 |
| 94 | | | 158 | SEC-6, BLOCK-E | 4 |
| 95 | | | 159 | 6 # WORD | 4 |
| 96 | | | 160 | CHOLONTIKA BLOCK-E | 4 |
| 97 | | | 161 | VOLAR BOSTI | 4 |
| 98 | 26 | RUPNAGAR | 162 | MUKTIJUDDAH BOSTI | 4 |
| 99 | | | 163 | DUARIPARA BLOCK-KA( Road-1)bosti | 4 |
| 100 | | | 164 | 6NO WARD RUPNAGAR SE/A BOSTI | 4 |
| 101 | | | 165 | SEC-7,RUPNAGAR BOSTI, | 4 |
| 102 | 27 | ARAMBAG | 166 | TIN SHED BOSTI | 4 |
| 103 | 28 | KABIR MOLLAH BOSTI | 167 | HARUNABAD PALLABI | 4 |
| 104 | 29 | SARENG BARI BOSTI | 168 | SARENG BARI BOSTI | 4 |
| 105 | 30 | JAMIDAR BARI BOSTI | 169 | MAZAR ROAD | 4 |
| 106 | 31 | GUDARA GHAT, | 170 | LALMAT,BLOCK-H, | 4 |
| 107 | | | 171 | HOUSE-10, ROAD-18, BLOCK-H, | 4 |
| 108 | 32 | PALPARA BOSTI | 172 | BARIBADH,MIRPUR | 4 |
| 109 | | | 173 | ZAHORA KHATUN | 4 |
| 110 | 33 | NORTH BISHIL, | 174 | SAJEDA BEGUM'S,BOSTI | 4 |
| 111 | | | 175 | ROAD-2, | 4 |
| 112 | | | 176 | BABUL MIA BOSTI | 4 |
| 113 | | | 177 | MOBARUK HOSSAN KHAN | 4 |
| 114 | 34 | BISHIL | 178 | R-H-D-S-SARANG BARI, ,MIRPUR | 4 |
| 115 | 35 | Mirpur-06 Slum | 179 | 6/TA, ROAD-38, BOSTI, | 4 |
| 116 | | | 180 | 6 # WARD JHAiLPAR, BOSTI, | 4 |
| 117 | | | 181 | SEC-7,BLOCK-TA,MIRPUR | 4 |
| 118 | | | 182 | ALAKJAN-2 | 4 |
| 119 | | | 183 | CLASTER-2,GONNI / RANA, | 4 |
| 120 | | | 184 | CLASTER-3 (RENA) MIRPUR | 4 |
| 121 | | | 185 | ROAD-36, BLOCK-TA BOSTI, | 4 |
| 122 | 36 | GABTOLI BUS TARMINAL, | 186 | WORKING COMMITEE (DSK), | 4 |
| 123 | 37 | MOLLAH BOSTI, | 187 | JOSHIM | 4 |
| 124 | | | 188 | SULTAN | 4 |
| 125 | | | 189 | HARUNABAD-1 Bosti | 4 |
| 126 | | | 190 | ELEYAS | 4 |
| 127 | | | 191 | SATTAR MOLLAH | 4 |
| 128 | | | 192 | HARUNABAD MOLLAR-2 BOSTI | 4 |
| 129 | 38 | WABDA BOSTI- | 193 | WABDA BOSTI-(254) | 4 |
| 130 | 39 | NAGRA MATOBOR BOSTI- | 194 | BOSTI-1(SALE) | 4 |
| 131 | | | 195 | GILADI, | 4 |
| 132 | | | 196 | NAGRA MATOBOR BOSTI-# 03, | 4 |

| SL# | Main slum # | Main slum | Small slum | Small slum | MODS zone |
|---|---|---|---|---|---|
| | | | | | |
| 1 | 40 | KORAIL BOSTI | 197 | KORAIL BOSTI UNIT-1, BLOCK-A | 5 |
| 2 | | | 198 | KORAIL BOSTI UNIT-1, BLOCK-B | 5 |
| 3 | | | 199 | KORAIL BOSTI UNIT-1, BLOCK-C | 5 |
| 4 | | | 200 | KORAIL BOSTI UNIT-1, BLOCK-D | 5 |
| 5 | | | 201 | KORAIL BOSTI UNIT-2, BLOCK-A | 5 |
| 6 | | | 202 | KORAIL BOSTI UNIT-2, BLOCK-B | 5 |
| 7 | | | 203 | KORAIL BOSTI UNIT-2, BLOCK-C | 5 |
| 8 | | | 204 | KORAIL BOSTI UNIT-2, BLOCK-D | 5 |
| 9 | | | 205 | KORAIL,EASTERN SIDE BOSTI | 5 |
| 10 | | | 206 | KORAIL BOSTI UNIT-3, | 5 |
| 11 | | | 207 | NOOR NAHAR GOLI | 5 |
| 12 | | | 208 | B K LAKE PAR SLUM | 5 |
| 13 | | | 209 | KUMILLA POTTI | 5 |
| 14 | | | 210 | BOU BAZAR | 5 |
| 15 | 41 | SATTALA BOSTI | 211 | STAFF MOHOLLA BOSTI NORTH SIDE | 5 |
| 16 | | | 212 | STAFF MOHOLLA BOSTI SOUTH SIDE | 5 |
| 17 | | | 213 | STAFF BOSTI | 5 |
| 18 | | | 214 | PORABARI BOSTI | 5 |
| 19 | | | 215 | BOUNDARIE BOSTI A BLOCK | 5 |
| 20 | | | 216 | BOUNDARIE BOSTI B BLOCK | 5 |
| 21 | | | 217 | BOUNDARIE BOSTI C BLOCK | 5 |
| 22 | | | 218 | BOUNDARIE BOSTI D BLOCK | 5 |
| 23 | | | 219 | MASTERPARA | 5 |
| 24 | | | 220 | ADORSHONAGAR PORABARI BOSTI | 5 |
| 25 | | | 221 | HINDUPARA EAST SIDE BOSTI | 5 |
| 26 | | | 222 | HINDUPARA WEST SIDE BOSTI | 5 |
| 27 | | | 223 | STAFF MOHOLLA BOSTI EAST SIDE | 5 |
| 28 | | | 224 | STAFF MOHOLLA BOSTI WEST SIDE | 5 |
| 29 | | | 225 | SAT-TOLA BOSTI-5 | 5 |
| 30 | | | 226 | SATTOLA BOSTI-2 | 5 |
| 31 | | | 227 | PORA BOSTI SATTALA CLUSTER-1 | 5 |
| 32 | | | 228 | PORA BOSTI SATTALA CLUSTER-2 | 5 |
| 33 | | | 229 | PORA BOSTI SATTALA CLUSTER-3 | 5 |
| 34 | | | 230 | PORA BOSTI SATTALA CLUSTER-4 | 5 |
| 35 | | | 231 | PORA BOSTI SATTALA CLUSTER-5 | 5 |
| 36 | | | 232 | SATTALA CHOWDORYPARA BOSTI | 5 |
| 37 | | | 233 | SATTALA CHOWDORYPARA BOSTI | 5 |
| 38 | | | 234 | SATTALA CHOWDORYPARA BOSTI | 5 |
| 39 | | | 235 | SATTALA CHOWDORYPARA BOSTI | 5 |
| 40 | | | 236 | SATTALA CHOWDORYPARA BOSTI | 5 |
| 41 | | | 237 | SATTALA CHOWDORYPARA BOSTI | 5 |
| 42 | | | 238 | SATTALA CHOWDORYPARA BOSTI | 5 |
| 43 | | | 239 | T.&T. BOSTHI UNIT-1 A BLOCK | 5 |
| 44 | | | 240 | T.&T. BOSTHI UNIT-1 B BLOCK | 5 |
| 45 | | | 241 | T.&T. BOSTHI UNIT-1 C BLOCK | 5 |

| SL# | Main slum # | Main slum | Small slum | Small slum | MODS zone |
|---|---|---|---|---|---|
| 46 | 42 | T.&T. BOSTHI BANANI | 242 | T.&T. BOSTHI UNIT-2 A BLOCK | 5 |
| 47 | | | 243 | T.&T. BOSTHI UNIT-2 B BLOCK | 5 |
| 48 | | | 244 | T.&T. BOSTHI UNIT-2 C BLOCK | 5 |
| 49 | | | 245 | T.& T COLONEY BOSTHI | 5 |
| 50 | 43 | BHANGA DEWAN BOSTI | 246 | BALTOLA BOSTHI | 5 |
| 51 | | | 247 | BHANGA DEWAN BOSTI EAST SIDE | 5 |
| 52 | | | 248 | BHANGA DEWAN BOSTI WEST SIDE | 5 |
| 53 | | | 249 | BHANGA DEWAN BOSTI NORTH SIDE | 5 |
| 54 | | | 250 | BHANGA DEWAN BOSTI SOUTH SIDE | 5 |
| 55 | | | 251 | 14 CORNER DEPO | 5 |
| 56 | | | 252 | NAKHALPARA RAILWAY | 5 |
| 57 | | | 253 | P.T.C. BOSTI | 5 |
| 58 | 44 | GODOWN BOSTI, BANANI | 254 | GODOWN BOSTI A BLOCK | 5 |
| 59 | | | 255 | GODOWN BOSTI B BLOCK | 5 |
| 60 | 45 | BEDER BOSTI, BANANI | 256 | BEDER BOSTI BLOCK-A | 5 |
| 61 | | | 257 | BEDER BOSTI BLOCK-B | 5 |
| 62 | | | 258 | BEDER BOSTI BLOCK-C | 5 |
| 63 | 46 | SATTELITE BOSTI, BANANI | 259 | EAST SIDE SATTELITE BOSTI | 5 |
| 64 | | | 260 | WEST SIDE SATTELITE BOSTI | 5 |
| 65 | 47 | EARSHAD NAGAR BOSTI, BANANI | 261 | EARSHAD NAGAR BOSTI UNIT -1 | 5 |
| 66 | | | 262 | EARSHAD NAGAR BOSTI UNIT -1 | 5 |
| 67 | | | 263 | EARSHAD NAGAR BOSTI UNIT -1 | 5 |
| 68 | | | 264 | EARSHAD NAGAR BOSTI UNIT -1 | 5 |
| 69 | | | 265 | EARSHAD NAGAR BOSTI UNIT -2 | 5 |
| 70 | | | 266 | EARSHAD NAGAR BOSTI UNIT -2 | 5 |
| 71 | | | 267 | EARSHAD NAGAR BOSTI UNIT -2 | 5 |
| 72 | | | 268 | EARSHAD NAGAR BOSTI UNIT -2 | 5 |
| 73 | | | 269 | EARSHAD NAGAR BOUNDARY BOSTI | 5 |
| | | | | | |
| 1 | 48 | SHAJAHANPUR RAILWAY COLONY BOSTI | 270 | SHAJAHANPUR RAILWAY COLONY | 6 |
| 2 | 49 | MERADIA | 271 | TITAS ROAD, CLUSTER-3, WARD- 3,MERADIA | 6 |
| 3 | | | 272 | HOUSE NO-265, MERADIA | 6 |
| 4 | | | 273 | HOUSE NO-200/3/A, MERADIA | 6 |
| 5 | | | 274 | DAG # 755, N.H. 240, MERADIA | 6 |
| 6 | | | 275 | MERADIA BOSTI, MERADIA | 6 |
| 7 | 50 | KALIMONDIR | 276 | DAG # 955, ROAD # 2, DAKHINGAON, KALI MONDIR ROAD | 6 |
| 8 | 51 | SOUTH GOAN | 277 | DAG # 294, ROAD # 2, SOUTH | 6 |
| 9 | 52 | DHAKINGAON | 278 | DAG # 239, DHAKINGAON MAIN ROAD,DAS PARA | 6 |
| 10 | | | 279 | DAG # 955, ROAD # 2, DHAKIN | 6 |
| 11 | 53 | KHILGAON | 280 | HOUSE NO-1497/2,ROAD NO-24, BLOCK- A,KHILGAON | 6 |
| 12 | 54 | MALEKER BOSTEE | 281 | MALEKER BOSTEE, KHILGAON | 6 |

| SL# | Main slum # | Main slum | Small slum | Small slum | MODS zone |
|---|---|---|---|---|---|
| | | | | | |
| 1 | 55 | EAST JURAIN | 282 | DAG # 1145,N.H. 1908, EAST | 7 |
| | | | | | |
| 1 | 56 | STAFF QUARTER | 283 | NEAR SONALI BANK STAFF QUARTER, | 9 |
| 2 | 57 | SIKDER BARI | 284 | SIKDER BARI, PUBLIBANK STAFF QUTER BOSTI | 9 |
| 3 | | | 285 | SIKDER BARI,UTTARA, SECTOR -08 | 9 |
| 4 | 58 | CLUSTER MONOWARA | 286 | CLUSTER-MONOWARA BEGUM, SEC-8 | 9 |
| 5 | 59 | UTTARA, SECTION-8 | 287 | BOSTI-8, SEC-8,UTTARA | 9 |
| | | | | | |
| 1 | 60 | 14 NO Tin shed Bosti | 288 | 14 NO Tin shed Bosti North | 1 |
| 2 | | | 289 | 14 NO Tin shed Bosti South | 1 |
| 3 | 61 | 3 No Dhamal Kot | 290 | | 1 |
| 4 | 62 | 3 NO WAPDA Camp | 291 | | 1 |
| 5 | 63 | Abuler Bosti | 292 | Abuler Bosti North | 1 |
| 6 | | | 293 | Abuler Bosti South | 1 |
| 7 | 64 | Aniser Bosti | 294 | | 1 |
| 8 | 65 | BATTALA Bosti, KALSHI KALAPANI | 295 | BATTALA Bosti East | 1 |
| 9 | | | 296 | BATTALA Bosti West | 1 |
| 10 | 66 | BALUR GHAT, KALSHI | 297 | BALUR GHAT, KALSHI KURMITOLA | 1 |
| 11 | 67 | BAGANBARI | 298 | BAGANBARI NORTH | 1 |
| 12 | | | 299 | BAGANBARI SOUTH | 1 |
| 13 | | | 300 | BAGANBARI EAST | 1 |
| 14 | | | 301 | BAGANBARI WEST | 1 |
| 15 | 68 | BAISHTEKI | 302 | BAISHTEKI East | 1 |
| 16 | | | 303 | BAISHTEKI West | 1 |
| 17 | | | 304 | BAWNEYABAD A BLOCK NORTH | 1 |
| 18 | | | 305 | BAWNEYABAD A BLOCK SOUTH | 1 |
| 19 | | | 306 | BAWNEYABAD A BLOCK EAST | 1 |
| 20 | | | 307 | BAWNEYABAD A BLOCK WEST | 1 |
| 21 | | | 308 | BAWNEYABAD B BLOCK NORTH | 1 |
| 22 | | | 309 | BAWNEYABAD B BLOCK SOUTH | 1 |
| 23 | | | 310 | BAWNEYABAD B BLOCK EAST | 1 |
| 24 | | | 311 | BAWNEYABAD B BLOCK WEST | 1 |
| 25 | | | 312 | BAWNEYABAD C BLOCK NORTH | 1 |
| 26 | | | 313 | BAWNEYABAD C BLOCK SOUTH | 1 |
| 27 | | | 314 | BAWNEYABAD C BLOCK EAST | 1 |
| 28 | | | 315 | BAWNEYABAD C BLOCK WEST | 1 |
| 29 | | | 316 | BAWNEYABAD D BLOCK NORTH | 1 |
| 30 | | | 317 | BAWNEYABAD D BLOCK SOUTH | 1 |
| 31 | | | 318 | BAWNEYABAD D BLOCK EAST | 1 |
| 32 | | | 319 | BAWNEYABAD D BLOCK WEST | 1 |
| 33 | | | 320 | BAWNEYABAD E BLOCK NORTH | 1 |
| 34 | | | 321 | BAWNEYABAD E BLOCK SOUTH | 1 |
| 35 | | | 322 | BAWNEYABAD E BLOCK EAST | 1 |

| SL# | Main slum # | Main slum | Small slum | Small slum | MODS zone |
|---|---|---|---|---|---|
| 36 | | | 323 | BAWNEYABAD E BLOCK WEST | 1 |
| 37 | | | 324 | BAWNEYABAD E BLOCK PUKURPAR | 1 |
| 38 | | | 325 | BAWNEYABAD E BLOCK KOLABAGAN | 1 |
| 39 | | | 326 | BAWNEYABAD E BLOCK BERIBADH | 1 |
| 40 | | | 327 | Bawniyabad Kolabagan North | 1 |
| 41 | | | 328 | Bawniyabad Kolabagan South | 1 |
| 42 | | | 329 | Bawniyabad Kolabagan East | 1 |
| 43 | | | 330 | Bawniyabad Kolabagan West | 1 |
| 44 | | | 331 | BAWNEYABAD BERIBADH | 1 |
| 45 | | | 332 | BAWNEYABAD PORA BOSTI | 1 |
| 46 | | | 333 | BAWNEYABAD Y BLOCK | 1 |
| 47 | | | 334 | BAWNEYABAD H BLOCK | 1 |
| 48 | | | 335 | BAWNEYABAD PALLABI EAST | 1 |
| 49 | | | 336 | BAWNEYABAD PALLABI WEST | 1 |
| 50 | 70 | BNP ROAD | 337 | BNP ROAD NORTH | 1 |
| 51 | | | 338 | BNP ROAD SOUTH | 1 |
| 52 | 71 | GUDARA GHAT | 339 | | 1 |
| 53 | 72 | HAZI SOBHAN ROAD | 340 | HAZI SOBHAN ROAD NORTH | 1 |
| 54 | | | 341 | HAZI SOBHAN ROAD SOUTH | 1 |
| 55 | 73 | IMAM BARA | 342 | | 1 |
| 56 | 74 | IRANI CAMP | 343 | IRANI CAMP NORTH | 1 |
| 57 | | | 344 | IRANI CAMP SOUTH | 1 |
| 58 | 75 | JUT POTRI | 345 | JUT POTRI UTTAR | 1 |
| 59 | | | 346 | JUT POTRI DAKKHIN | 1 |
| 60 | 76 | KALSHI BALUR MATH | 347 | KALSHI BALUR MATH NORTH | 1 |
| 61 | | | 348 | KALSHI BALUR MATH SOUTH | 1 |
| 62 | | | 349 | KALSHI BALUR MATH EAST | 1 |
| 63 | | | 350 | KALSHI BALUR MATH WEST | 1 |
| 64 | 77 | KALSHI BEGUNTILA | 351 | KALSHI BEGUNTILA UTTAR | 1 |
| 65 | | | 352 | KALSHI BEGUNTILA DAKKHIN | 1 |
| 66 | | | 353 | KALSHI BEGUNTILA PURBO | 1 |
| 67 | | | 354 | KALSHI BEGUNTILA PASCHIM | 1 |
| 68 | 78 | KALSHI CERAMIC | 355 | | 1 |
| 69 | 79 | KALSHI KALAPANI | 356 | KALSHI KALAPANI UTTAR | 1 |
| 70 | | | 357 | KALSHI KALAPANI DAKKHIN | 1 |
| 71 | | | 358 | KALSHI KALAPANI PURBO | 1 |
| 72 | | | 359 | KALSHI KALAPANI PASCHIM | 1 |
| 73 | 80 | KALSHI KOBORSTAN | 360 | KALSHI KOBORSTAN EAST | 1 |
| 74 | | | 361 | KALSHI KOBORSTAN WEST | 1 |
| 75 | 81 | KALSHI KURMITOLA | 362 | KALSHI KURMITOLA UTTAR | 1 |
| 76 | | | 363 | KALSHI KURMITOLA DAKKHIN | 1 |
| 77 | | | 364 | KALSHI KURMITOLA PURBO | 1 |
| 78 | | | 365 | KALSHI KURMITOLA PASCHIM | 1 |
| 79 | | | 366 | KALSHI TEKER BARI NORTH | 1 |
| 80 | | | 367 | KALSHI TEKER BARI SOUTH | 1 |

| SL# | Main slum # | Main slum | Small slum | Small slum | MODS zone |
|---|---|---|---|---|---|
| 81 | | | 368 | KALSHI TEKER BARI EAST | 1 |
| 82 | | | 369 | KALSHI TEKER BARI WEST | 1 |
| 83 | 83 | KARNOSAN CAMP | 370 | | 1 |
| 84 | 84 | LALASHORAI | 371 | LALASHORAI UTTAR | 1 |
| 85 | | | 372 | LALASHORAI DAKKHIN | 1 |
| 86 | | | 373 | LALASHORAI PURBO | 1 |
| 87 | | | 374 | LALASHORAI PASCHIM | 1 |
| 88 | 85 | LALASHORAI KOCHU KHET | 375 | LALASHORAI KOCHU KHET UTTAR | 1 |
| 89 | | | 376 | LALASHORAI KOCHU KHET DAKKHIN | 1 |
| 90 | 86 | LALASHORAI MODDHO PARA | 377 | LALASHORAI MODDHO PARA NORTH | 1 |
| 91 | | | 378 | LALASHORAI MODDHO PARA SOUTH | 1 |
| 92 | | | 379 | LALASHORAI MODDHO PARA EAST | 1 |
| 93 | | | 380 | LALASHORAI MODDHO PARA WEST | 1 |
| 94 | 87 | LALASHORAI TEKPARA | 381 | LALASHORAI TEKPARA UTTAR | 1 |
| 95 | | | 382 | LALASHORAI TEKPARA DAKKHIN | 1 |
| 96 | | | 383 | LALASHORAI TEKPARA PURBO | 1 |
| 97 | | | 384 | LALASHORAI TEKPARA PASCHIM | 1 |
| 98 | 88 | LALASHORAI WEST DHAMALKOT | 385 | LALASHORAI WEST DHAMALKOT UTTAR | 1 |
| 99 | | | 386 | LALASHORAI WEST DHAMALKOT DAKKHIN | 1 |
| 100 | | | 387 | LALASHORAI WEST DHAMALKOT | 1 |
| 101 | | | 388 | LALASHORAI WEST DHAMALKOT PASCHIM | 1 |
| 102 | 89 | LALASHORAI ZAMIDAR BARI | 389 | LALASHORAI ZAMIDAR BARI NORTH | 1 |
| 103 | | | 390 | LALASHORAI ZAMIDAR BARI SOUTH | 1 |
| 104 | | | 391 | LALASHORAI ZAMIDAR BARI EAST | 1 |
| 105 | | | 392 | LALASHORAI ZAMIDAR BARI WEST | 1 |
| 106 | 90 | MAYOR POTTI | 393 | | 1 |
| 107 | 91 | MCC CAMP | 394 | MCC CAMP NORTH | 1 |
| 108 | | | 395 | MCC CAMP SOUTH | 1 |
| 109 | | | 396 | MCC CAMP EAST | 1 |
| 110 | | | 397 | MCC CAMP WEST | 1 |
| 111 | 92 | MEDICAL CAMP | 398 | | 1 |
| 112 | 93 | MILK VITA | 399 | MILK VITA NORTH | 1 |
| 113 | | | 400 | MILK VITA SOUTH | 1 |
| 114 | 94 | MILLAT CAMP | 401 | | 1 |
| 115 | 95 | MORAPARA CAMP | 402 | | 1 |
| 116 | 96 | MUSLIM CAMP | 403 | MUSLIM CAMP NORTH | 1 |
| 117 | | | 404 | MUSLIM CAMP SOUTH | 1 |
| 118 | 97 | PARIS ROAD | 405 | | 1 |
| 119 | 98 | RABEDA CAMP | 406 | RABEDA CAMP EAST | 1 |
| 120 | | | 407 | RABEDA CAMP WEST | 1 |
| 121 | | | 408 | RAHMAT CAMP NORTH | 1 |
| 122 | | | 409 | RAHMAT CAMP SOUTH | 1 |

| SL# | Main slum # | Main slum | Small slum | Small slum | MODS zone |
|---|---|---|---|---|---|
| 123 | | | 410 | RAHMAT CAMP EAST | 1 |
| 124 | | | 411 | RAHMAT CAMP WEST | 1 |
| 125 | 100 | RAJUR BOSTI | 412 | RAJUR BOSTI EAST | 1 |
| 126 | | | 413 | RAJUR BOSTI WEST | 1 |
| 127 | 101 | SONALI CAMP | 414 | | 1 |
| 128 | 102 | TALAB CAMP | 415 | TALAB CAMP EAST | 1 |
| 129 | | | 416 | TALAB CAMP WEST | 1 |
| 130 | 103 | TALTOLA | 417 | TALTOLA NORTH | 1 |
| 131 | | | 418 | TALTOLA SOUTH | 1 |
| 132 | | | 419 | TALTOLA EAST | 1 |
| 133 | | | 420 | TALTOLA WEST | 1 |
| 134 | 104 | THIRTYNUS CAMP | 421 | THIRTYNUS CAMP NORTH | 1 |
| 135 | | | 422 | THIRTYNUS CAMP SOUTH | 1 |
| 136 | | | 423 | THIRTYNUS CAMP EAST | 1 |
| 137 | | | 424 | THIRTYNUS CAMP WEST | 1 |
| 138 | 105 | BESHO BIDDALOY MONJORI COMITIONER | 425 | BESHO BIDDALOY MONJORI COMITIONER | 10 |
| 139 | 106 | BIDDUT COLONIR PASHER BOSTI | 426 | BIDDUT COLONIR PASHER BOSTI | 10 |
| 140 | 107 | PALLABI | 427 | PALLABI NORTH | 1 |
| 141 | | | 428 | PALLABI SOUTH | 1 |
| 142 | | RUPOSHI BANGLA | 429 | RUPOSHI BANGLA | 1 |
| 143 | 108 | UNIVERSITY GRANT | 430 | UNIVERSITY GRANT COMMITION | 10 |
| 144 | 109 | VASHANTEK | 431 | VASHANTEK NORTH | 1 |
| 145 | | | 432 | VASHANTEK SOUTH | 1 |
| 146 | | | 433 | VASHANTEK EAST | 1 |
| 147 | | | 434 | VASHANTEK WEST | 1 |
| 148 | 110 | WAPDA CAMP | 435 | | 1 |
| | | | | Total: | |

## *Annex 3.2 List of LICs received from DSK*

| LIC INFORMATION | | | | | PROJECT INFORMATION | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SL No. | LIC Name | Location | DNCC/DSCC | Ward Number | Number of Inhabitants | Name of Project | Beginning | End of Project/Handover Date | Funding Agency (Donor) | Partner Org. | Service Delivery Model |
| 1 | Robidashpara | Robidashpara | DSCC | | | | | | Plan International | DSK | WaterATM |
| 2 | Sattala Staff Mohalla Bosti | Mohakhali | DNCC | 20 | 9000 | WASH4UrbanPoor | May-18 | Dec-22 | WaterAid through SIDA | DSK | CBO |
| 3 | Sattala Chowdhury Para | Mohakhali | DNCC | 20 | 11250 | WASH4UrbanPoor | | | | | CBO |
| 4 | Sattala Boundary Bosti | Mohakhali | DNCC | 20 | 9000 | WASH4UrbanPoor | | | | | CBO |
| 5 | Godawon Bosti | Mohakhali | DNCC | 19 | 2250 | WASH4UrbanPoor | | | | | CBO |
| 6 | Beder Bosti | Mohakhali | DNCC | 20 | 1800 | WASH4UrbanPoor | | | | | CBO |
| 7 | Earshad Nagar Bosti | Mohakhali | DNCC | 20 | 6750 | WASH4UrbanPoor | | | | | CBO |
| 8 | Vangadewal Bosti | Mohakhali | DNCC | 20 | 11250 | WASH4UrbanPoor | | | | | CBO |
| 9 | Korail Bosti | Mohakhali | DNCC | 19 | 81000 | WASH4UrbanPoor | | | | | CBO |
| 10 | Settelite Bosti | Mohakhali | DNCC | 19 | 11250 | WASH4UrbanPoor | | | | | CBO |
| 11 | Settelite Paschimpara Bosti | Mohakhali | DNCC | 19 | 4950 | WASH4UrbanPoor | | | | | CBO |
| 12 | T&T Bosti | Mohakhali | DNCC | 19 | 27000 | WASH4UrbanPoor | | | | | CBO |
| 13 | Sattala Pora Bosti | Mohakhali | DNCC | 20 | 11250 | WASH4UrbanPoor | | | | | CBO |
| 14 | Baganbari Bosti | Mohakhali | DNCC | 4 | 2250 | WASH4UrbanPoor | | | | | CBO |
| 15 | Lalashorai Jamiderbari Bosti | Mirpur | DNCC | 15 | 5400 | WASH4UrbanPoor | | | | | CBO |
| 16 | Lalashorai Maddapara Bosti | Mirpur | DNCC | 15 | 7650 | WASH4UrbanPoor | | | | | CBO |
| 17 | Lalashorai Tekpara Bosti | Mirpur | DNCC | 15 | 4500 | WASH4UrbanPoor | | | | | CBO |
| 18 | West Vashantek Bosti | Mirpur | DNCC | 15 | 4050 | WASH4UrbanPoor | | | | | CBO |
| 19 | Wapda Bosti | Mirpur | DNCC | 6 | 2250 | WASH4UrbanPoor | | | | | CBO |
| 20 | Jasim Mollah Bosti | Mirpur | DNCC | 6 | 1800 | WASH4UrbanPoor | | | | | CBO |
| 21 | Ilias Mollah Bosti | Mirpur | DNCC | 6 | 3825 | WASH4UrbanPoor | | | | | CBO |
| 22 | Kabir Mollah Bosti | Mirpur | DNCC | 6 | 2700 | WASH4UrbanPoor | | | | | CBO |
| 23 | Duaripara Bosti | Mirpur | DNCC | 6 | 27000 | WASH4UrbanPoor | | | | | CBO |
| 24 | Jahangirer Bosti | Mirpur | DNCC | 15 | 3600 | WASH4UrbanPoor | | | | | CBO |
| 25 | Nagra Madbar Bosti | Mirpur | DNCC | 6 | 2700 | WASH4UrbanPoor | | | | | CBO |
| 26 | Sattar Mollah Bosti | Mirpur | DNCC | 6 | 2250 | WASH4UrbanPoor | | | | | CBO |
| 27 | Rajur Bosti | Mirpur | DNCC | 2 | 2250 | WASH4UrbanPoor | | | | | CBO |
| 28 | Kalshi Balurmath | Mirpur | DNCC | 2 | 3150 | WASH4UrbanPoor | | | | | CBO |
| 29 | Kormitulla Bosti | Mirpur | DNCC | 2 | 9000 | WASH4UrbanPoor | | | | | CBO |

| LIC INFORMATION | | | | | PROJECT INFORMATION | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SL No. | LIC Name | Location | DNCC/DSCC | Ward Number | Number of Inhabitants | Name of Project | Beginning | End of Project/Handover Date | Funding Agency (Donor) | Partner Org. | Service Delivery Model |
| 30 | Godawon Bosti | Mohakhali | DNCC | 19 | 2250 | AFD-Lot-4 | Nov-17 | Oct-19 | DWASA through AFD | DSK | CBO |
| 31 | Beder Bosti | Mohakhali | DNCC | 20 | 1800 | AFD-Lot-4 | | | | DSK | CBO |
| 32 | Earshad Nagar Bosti | Mohakhali | DNCC | 20 | 6750 | AFD-Lot-4 | | | | DSK | CBO |
| 33 | Vangadewal Bosti | Mohakhali | DNCC | 20 | 11250 | AFD-Lot-4 | | | | DSK | CBO |
| 34 | Settelite Bosti (East) | Mohakhali | DNCC | 19 | 11250 | AFD-Lot-4 | | | | DSK | CBO |
| 35 | Settelite Paschimpara Bosti | Mohakhali | DNCC | 19 | 4950 | AFD-Lot-4 | | | | DSK | CBO |
| 36 | T&T Bosti | Mohakhali | DNCC | 19 | 27000 | AFD-Lot-4 | | | | DSK | CBO |
| 37 | Rajur Bosti | Mirpur | DNCC | 2 | 2250 | AFD-Lot-1 | | | | DSK, Nagorkik Sheba Foundation, NDBUS | CBO |
| 38 | Kalshi Balurmath | Mirpur | DNCC | 2 | 3150 | AFD-Lot-1 | | | | DSK, Nagorkik Sheba Foundation, NDBUS | CBO |
| 39 | Kormitulla Bosti | Mirpur | DNCC | 2 | 9000 | AFD-Lot-1 | | | | DSK, Nagorkik Sheba Foundation, NDBUS | CBO |
| 40 | Kalapani | Mirpur | DNCC | 2 | 4000 | AFD-Lot-1 | | | | DSK, Nagorkik Sheba Foundation, NDBUS | CBO |
| 41 | Beguntila | Mirpur | DNCC | 2 | 5000 | AFD-Lot-1 | | | | DSK, Nagorkik Sheba Foundation, NDBUS | CBO |
| 42 | Muktijuddha slum | Mirpur | DNCC | 8 | 1500 | AFD-Lot-2 | | | | DSK, IPD and BASA | CBO |

## *Annex 3.3 List of LICs received from SAJIDA Foundation*

| LIC INFORMATION | | | | | PROJECT INFORMATION | | | | | | Service Delivery Model |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SL No. | LIC Name | Location | DNCC/ DSCC | Ward Number | Number of Inhabitants | Name of Project | Beginning | End of Project/ Handover Date | Funding | Partner Org. | |
| 1 | City Polli | 14 no Outfall,Dholpur | DSCC | | 3261 | WASH4UrbanPoor | 2018 | 2022 | WaterAid, Bangladesh | SAJIDA Foundation | CBO |
| 2 | Telegu colony | | | | 1153 | WASH4UrbanPoor | 2018 | 2022 | WaterAid, Bangladesh | SAJIDA Foundation | CBO |
| 3 | Moddho Bosti | | | | 2476 | WASH4UrbanPoor | 2018 | 2022 | WaterAid, Bangladesh | SAJIDA Foundation | CBO |
| 4 | Pora Bosti | | | | 2925 | WASH4UrbanPoor | 2018 | 2022 | WaterAid, Bangladesh | SAJIDA Foundation | CBO |
| 5 | Ainaler Bosti | | | | 916 | WASH4UrbanPoor | 2018 | 2022 | WaterAid, Bangladesh | SAJIDA Foundation | CBO |
| 6 | Nobur Bosti | | | | 3042 | WASH4UrbanPoor | 2018 | 2022 | WaterAid, Bangladesh | SAJIDA Foundation | CBO |
| 7 | Adorsho Bosti | | | | 1074 | WASH4UrbanPoor | 2018 | 2022 | WaterAid, Bangladesh | SAJIDA Foundation | CBO |
| 8 | 96 Ghor | | | | 1305 | WASH4UrbanPoor | 2018 | 2022 | WaterAid, Bangladesh | SAJIDA Foundation | CBO |
| 9 | 38 Ghor Bashpotti | | | | 855 | WASH4UrbanPoor | 2018 | 2022 | WaterAid, Bangladesh | SAJIDA Foundation | CBO |
| 10 | Mannner Bosti | | | | 1039 | WASH4UrbanPoor | 2018 | 2022 | WaterAid, Bangladesh | SAJIDA Foundation | CBO |
| 11 | Robidash para | Wari | | 38 | 1035 | WASH4UrbanPoor | 2018 | 2022 | WaterAid, Bangladesh | SAJIDA Foundation | CBO |

Level 5, House 10/12, Road 1, Block B, Niketan
Gulshan-1 | Dhaka 1212 | Bangladesh
Web: www.lightcastlebd.com