DEVCO: Enhancing safe water supply and waste management for the vulnerable population affected by the Syria crisis in South Lebanon

MEAL Endline Report

Contents

I. Outcome Monitoring
A. Purpose

The endline survey aims to analyse the project objectives and enable the measurement of several indicators relating to both project components –water and solid waste.

Project outcomes that are intended to be measured:

Water

- Access to water: Proportion of targeted beneficiaries (M/W/B/G) that have increased access to water in adequate quantities.
- Perception of access to water:
  - Improved quantity available from the public networks due to reduction of leakages, increased supply
  - Improved quality through reduction of irregular connections, faulty joints, and better pipe materials
- Decrease in level of perceived tensions between communities related to water and sanitation as a result of the intervention
- Technical sustainability of water systems implemented according to the SLWE
- Perceived sustainability of water systems implemented according to the municipalities and local communities

Solid Waste

- General knowledge of waste management principles and change in solid waste management practices as a result of the intervention
- Proportion of beneficiaries reporting that the project interventions contributed to improving the solid waste collection service
- Proportion of beneficiaries with increased knowledge on alternative waste management solutions
- Proportion of host and refugee that are still engaged in the waste collection and sorting activities 3 months after the intervention

The residents in the 7 target areas are supposed to benefit from increased access to and better quality of water. They have also indirectly benefited from the improved capacity of the water establishment and better waste management solutions.

The impacts of these activities were measured through 4 endline tools (these are further elaborated in the 'Methodology' section below).
The baseline study analysed the initial perceptions of access to water, the service of the water establishment, water quality, water related expenses, and community tensions related to access to water, prior to the intervention.
These factors are important to understand at the beginning and at the end of the project to investigate the effectiveness of the project at achieving its goals, and whether any changes in these issues are related to the intervention itself. Moreover, it contributes directly to the project evaluation at the end to assess the impact of the EU WASH project.

The endline made use of a sample of HHs surveyed, and aimed to run group discussions to triangulate data needed to confirm the reliability and flow of water –this was not fully completed and will be further elaborated on in the 'Challenges' section below. The endline also involves the municipalities in assessing their perception of the sustainability of the water system, in addition to a technical assessment with the SLWE to measure the technical sustainability of the intervention.

B. Methodology

Beneficiary endline

We used a cluster random and statistically representative sample size proportionate in the areas of operation (Saida, Ghaziyeh, Lubiyeh, Bissariyeh, Bqosta, Aabra, and Darb El-Sim[1]) and proportionate to the population groups

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[1] The security situation during the data collection phase did not allow access to Darb Es-Sim, and therefore its share of the sample for the household surveys was transferred to Baissariyeh's sample.

(Lebanese host and Syrian refugee communities), while randomly selecting sub areas. Disaggregation of endline survey respondents was not possible since the data collection happened door-to-door and the field teams had little control over the gender of the respondents.

The survey was administered to a sample of the beneficiaries (n= 200)[2] throughout all areas of intervention (with the exception of Darb Es-Sim). A 95% level of confidence with a 7% margin of error was used to calculate the sample size (assuming that 90% of the sampled populations surveyed are connected to the water network).

A household quantitative survey was developed to gather data, utilizing tablets via ODK.

Beneficiary FGDs

Beneficiary FGDs were planned to be used to triangulate specific information from the quantitative survey, but more so to validate the assumptions used to measure social cohesion, access to water, and sustainability of the water intervention, in addition to gauge the change in waste management practices.

The sample unit is the beneficiary/resident in the areas of intervention (Lebanese and Syrian refugees, males and females) who will benefit from the WASH and awareness program. The sample was intended to be 14 FGDs whose participants benefited from both the WaSH intervention and the awareness component. 2 FGDs per area were to be organized separated according to the nationality.[3]

Municipality Endline/KIIs

This tool was run with 1 key municipality members per area with the exception of Saida where no one was available to interview despite many attempts to schedule an appointment. The tool focuses on the municipality perception of the sustainability of the water systems rehabilitated and implemented by CiL.

SLWE technical assessment

This tool focuses on the sustainability of the implemented water systems according to the water authority. This tool was administered to staff from 2 key departments in the SLWE (production and distribution) for all interventions in the 7 areas. The key staff were the heads of the afore-mentioned departments.

i. Challenges

Considering the methodology applied in this assessment, and due to security concerns and issues, the field teams were able to complete 200 assessments in 6 out of the 7 intervention areas. Below are the challenges faced with the methodology:

- Security incidents around Darb Es-Sim prevented the field staff from accessing the area.
- The random sampling being door-to-door shaped the participants and respondents to the endline survey whereby it was difficult to assess men and women in equal percentages.
- There was a difficulty in organizing 2 FGDs per area due to lack of ability by the municipality to secure the required number of participants and organizing the group discussions. The MEAL team resorted to the project's community mobilizer, who, in turn, sought different channels to reach out to the communities, with no success. Hence, only 1 FGD was conducted with the Syrian refugee residents of Saida. The findings of this FGD are considered in-conclusive and slightly indicative of the water situation in Saida.
- The MEAL team was unable to reach the mayor of Saida (or any other key municipality staff).

The aforementioned challenges, with the exception of the security situation in one of the target areas, call for the diversification of CIL's channels of communication and outreach so that they are not limited to the local government, rather expand these into social and civil associations in order to have a larger scope of assessment participants.

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[2] The sample according to the confidence interval and level is n=196, however, the field teams reached 200 HHs.

[3] Only 1 FGD with the Syrian refugee community in Saida was conducted. This is further elaborated in the 'Challenges' section.

II.   Key Findings
A.   Demographics and Respondents' Profiles

The highest percentage of the sample was in Ghaziyyeh and Saida, the two largest among the intervention areas[4].

Fig.1: Sample Distribution per Area

- ■ Aabra
- ■ Baissariyeh
- ■ Bqosta
- ■ Ghaziyeh
- ■ Loubiyeh
- ■ Saida - Ain El-Mir
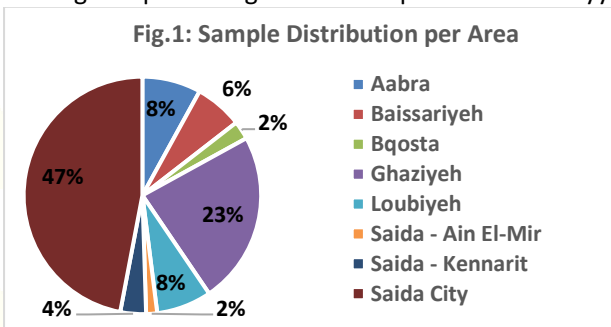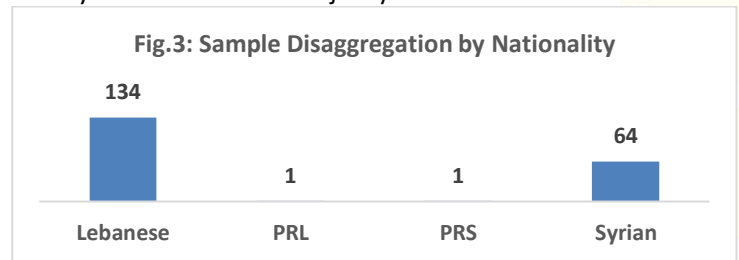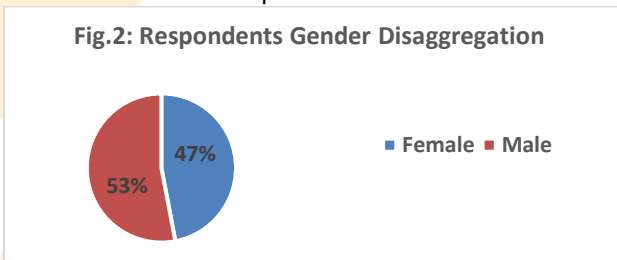- ■ Saida - Kennarit
- ■ Saida City

Figure 2 below shows the gender disaggregation of the respondents and their nationalities. 53% of respondents were males. 67% of the sample was Lebanese while the rest were Syrians in their vast majority.

Fig.2: Respondents Gender Disaggregation

- ■ Female ■ Male

Fig.3: Sample Disaggregation by Nationality

B.   Access to Water
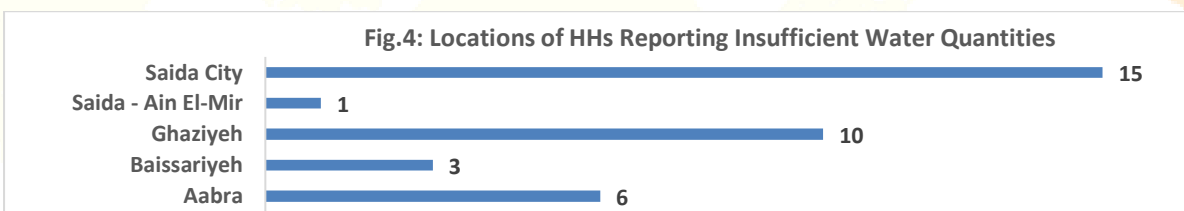#### i.   Connection to the Water Network

Only 1 out of the 200 sampled households (less than 1%) was found to be not connected to the water network. This household had a private (unprotected) water well as a source for their domestic water and considered that water from the well was available in sufficient quantities.

For the purpose of analysis on the water systems in the targeted areas, we will use the data reported by the 199 HHs that are connected to the water network[5].

ii.   Quantity of Water from the Network

Out of the 199 households connected to the water network, only 10% were found to be recently connected to the network (less than a year). These have most probably connected to the network by SLWE following the new water lines established in their areas.

35 households (almost 18%) reported not having sufficient quantities for their households domestic and drinking needs. These are located as shown in Figure 4 below where the majority was found in Saida area:

Fig.4: Locations of HHs Reporting Insufficient Water Quantities

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[4] The beneficiary residents of Kennarit and Ain El Mir (both of which benefited from the rehabilitation of wells) were calculated as part of Saida in the estimation of total beneficiaries.

[5] The entire sample will be used for analysis of water management practices, social cohesion and solid waste management practices.

59 HHs out of 199 reported improvement of water quantities within the past 4 months (prior to August when the endline survey was conducted). This make up around 30% of the sample. In comparison, a baseline finding was that 40% of the sampled HHs reported that water was available in adequate quantities.

When triangulating with the heads of municipalities, 100% of them stated that water quantities have vastly improved to the extent that people were no longer in need of buying trucked water or relying on other water sources, some of them were even using the water irresponsibly as a result of its abundance.

➢ The MEAL team opted for technical measurement of the water flow in the targeted sites and water systems to measure change in the water supply.
➢ According to table 1 below, the water flow increased from 365.5 liters/second to 731 liters/second. This meant that water supply increased from 6,275 m³/day to 27,410.40 m³/day. Taking into consideration that the new network, which had a 40% leakage ratio prior to the intervention, now has 0% leakage, therefore the new and final water supply is 38,374.56 m³/day – This is 511.55% increase in the water quantities for the rehabilitated quantities.

Table 1: Water Flow Calculations – Prior to and Post Intervention

	Water Flow (L/s)	Water Flow (m3/day)
Prior to Action	365.5	6,275
With Action	731	27,410.40

	Well code	Pump station	Running hours	L/s	m3/hr	m3/day
	H2	Rafic Hariri	22	40	144	3168
	H3	Rafic Hariri	22	55	198	4356
	H4	Rafic Hariri	22	85	306	6732
	F1	Fawar	22	40	144	3168
	F2	Fawar	22	40	144	3168
	F3	Fawar	22	75	270	5940
	Q	Qenarit	8	9.5	34.2	273.6
	E	Ein el Mir	8	9	32.4	259.2
	Loubieh	Loubieh	8	12	43.2	345.6
Total				365.5	1315.8	27,410.40

Leakage in Existing Network	40%
Leakage in New Network	0%

	Final Water Flow rate (m3/day)
Without Leakage	38,374.56

The negative response of the households may be due to the fact that little time was given to assess the change in water quantities between the completion of the infrastructure works and the endline assessment; and therefore, people's perception has not altered significantly. Another reason could be the timing when the endline was conducted which was in August, that is, the peak of summer where HHs' water needs increase and therefore any improvement from previous summers is not felt by the residents.
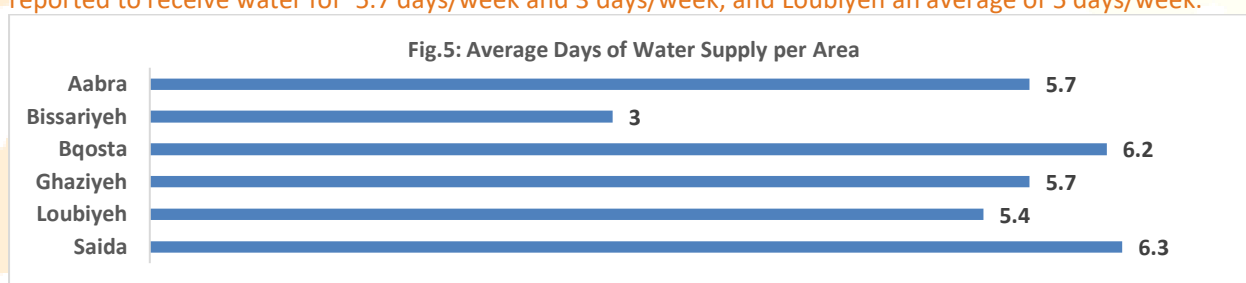
It is also important to note that the endline was conducted during the summer when the villages are overcrowded with residents coming from the cities for the summer season. This is one reason why the positive change was not perceived by the respondents as consumption reached its peak.
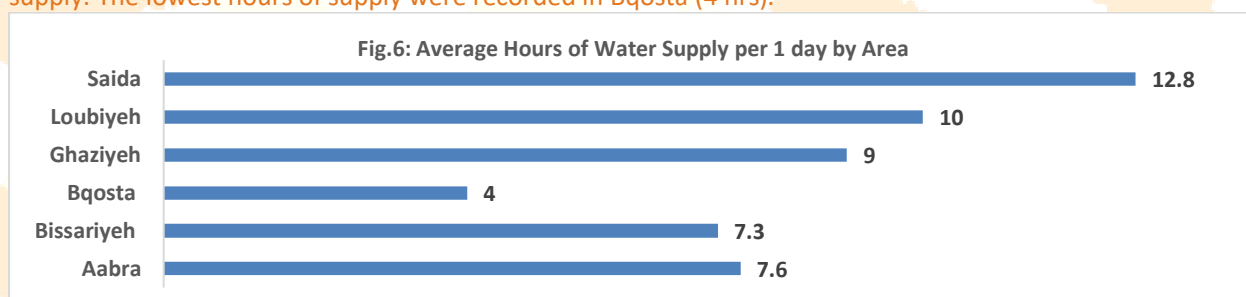
i. Water Supply

On the number of days when water is supplied, answers of respondents from the same area differed greatly and are shown in Table 2 below.

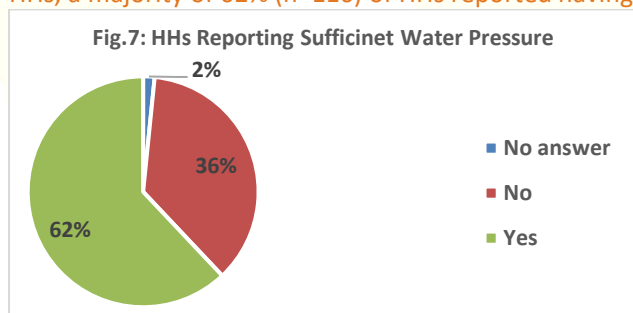| Table 2: Nb. of Water Supply Days per Area						
Water Supply (Days)	Saida	Aabra	Bissariyeh	Ghaziyyeh	Lubiyeh	Bqosta
0 days	1.96%		8.33%	4.26%	20%	
1 day				6.38%		
2 days	0.98%		8.33%	4.26%		
3 days	5.88%	6.25%	75.00%	2.13%		
4 days	2.94%	18.75%		10.64%		
5 days	6.86%	18.75%		2.13%	6.67%	40.00%
6 days	1.96%	12.50%		70.21%	6.67%	
7 days	79.41%	43.75%	8.33%	4.26%	66.67%	60.00%
Total	100%		100%	100%	100%	100%

The average supply days of water from the network was highest in Bqosta and Saida which receive around water 6 days/week on average. Bissariyeh is supplied with water for an average of 3 days/week, while Aabra and Ghaziyeh were reported to receive water for 5.7 days/week and 3 days/week, and Loubiyeh an average of 5 days/week.

Fig.5: Average Days of Water Supply per Area

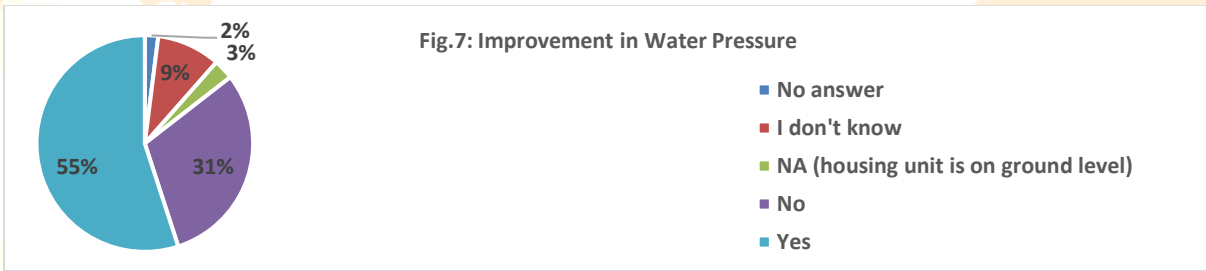| Area	Days
Aabra	5.7
Bissariyeh	3
Bqosta	6.2
Ghaziyeh	5.7
Loubiyeh	5.4
Saida	6.3

When calculating the average hours for 1 day of supply, Saida records the highest with almost 13 continuous hrs of water supply. The lowest hours of supply were recorded in Bqosta (4 hrs).

Fig.6: Average Hours of Water Supply per 1 day by Area

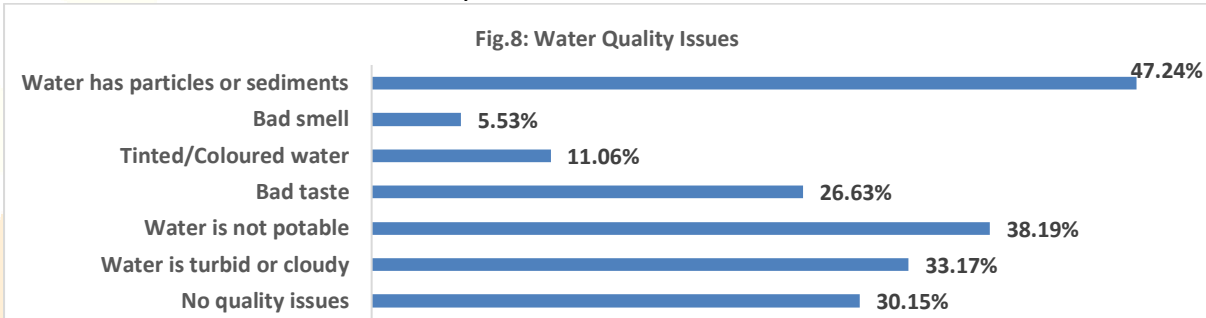| Area	Hours
Saida	12.8
Loubiyeh	10
Ghaziyeh	9
Bqosta	4
Bissariyeh	7.3
Aabra	7.6

When asked about the water pressure and its sufficiency reach the water tank on your roof, 13 out of the 199 connected households stated that this is inapplicable to them as their tanks are not located on the roof. Out of the remaining 187 HHs, a majority of 62% (n=116) of HHs reported having enough pressure for the water to reach their tanks (Figure 7).

Fig.7: HHs Reporting Sufficinet Water Pressure
- No answer: 2%
- No: 36%
- Yes: 62%

As for improvement in water pressure within the past 4 months, 55% of the sampled households reported improvement. Answers came as shown in Figure 7 below.
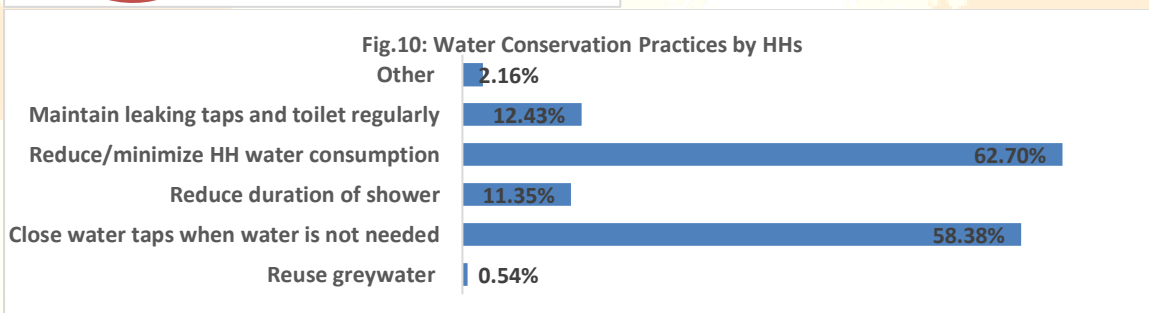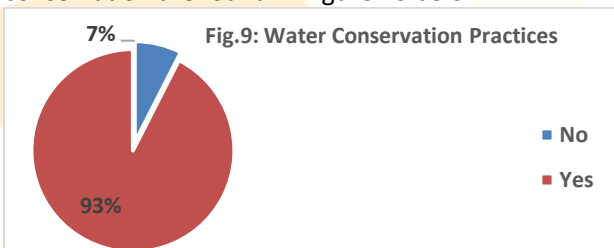
Fig.7: Improvement in Water Pressure

- No answer
- I don't know
- NA (housing unit is on ground level)
- No
- Yes

ii. Water Quality

Fig.8: Water Quality Issues

Water has particles or sediments	47.24%
Bad smell	5.53%
Tinted/Coloured water	11.06%
Bad taste	26.63%
Water is not potable	38.19%
Water is turbid or cloudy	33.17%
No quality issues	30.15%

In all 6 areas where the endline was conducted, water from the network had several serious quality issues at once. Residents reported that the water is particularly filthy and contains particles and sediments, is turbid, and unsuitable for drinking. 30% of the respondent households considered that the water has no quality issues.

C. Water Conservation

185 out of 200 HHs stated that they adopt several practices at once to conserve water –this makes up to 93% of the total assessed HHs. Using double counting, we found that out of those HHs who practice water conservation, they mostly reduce their consumption for HH usage and closing the water taps when water is not needed. Other methods of water conservation are found in Figure 10 below.

Fig.9: Water Conservation Practices

- No
- Yes

Fig.10: Water Conservation Practices by HHs

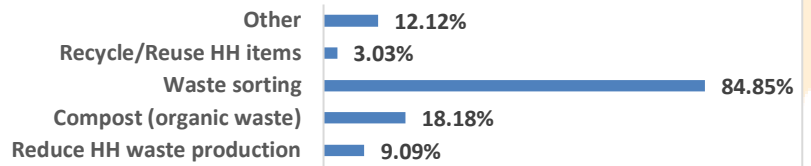|	
Other	2.16%
Maintain leaking taps and toilet regularly	12.43%
Reduce/minimize HH water consumption	62.70%
Reduce duration of shower	11.35%
Close water taps when water is not needed	58.38%
Reuse greywater	0.54%

D. Solid Waste Management

Only 17% of the respondent households applied methods to manage solid waste. 83% have no related practices whatsoever despite the fact the 94% of them stated that solid waste management is crucial. Figure 12 shows the different ways of managing solid waste by the remaining HHs (using double counting) and the most common practice was found to be waste sorting.
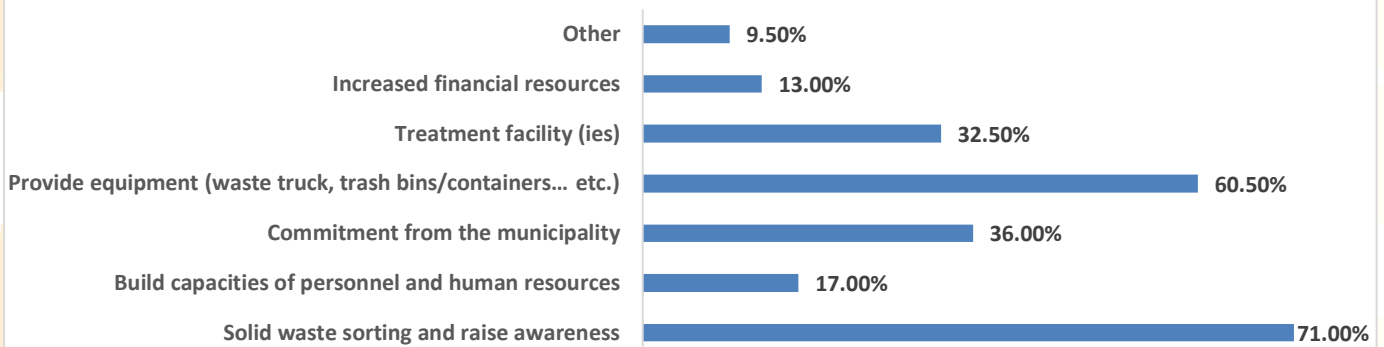
Fig.11: Solid Waste Management Practices

Fig. 12: Solid Waste Management Practices by HHs

Using double counting, we calculated the responses of the interviewees regarding what is lacking in order to improve the solid waste service in their area of residence. The asnwers varied from provision of equipment such waste trucks, trash bins/containers… etc., to solid waste sorting and raise awareness/knowledge among residents. Other responded by stressing the importance of establishing solid waste sorting facilities and building the capacities of personnel and human resources working for the service providers. Increasing the financial resources allocated for this service was another among the responses.

Fig.13: Gaps to Improving Solid Waste Management by Municipalities

Compared to the baseline, when asking the people of Lubiyeh, Ghaziyeh, and Bissariyeh (the 3 areas where the solid waste campaign and sorting action took place), 68% of the people involved in the campaign responded that they do apply methods for solid waste management compared to 36% from the baseline.
Among the people invilved in the paper sorting and collection action, 72% were found to be still involved in it, while the rest stopped the sorting in their HHs.

While the 70% target of improved knowledge in solid waste management was not reached, one can argue that behavioral change does not occur within a few months and requireds further awareness raising. However, the result indicates that there has been a significant improvement in the solid waste practices of the residents. Knowing that 72% of these people are still involved in the solid waste action, we can consider that these 72% also have improved knowledge in their solid waste management practices.
It is recommended for future interventions that improvement in knowledge be measured through in-depth KAP surveys so as to accurately measure both knowledge and behaviour.

E. Social Cohesion

In general, community relations among the different components are acceptable with only 9.5% (n=19) reporting negative views between the residing communities. Nonetheless, 24 respondents stated that there's currently tensions between the communities, among which 6 related these to access to basic services. Among those 6 who reported that pressure on basic services and resources caused tensions, 5 cases considered that access to water has been compromised and caused the tensions. This makes up 21% of the overall population reporting community tensions.
When comparing to the baseline, where 8% reported community tensions due to pressure on the water service, we notice an increase of 12% rather than a 30% decrease in community tensions relating to pressure on the water service.
This finding comes as no surprise -according to the interagency social stability sector 1st quarterly report for 2017, "the social stability landscape in Lebanon appears to be changing with competition for jobs emerging as the key driver of

tensions between communities. The beginning of 2017 saw an increase in citizens' protests against Syrian labor competition and the closure of Syrian-owned shops in several municipalities across Lebanon"[6].

According to the Social Stability sector, "the overall spike in inter-community tensions, and antagonistic rhetoric and discourses throughout Lebanon in the aftermath of the series of attacks on the Al-Qaa village in late June 2016 revealed that despite the largely peaceful situation, underlying causes of tensions remain prevalent in the country and constitute a situation conducive to conflict".

The security concerns of the local communities pose another constraint to inter-community relations as "the vast majority of people report feeling less safe than before the crisis – and as many as 91 percent of host communities believe that the presence of displaced Syrians poses a security threat to them" [7].

This has led some municipalities to opt for curfews and other restrictions as a tool to address local residents' security concerns. Bissariyeh appears to have very high sources of tensions and have curfews and regulations against the refugee population in place being implemented, while Ghaziyeh has moderate sources of tensions.[8]

F. Perception of Sustainability by Municipalities

The MEAL team interviewed heads of municipalities/key municipal staff in 6 out of 7 areas of intervention. Their responses regarding the sustainability of the rehabilitated water systems and installed equipment were similar to a large extent with all of them stating that the intervention is durable and will not require any further maintenance for at least 20 years, while some approximated the durability to more than 30 and 40 years.

On another note, and as one aspect of sustainability, all the interviewed reported that the municipality is in direct contact and liaison with the SLWE and should be able to maintain the newly established/rehabilitated water systems. All 6 respondents stated that none of the material was dysfunctional by the time of delivery.

This certifies that the perceived sustainability by the local governments is set at 100%, thus CIL reaching its target for this indicator.

G. Technical Sustainability by SLWE

The MEAL team approached two departments directly supervising and coordinating the project with CIL at SLWE – these are the 'Distribution' and 'Production' departments in the water establishments. The heads of these departments filled a survey developed by the WaSH team and which measure technical sustainability of the project in each of the 7 municipalities.

The head of the Production Department at the SLWE stated that the rehabilitated infrastructure is expected to be sustainable and the only obstacle facing proper functioning is the power supply by Electricité du Liban. None of the installments was dysfunctional after handing over to the water establishment.

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[6] SOCIAL STABILITY 2017 Quarter 1 Dashboard. (2017). [pdf] Beirut: Inter-Agency Coordination Lebanon. Available at: https://reliefweb.int/sites/reliefweb.int/files/resources/Interagency_Quarterly_1st_2017SocialStability.pdf [Accessed 13 Oct. 2017].

[7] Sector Outcomes. (2017). [pdf] Beirut: SOCIAL STABILITY SECTOR. Available at: https://data2.unhcr.org/en/documents/download/53667 [Accessed 13 Oct. 2017].

[8] Sources of Tension - South Lebanon - July 2017. (2017). Beirut: Inter-Agency Coordination - Social Stability Sector.