

**Evaluation of the Peacebuilding Impact: Water Supply
Improvement in the Host Communities
of Syrian Refugees in Jordan**

Evaluation Report

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JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

International Development Center of Japan Inc. (IDCJ)

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1. Abstract

This evaluation features JICA’s grant aid project, which aims to promote social stability in northern Jordan through improved quality of and access to water supply services by constructing new water distribution networks and improving the existing networks. The evaluation aimed to answer the following evaluation question: “Has the water service improvement—achieved through the construction of new water distribution networks and improvement of existing networks— contributed to the promotion of social stability between Syrian refugees and their host communities” in Hawwara and Sarieh Districts in Irbid Governorate, Jordan. Baseline and endline surveys were administered for the purpose of this evaluation. Based on the analysis of the survey results, a theory of change (that describes pathways to reach the project goal through project activities) was verified from the initial outcome of improved water quantity, supply time, and pressure, to the intermediate outcome of improved feelings over and perception of water supply, and to the final outcome of improved (or not worsened) social relations.

A. Initial Outcome	B. Intermediate Outcome	C. Final Outcome
<ul style="list-style-type: none"> - Increase in the amount of water use from the public water supply network - Increase in the days and hours that water can be used (supplied) - Improved water pressure 	Improved feelings over and perception of water supply	Improved (or not worsened) social relations <ul style="list-style-type: none"> - Mutual trust - Attitude accepting diversity - Perceived level of equality and discrimination - Perceived socioeconomic pressure and vulnerability - Feelings of safety

Theory of Change (Simplified Version)

First, the before-after intervention comparison for the entire project area confirmed outcome achievements at all levels of the pathways to reach the project goal expected in the Theory of Change, though the extent of the change was still modest. The decreasing water level at the water source and timing of the endline survey—that is, when the supply through the new water distribution networks was still undergoing adjustments and therefore yet to be stabilized—are considered to have affected the mixed improvement in the initial outcome (regarding water quantity, supply time, and water pressure). Nevertheless, the intermediate outcome seemed to be achieved, with the drastically decreased number of complaints to the water service provider, the improved perceptions of water quantity and quality, and the overall satisfaction level. The final outcome of social relations between Syrian refugees and their host communities demonstrated a slight improvement in some psychological indicators while presenting a slight decrease in other indicators as compared to the baseline results, which indicated that the relationship between the two groups was already positive. Considering the difficult economic situation and deteriorating water availability that could have adversely affected the social tension, it can be inferred that the project contributed to the social stability in the target area.

Second, the comparison of the subzones wherein the intervention progressed fastest (set as the treatment group) and those with the least progress as of the period of the endline survey (set as the

control group) did not confirm the pathways to reach the project goal expected in the Theory of Change, as only slight changes were observed in the initial and final outcomes despite some positive changes in the intermediate outcome. This is most likely due to the limitation in identifying the treatment and control groups clearly. However, overall, this analysis suggested the effect of water pressure improvement.

Third, by contrast, the comparison of those who recognized being connected to the new network (set as the treatment group) and those who did not (set as the control group) partly confirmed the pathways described in the Theory of Change with some positive results from the initial to final outcome levels. While the initial outcome was evident in terms of the improved water pressure, there was no noticeable difference in the water shortage between the two groups. Nevertheless, the intermediate outcome indicated positive differences, with more respondents in the treatment group perceiving water quantity and quality improvement and being overall satisfied with the public water supply. Furthermore, the final outcome, that is, the status of social relations was better in the treatment group in eight of nine questions (simple comparison as of the endline survey); additionally, there were statistically significant differences in improvement for some indicators between the treatment and control groups (Difference-in-Difference). Therefore, it can be inferred that the project contributed to preventing worsening the social relations in the target area.

In sum, the evaluation results indicate that once the installation and adjustment of the new water distribution networks are fully completed, the positive changes depicted in the evaluation will be enhanced further, and the improved perception regarding the water supply and the resultant positive feelings will contribute to social stability in the target communities. However, it should be noted that the original evaluation design to compare pure treatment and control groups had to be restructured into the above three analyses during the course of the study, owing to the change of the project implementation schedule affected by the COVID-19 pandemic and other reasons.

2. Introduction

2-1. Background

(1) Background

JICA promotes impact evaluation to verify the usefulness of its projects/programmes. Additionally, JICA has long supported refugees and host communities in conflict-affected countries and areas. However, the effect of such projects/programmes on the refugees and host communities has been only confirmed by ex-post evaluations using the five DAC evaluation criteria (relevance, effectiveness, efficiency, impact, and sustainability)¹; more precise verification of the effect was needed. To this end, JICA commissioned the International Development Center of Japan Inc. (IDCJ) in February 2020 to conduct the impact evaluation of the “Programme for Urgent Improvement of Water Sector for the Host Communities of Syrian Refugees in Northern Governorates” (Phase 2).

¹ The evaluation criteria by the Organisation for Economic Co-operation and Development (OECD)’s Development Assistance Committee (DAC).

(2) Objectives

This impact evaluation's objectives were as follows: (1) to quantitatively clarify the impact of the aforementioned programme on the social stability in the target districts, and (2) to extract lessons learned and make recommendations for JICA that can be utilized in similar projects in the future.

(3) Intervention Summary

The intervention (i.e., the abovementioned programme) to be evaluated is described as follows:

Table 1: Intervention Summary

Item	Explanation
Background	Since the civil war started in Syria in 2011, many thousands of Syrians have been forced to leave their home country and flee to neighboring countries and beyond. According to the office of the United Nations High Commissioner for Refugees (UNHCR), Jordan hosts over 650 thousand Syrian refugees (this figure is of registered refugees only). Most of these refugees have been staying in host communities rather than in refugee camps. With renewable freshwater resources per capita at 129m ³ /year (2014), which is less than 30% of the "absolute water scarcity" level of 500m ³ /year, Jordan is one of the most water-scarce countries in the world. Water service coverage in northern governorates is 97%. Still, the water resource (mainly groundwater) is limited, and the water supply system was of inadequate capacity, high leakage and dilapidated since before the refugee influx. In Irbid Governorate, while the water supply has been once every week on average, the water supply conditions worsened due to increased demand. Arguably, this has caused friction between Syrian refugees and Jordanians in some areas.
Project name	The Programme for Urgent Improvement of Water Sector for the Host Communities of Syrian Refugees in Northern Governorates (Phase 2)
Scheme	Grants in Association with an International Organization
Project site	Irbid Governorate, the Hashemite Kingdom of Jordan
Implementer	United Nations Office for Project Services (UNOPS)
Project duration	From May 22, 2017 – September 30, 2025 (including a-12 months defect liability period) (Planned completion of the house connection works as of the endline survey of this evaluation: October 2022)
Project objective	The project aims to promote social stability in Jordan through the improved quality of, and access to water supply services for Jordanian residents in the Hawwara and Sariéh Districts, as well as for the Syrian refugees in the host communities and surrounding areas, through the construction of new water distribution networks, in addition to improving the existing networks.
Target population	Hawwara District (population: approximately 24,000 people) and Sariéh District (population: approximately 46,000 people) in Irbid Governorate. The population is as of 2016. The actual target population was calculated via population projection.
Expected project effect	(1) Water will be distributed in the Project area with adequate water pressure ranging from 0.25 to 0.75 Mpa through setting distribution zones in Hawwara and Sariéh and installing new pipes and replacing aged pipes (Before the intervention, the water pressure was between 0.11 to 0.5 Mpa). (2) Leakage will be reduced by pipe rehabilitation. In addition, adequate water pressure will improve the amount of water supply in the same duration and equitable water distribution to residents in Hawwara and Sariéh. This will reduce the unserved areas.
Project content	- Distribution pipe 105.8km (replacement of existing pipe: 50.7km, installation of new pipe: 55.099km) (Pipe diameter 63 to 300 mm)

(as of the preparatory survey)	<ul style="list-style-type: none"> - Trenchless (Jacking) Works: 5 places - Pressure Reducing Valve: 2 sets <p>The above includes components that were of high priority but could not be included in the Phase 1 Project, which installed distribution pipes in the neighboring Hofa-Bait Ras and part of Hawwara.</p> <p>(During the project period, installation of service pipes and water meters and connection works (household connection) were added to the project components).</p>
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2-2. Research Design

(1) Evaluation Question

This evaluation aimed to answer the following question:

Has the water service improvement through the construction of new water distribution networks and improvement of existing networks contributed to the promotion of social stability² between Syrian refugees and their host communities in the Hawwara and Sarih Districts of Irbid Governorate in the Hashemite Kingdom of Jordan?

(2) Theory of Change

To answer the evaluation question, a theory of change was developed by the evaluation team, confirmed by JICA, and verified through this evaluation (See Appendix 2). Five psychological indicators were identified to measure the social relations as the final outcome of the project, based on similar studies on social cohesion in refugee-hosting communities.

A. Initial Outcome	B. Intermediate Outcome	C. Final Outcome
<ul style="list-style-type: none"> - Increase in the amount of water use from the public water supply network - Increase in the days and hours that water can be used (supplied) - Improved water pressure 	➔	<p>Improved (or not worsened) social relations</p> <ul style="list-style-type: none"> - Mutual trust - Attitude accepting diversity - Perceived level of equality and discrimination - Perceived socioeconomic pressure and vulnerability - Feelings of safety

Figure 1: Theory of Change (Simplified Version)

2-3. Population and Sampling

As of the baseline survey, this evaluation was designed to compare the treatment and control groups utilizing the Area Matching Design, with the Hawwara project area as the treatment and the Sarih project area as the control group (the latter is also the target area of the intervention, but it was expected that the connection works to new networks in this area would be completed later than this evaluation)³.

² Although the project objective aims for the “promotion of social stability,” it was defined as “social relations that have not deteriorated” in this evaluation as a measurable, concrete outcome.

³ It should be noted that the administrative boundary of Hawwara and Sarih Districts differ from that of the project target areas. The area boundary of YWC water distribution also differs from the project boundary.

For the above design, the sample size was decided as 500 households (HH) each in Hawwara and Sarieh, based on Power Analysis (using the standard software “G*Power”).

Although simple random sampling is ideal, “equal interval sampling” was employed as the sampling method for this evaluation. This method can secure the same result as that of random sampling and ensures a well-balanced representation of the population from both areas.

The evaluation team obtained the customer list of the area from the Yarmouk Water Company (YWC). Subsequently, to add non-subscribers to the population, buildings without subscriptions were counted except for those clearly not for residence (e.g., buildings used for storage, etc.) on the GIS map. Based on the population and necessary sample size stated above, the equal interval was calculated at 6HH in Hawwara and 9HH in Sarieh. The result of the calculation and breakdown of the samples are summarized in Tables 2 and 3.

Table 2: Population and Calculated Equal Intervals

Population	Hawwara project area	Sarieh project area
Households on the YWC customer list (a)	3,314	5,087
Building without contract (possibly non-subscribers) (b)	118	96
Subscriber HH outside the project boundaries (c)	137	418
Total population for sampling (d)=(a)+(b)-(c)	3,295	4,765
Sample size needed (e)	500	500
Calculated Interval (f) = (d) / (e)	6.6	9.5

Although the evaluation team could not obtain a list of Syrian refugees living in the area, assumedly, the refugees are included in the target population for the following two reasons: First, the number of registered Syrian refugees in Hawwara and Sarieh Districts was 8,314 as of September 2020, accounting for over 10% of the population. Second, the evaluation team confirmed that the project area includes areas that have a relatively dense population of Syrian refugees based on the information obtained from the UNHCR.

Table 3: Breakdown and Location of Sample Households

Total number of samples: 1,100			
Hawwara		Sarieh	
558		542	
Subzone	n	Subzone	n
1	65	3-A	71
2-1	82	3-B	91
2-2	32	3-C	21
3-1	128	4	169
3-2	97	4-A	190
4	36		
E-1	62		
E-2	56		

2-4. Design of Impact Evaluation

As stated above, the evaluation was originally designed to compare the treatment and control groups based on the phased schedule of the distribution pipe installation in the two project areas. However, at the later stage, it became clear that construction work of “house connection” was to be implemented in Sarieh and Hawwara simultaneously. Therefore, having a clear-cut treatment group and a control group as planned became difficult. Consequently, JICA and the evaluation team agreed on the following impact evaluation design: the basic analysis of the before-after intervention comparison for the entire project area. Two-sample mean comparison test (i.e., independent t-test) was applied in most cases if the data were continuous or the data were based on Likert-type scales (5-point scales). Additionally, the chi-squared test was applied if the data were binomial (1 or 0).

Furthermore, by administering the endline survey in the middle of the intervention, the evaluation also aimed to measure the project impact using the “With-Without Comparison” design by comparing the households that are already connected and those not yet connected within the target area. However, the progress of the installation and connection work on the ground proved that one could not separate a treatment group from a control group, as the completion dates for 13 subzones, once scattered over one year, became squeezed into a mere four-month period owing to reasons such as COVID-19. Moreover, the start of service using the new network could not be identified either since adjustments were ongoing between the old and new networks making the improved supply intermittent.

Under this circumstance, this evaluation attempted the following two additional analyses: 1) Comparison of Subzones 1E+2E (n=118) of Hawwara, where the intervention progressed fastest, and Subzone 4 (n=169) of Sarieh, where the intervention had the least progress as of the period of the endline survey. 2) Comparison of those who responded “yes” and “no” for the question “A-09 Are you connected to the newly installed/replaced distribution pipe?” In the endline survey, 88% (n=951) of the samples (91% in Hawwara and 85% in Sarieh) responded that their houses had been connected to the newly installed/replaced distribution pipe. For the additional analyses, Difference-in-Difference (DID) analysis was adopted in addition to simple two-sample mean comparison tests. DID considered the difference between pre- and post-intervention of the same variables for the target and control groups and compared the differences to measure the intervention’s effect.

2-5. Data Collection

Delayed by months from the original plan due to the COVID-19 impact, the baseline survey was administered from December 2020 to February 2021 by subcontracting to a national consulting firm, Dajani Consulting. The same consultant administered the endline survey in September 2022. After obtaining the government’s permission, the trained surveyors visited sample households for the survey with necessary COVID-19 preventive measures. Key informant interviews (KIIs) with community leaders and focus group discussions (FGDs) including local residents and Syrian refugees (male, female, and mixed groups) were also conducted to supplement the survey data. The evaluation team obtained technical advice from the Department of Statistics of Jordan on the sampling method and survey questionnaire.

2-6. Limitation of Analysis

As stated above, the evaluation could not identify clear-cut treatment and control groups. Consequently, identifying the cause of the difference (or lack thereof) observed in the baseline and endline survey results was difficult. Even with the two additional analyses, which select and compare the treatment and control groups from the entire sample, it should be noted that the grouping would not be 100% accurate. For example, if one looks at the first additional analysis of the comparison between Hawwara Subzone E1 + E2 and Sariéh Subzone 4, both groups have a similar ratio of samples who answered that their houses already had the new connection (94.7% and 98.8%). Although this does not necessarily mean that they already received supply from the new connection, clearly, neither group is 100% treatment or control. Similarly, in the second additional analysis that compared those who answered “yes” regarding having the new connection and those who answered “no,” the basis of the answer is considered to be either improved water supply or the engineer’s visit to conduct the connection work. Again, the latter does not necessarily mean that the household already receives water from the new network. To supplement this, the evaluation team utilized the results of the qualitative part of the study, such as KIIs, FGDs, stakeholder interviews, and site observations.

Furthermore, the endline survey was administered toward the end of the (then) house connection work period, merely a few months after the new pipeline started providing service, so this study captures the situation wherein some untreated groups still remain. Therefore, even the treatment group started receiving the project’s benefits from only one or a few months. Consequently, this duration might not be sufficiently long to cause the psychological changes expected as the final outcome.

Additionally, the results of the balance check, which ensures no major difference exists between the treatment and control groups at the baseline, did not prove that the two groups compared in the two additional analyses were fully equivalent. Difference-in-Difference (DID) analysis was used to mitigate this limitation.

3. Descriptive Statistics

Of the sample households, 95.7% and 97.6% were subscribers to the public water service in the baseline and endline surveys, respectively. Among the endline survey respondents, 796 (72%) were from the same households as that of the baseline, and 304 (28%) were the new occupants of the same building/dwelling. Residence mobility was also observed in the survey results based on the length of residence in the project area. While the average length of residence of residents in the area was 29.8 years in the baseline survey, the same was 23.4 years in the endline survey administered a year and nine months later. Other than the public water network, 91% of the sample households in the endline survey relied on water tankers (private and public services), purchased bottled water, or used a private well to obtain water. The average total volume of the water tanks was 5.8 m³ at the baseline and 4.94 m³ at the endline⁴.

⁴ The difference may be explained by a few households in the baseline survey with enormous tank sizes, such as over 100 m³. While there were 18 households with a total tank size over 25 m³ in the baseline survey, only four households in the endline survey fell in this category, with the largest tank at 75m³.

The demographic analysis revealed no major difference between the baseline and endline respondents. According to the endline survey, the average number of family members was 5.5. While 95% of the households were male-headed (5% female-headed), 30% of the respondents were female (70% male) in the endline survey, though only 86% of the baseline samples were male-headed (13% female-headed). The final educational level of the household head showed that more than one-third (37%) had a university degree or above, 46% finished vocational or secondary education, and 15% finished primary education⁵. While 80% lived in self-owned residences, 20% rented apartments. Regarding the employment of the family member earning the most, 49% were employed, 23% were self-employed, and 13% were unemployed. Compared to the baseline survey, unemployment increased by 1.7 percentage points for respondents in the endline survey. The household annual income range demonstrated that 40% were below 1,500 JD (roughly USD 2,115).

Of the respondents, 66 (6%) and 87 (8%) were Syrians in the two surveys, respectively. Among the Syrians, according to the endline survey, 14 (16%) had lived in the area since before 2010, and the remaining 73 (84%) came to the area after the Syrian crisis. The majority originated from Daraa, while some originated from Aleppo, Homs, and other places. Interestingly, only seven Syrian households answered both surveys, indicating that Syrians tended to move frequently.

4. Analysis 1: Before-After Comparison of the Entire Sample

4-1. Survey Results

In this section, before-after comparison is conducted for the entire project area to determine whether the changes expected in the Theory of Change presented in Figure 1 are observed.

(1) Initial Outcome

As presented in Table 4, the increase in the amount of water use from the public network seemed to be partly achieved. The ratio of respondents who experienced water shortage from the public water supply pipe in summer decreased by nearly 17 percentage points (from 58.3% to 41.4%) with statistical significance⁶. This is even more positive considering that in Jordan in general, water shortage is more severe in August (depicted in the endline survey) than in May (depicted in the baseline survey). It was observed in the endline survey that the water spending was unchanged or slightly increased, which was the same trend as the baseline. Nonetheless, the use of public water for drinking and cooking purposes increased, and the use of bottled water for cooking decreased. For water spending and the use of public water, see Tables in Appendix 1.

⁵ In the baseline survey, university-degree and postgraduate-degree holders accounted for 33.7%, secondary education for 5.5%, vocational education for 0%, and primary education for 55.5%. The reason for the differences in the two surveys' respondents regarding vocational and primary education is not known.

⁶ The shortage in the winter was not severe from the beginning, and the responses for the winter in the endline survey depicts the period before the intervention.

Table 4: Initial Outcome (entire sample)

<Sample: All area>

Item (for Ratio-items)	BL (Baseline)			EL (Endline)			Diff.	p-value	Sig.
	#Yes	#Total	%	#Yes	#Total	%			
A01 Water shortage 1 (Summer) May 2020 v.s. Aug 2022	647	1075	(60.2%)	432	1069	(40.4%)	-19.8%	>0.000	***
A02 Water shortage 2 (Winter: Dec-Feb) 2020 v.s. 2021	180	1073	(16.8%)	139	1086	(12.8%)	-4.0%	0.009	***
A2 Water shortage from public pipe (Summer)	620	1064	(58.3%)	451	1089	(41.4%)	-16.9%	>0.000	***
A3 Water shortage from public pipe (Winter)	182	1059	(17.2%)	136	1088	(12.5%)	-4.7%	0.003	***

Item (for Continuous value-items)	BL avg.	EL avg.	Diff.	t	p-value	Sig.	Effect size	Judge.
A4 Water Pressure over the past month (5-point likert scale (4-0))	1.8785	1.8927	0.0142	0.27	0.784	n.s.	0.01	Very small
A5 Water supply accuracy over the past month (5-point likert scale (4-0))	2.80	2.65	-0.15	-3.12	0.0019	***	-0.10	Small
A1a2 The length of supply each time (hours)	6.15	5.75	-0.40	-2.7	0.0071	***	-0.08	Very small

Note: Significance level: *** 1% significance, ** 5% significance, * 10% significance, n.s. not significant.

The effect size, or the size of the difference in the average values against the consolidated deviation, is calculated as the difference of two averages divided by the combined standard deviation. It offers how large the effect (i.e., impact) or the difference is. The general criteria are small (around 0.2), medium (around 0.5), and large (around or larger than 0.8). (Cohen, 1988)

Source: IDCJ study team

The frequency of water supply was predominantly unchanged at once a week, which was also confirmed by the YWC (Table 5). Table 4 illustrates the length of the water supply each time and the accuracy of the public water supply schedule slightly worsened from the baseline survey. The water pressure did not change overall⁷.

Table 5: Frequency of Water Supply

A-1 Frequency of water supply from the public pipe in Summer (Baseline (BL):2020, Endline (EL):2022)

	<All Samples>		<Harawwa>		<Sarieh>	
	BL_A1a	EL_A1a	BL_A1a	EL_A1a	BL_A1a	EL_A1a
1 Every day	0	2	0	2	0	0
2 Every other day	0	0	0	0	0	0
3 Once every three days	2	2	0	0	2	2
4 Once every four days	1	3	0	3	1	0
5 Once every five days	1	13	0	12	1	1
6 Once every six days	7	39	4	34	3	5
7 Once a week	916	931	469	447	447	484
8 Once every two weeks	103	67	61	37	42	30
9 Never	51	38	21	20	30	18
Total	1083	1096	555	555	526	540

Source: IDCJ study team

(2) Intermediate Outcome

To verify whether the improved feelings over and perception of water supply were achieved, the evaluation examined the level of complaints made, the respondents' perception of water quantity and quality, their overall satisfaction with the public water, and their perception of the causes of the water shortage. The results are presented in Tables 6 and 7. First, the number of complaints the respondents

⁷ According to UNOPS, it is reasonable for some residents to perceive that the water pressure has been reduced after the implementation of the project. As the network was designed to enhance and stabilize water pressure as a whole, some areas that had been enjoying significantly higher water pressure than other areas could receive lower (adequate) water pressure after the relocation to the new system.

made in one month was dramatically reduced by almost half, from 2.47 to 1.29 times a month. Indeed, YWC also commented that the complaints it receives dramatically dropped post-intervention (from approximately 500 per week to 100 per week in Sarieh and Hawwara in total). Second, measured on a 5-point Likert-type scale (0 to 4), the respondents' perceptions of water quantity and quality improved with medium effect sizes. Third, the ratio of respondents who are overall satisfied with the public water increased from 39% to 55% (16 percentage points increase).

Table 6: Intermediate Outcome (entire sample)

<Sample = All Areas>

Question items	n	Baseline avg	Endline avg	Diff.	SE	t/X2	p	Sig.	Effect Size	Judg.
B1_How many complaints made	972	2.50	1.29	-1.2	0.21	5.80	>0.01	***	0.19	Small
B2_Water quantity improved	1020	1.84	2.31	0.47	0.05	10.33	>0.01	***	0.33	medium
B3_Water quality improved	1029	1.80	2.30	0.50	0.43	11.77	>0.01	***	0.37	medium
B4_Overall satisfaction with the public water (Ratio of Yes)	BL1068,EL1078	38.8%	54.8%	16.1%	-	1.00	>0.01	***	-	-
B6_Water shortages have led to discontent	1038	2.91	3.07	0.15	0.04	-3.62	>0.01	***	0.11	small
B7_Aware JICA&UNOPS support this Project (Ratio of Yes)	BL1087&EL1086	36.8%	45.4%	8.6%	-	0.99	>0.01	***	-	-

Source: IDCJ study team

Fourth, as presented in Table 7, the sample households attributed the water shortage mainly to the water supply service itself, as the largest and second largest reasons chosen were the same in the two surveys, "Public water supply is not frequent enough" and "Water flow/pressure (pumped through pipes) is weak." Although the population influx ranked third as the second important cause, overall, it was not regarded as the primary factor causing water shortage in the endline survey (sixth among the 10 choices, including "none of the above" and "other"), while it was the third largest reason in the baseline survey. The same was also found in the survey results for this item analyzed by nationality. The importance of the population influx among the perceived factors causing water shortages was reduced, especially among Jordanian respondents (See Appendix 1).

Table 7: Perceived Factors Causing Water Shortage (Endline survey)

B5 In case your household faced water shortage/s, rank the most important reasons (Multiple choice, Maximum 3 Choices)

EL_5	No1	No2	No3	Total
1 Public water supply is not frequent enough (n=570)	365	130	75	570
2 Not enough storage capacity (n=445)	129	196	120	445
3 More people joined the household and the water was not enough for everyone (n=337)	138	94	105	337
4 Cannot afford to buy water from water shops and water tankers (n=307)	74	113	120	307
5 Due to population influx in the area, the water was not enough for everyone (n=304)	64	143	97	304
6 Private water vendors cannot be trusted (n=194)	29	68	97	194
7 The private well dried up (n=46)	9	14	23	46
8 The water flow/pressure (pumped through pipes) is weak (n=559)	156	178	225	559
9 None of the above (259)	111	52	96	259
98 other: _____ (42)	3	37	2	42
Total	1,078	1,025	960	3,063

Source: IDCJ study team

In sum, the perception regarding the water supply was improved, and resultant positive feelings were achieved based on the before-after comparison for the entire project area.

(3) Final Outcome

To verify whether the final outcome, that is, the improved (or not being worsened) social relations,

has been achieved, five indicators (mutual trust, attitudes accepting diversity, perceived level of equality and discrimination, perceived socioeconomic pressure and vulnerability, and feelings of safety) in nine questions on a five-point Likert-type scale (0 to 4, 2 at the middle) were included in the survey. The results revealed that one of the two questions (C1 and C2) on mutual trust (C2), two of the three questions (C3, C4 and C5) on attitudes accepting diversity (C3 and C4), and one of the two questions (C6 and C7) on perceived level of equality and discrimination (C6) slightly improved after the intervention, though effect sizes were small (Table 8). The rest of the components did not improve or remained unchanged.

Table 8: Final Outcome (entire sample)

<Sample = All samples>

Question items	n	Baseline avg	Endline avg	Diff.	SE	t	p	sig.	Effect Size	Judge.
C1_Mutual trust	1085	3.09	3.12	+0.03	0.03	1.01	0.311	n.s.	0.031	Very small
C2_Rely on neighbor	1060	2.50	2.81	+0.31	0.04	7.12	>0.01	***	0.220	Small
C3_Happy to work side by side	1074	2.74	2.83	+0.09	0.04	2.39	0.02	**	0.074	Small
C4_Happy with child's friends (diversity)	1080	2.79	2.90	+0.11	0.03	3.10	>0.01	***	0.324	Small
C5_Live well together	1073	2.96	2.94	-0.02	0.03	-0.56	0.58	n.s.	-0.020	Very small
C6_They are helpful	1065	2.87	2.97	+0.10	0.03	3.3	>0.01	***	0.100	Small
C7_Not been treated differently	961	3.04	2.94	-0.10	0.03	-3.17	>0.01	***	-0.102	Small
C8_Employment led to discontent	1079	3.14	3.11	-0.03	0.03	0.86	0.39	n.s.	-0.029	Very small
C9_Feel safe in neighborhood	1092	3.26	3.11	-0.15	0.03	-5.47	>0.01	***	-0.163	Small

Source: IDCJ study team

Additionally, the evaluation also examined the psychological change from the baseline for the Jordanian and Syrian respondents separately (Appendix 1). Based on this comparison, it was found that the difference between the two groups was reduced in the endline survey regarding some indicators. For example, the average score for “I trust most people living in my neighborhood” (C1) was above “3” (Agree) in both groups, though there was a statistically significant difference between the two groups at the baseline, with Syrians being more neutral regarding the statement⁸. This suggests a positive change in social relations between Syrians and Jordanians.

4-2. Overall Analysis

Overall, the before-after the intervention comparison for the entire project area confirmed the changes expected in the Theory of Change in all levels from the initial to the intermediate and final outcomes, though the extent of the change was still modest.

Regarding the initial outcome, the water shortage greatly improved in the summer, the season when the water shortage was generally severe in Jordan. The improvement was not large enough to reduce the water expenditure in the survey results. However, there were specific examples where the public water supply improved to the extent that the households no longer needed to buy water from expensive water tankers, thus saving water-related expenses. The scarcity of water at the water source is the most likely reason for the limited improvement of water shortage and the unchanged water pressure and supply hours (frequency and lengths), irrespective of the connection/supply status.

⁸ However, it should be noted that the difference in sample size is large between the two groups.

According to YWC and UNOPS, the water level of the reservoir is decreasing every year. Nonetheless, the two organizations commented that the water leakage and non-revenue water had been significantly reduced, though the quantitative data was not available. The number of water tankers contracted by YWC also dropped to more than one-fifth compared to the pre-intervention time. A user in Hawwara commented that he no longer needed the motor pump to pump water to the tank on the roof, as the water pressure was sufficiently strong, and a significantly shorter time was needed to fill the tank post-intervention.

The KIIs and FGDs demonstrated that the degree of improvement was mixed both in Hawwara and Sarih. This is most likely due to the mixed status of installation of the new connection and yet-to-be-stabilized supply through the new connection. At the time of the survey, the process of merging the old and new systems was ongoing. Therefore, while most of the households were already connected to the new system, they continued receiving intermittent supply from the new network. However, anecdotal evidence revealed that there were buildings in Hawwara that previously did not receive any water supply due to being situated at a higher altitude than the surrounding areas but started receiving water post-intervention. The number of respondents who answered “never” to the question of water supply frequency was reduced from 51 to 38 overall, despite the fact that those not subscribed to the network were 33 and 36 in the two surveys, respectively.

Although the achievements of the initial outcome were overall positive but mixed, the intermediate outcome, that is, “the improved feelings over and perception of water supply,” seemed to be achieved. This was evidenced by the following: drastically decreased number of complaints to YWC, the improved perceptions of water quantity and quality, and the improved satisfaction level regarding the public water service. In addition to the actual improvement depicted in the initial outcome, the awareness of external support for this project may have also contributed to the results. Nearly half of the respondents were aware of JICA and UNOPS’s support of this project, indicating an 8.5%-point increase after the intervention. The awareness was raised most likely because the COVID-19 regulations had been lifted; therefore, the community engagement officer of the project could hold public relations sessions in each area. The mere fact that house connection work requires household visits must have raised awareness, as well.

Despite the notable improvement, it should be noted that nearly half of the respondents of the endline survey were not satisfied with the public water service. Numerous complaints were raised in FGDs. This is understandable, considering the mixed achievement of the initial outcome. Indeed, the survey results continued indicating that the water shortages led to discontent in the community in general, which was also confirmed in KIIs and FGDs. Nevertheless, the discontent was toward the service itself (supply hours and pressure) and unfair distribution (different distribution hours depending on areas and the use of motor pumps by some, which does not leave enough water for others). The decreased mention of the population influx as the cause of the water shortage may indicate that the feelings of the population that connected the water shortage to the refugee presence became less common. Indeed, it was highlighted in many FGDs in the endline survey that there is no connection between the water issue and the relationship between Jordanians and Syrians—such a statement was not heard in the baseline survey,

where all FDGs confirmed the need to improve water distribution networks and expected that it would contribute to improving relations between Jordanians and Syrian refugees.

The final outcome, that is, the improved (or not worsened) social relations between the Jordanian host communities and Syrian refugees, showed a slight improvement regarding some indicators and a slight decrease in terms of other indicators. Although social relations did not improve greatly, at least they did not worsen. Indeed, the survey results were already positive in the baseline survey, in which most questions were rated around “3” (agree with the statement). FGDs and KIIs in the two surveys also showed that the two communities had no problem living together before and after the intervention except for some isolated cases; this is attributable to the fact that Syrians and Jordanians share similar customs and traditions, and many have family relations. It is understood that although the tension was higher until the time when the project was formulated in 2017, with Jordanians feeling that Syrians would take their jobs and exhaust their public services, and some friction among youth adding to the general tension, the situation was stabilized after 2018 with time passage and clarification of the types of jobs that refugees can do.

In sum, the changes expected in the Theory of Change were overall realized at all levels, though with mixed achievement at individual indicator levels. However, one cannot conclude that this project directly contributed to the final outcome, considering that numerous factors⁹ other than the water supply situation—including time passage—exist that affected the relationship, as highlighted in FGDs and KIIs. Nonetheless, factors such as employment opportunities and living expenses that are thought to affect social tension have not improved, but worsened, according to KIIs. Furthermore, unequal distribution of scarce water by pump users and discontent in the community were raised in both surveys. In such a circumstance, it can be inferred that if the project was not implemented, considering the deteriorating water source and supply infrastructure, the social relations, irrespective of nationality, could have worsened; therefore, the project contributed to the social stability in the target area.

5. Analysis 2: Comparison between the Treatment (Hawwara E1 and E2) and Control Groups (Sarieh 4)

5-1. Simple Comparison

In this section, the simple two-group comparison of the endline survey results is conducted between the treatment group, which is stated to have received treatment earlier, named “Hawwara E1+E2,” and the control group, where the treatment progress was slower, called “Sarieh 4.”

(1) Initial Outcome

The difference observed in the water shortage situation between the two groups was not significant. The water pressure showed a positive difference (2.20 for Hawwara E1+E2 against 1.59 for Sarieh 4 via the five-point scale from “4” = always strong to “0” = always weak) in the treatment group with a medium to large effect size. However, the supply accuracy and supply hours were better in the

⁹ There were no major debilitating incidents, such as fights, nor any specific external support projects that greatly contributed to the social stability.

control group (Table 9). This may have been affected by the fact that the ratio of connection to the new pipeline recognized by the respondents was nearly the same between the two groups. Although this does not necessarily mean all of them are actually “treated,” as the users only know about the status of the physical connection work at their premises and do not know whether the supply is full, intermittent, or not yet started from the new network.

Table 9: Initial Outcome Comparison (Hawwara E1+E2 vs. Sarieh4)

<Sample: Hawwara E1+E2 vs Sarieh4>

Item (for Ratio-items)	Hawwara E1+E2(Treatment G)			Sarieh 4 (Control G)			Diff.	p-value	Sig.
	#Yes	#Total	(%)	#Yes	#Total	(%)			
EL_A01 Water shortage 1 (Summer) Aug 2022	51	116	(44.0%)	76	168	(45.2%)	1.3%	0.832	n.s.
EL_A02 Water shortage 2 (Winter) Dec 2021-Feb 2022	25	116	(21.6%)	13	169	(7.7%)	-13.9%	0.001	**
EL_A03 Connected to public network?	107	113	(94.7%)	165	167	(98.8%)	4.1%	0.043	*
EL_A09 Connected to new distribution pipe	97	114	(85.1%)	141	163	(86.5%)	1.4%	0.739	n.s.
EL_A2 Water shortage from public pipe (Summer)	49	115	(42.6%)	80	166	(48.2%)	5.6%	0.356	n.s.
EL_A3 Water shortage from public pipe (Winter)	18	115	(15.7%)	14	168	(8.3%)	-7.3%	0.056	*

Item (for Continuous vaue-items)	Treatment G.	Control G.	Diff.	t	p-value	Sig.	Effect size	Judge.
	Hawwara E1+E2	Sarieh4						
A4 Water Pressure over the past month (5-point likert scale (4-0))	2.20	1.59	0.61	5.23	>0.000	***	0.63	Med.-Large
A5 Water supply accuracy over the past month (5-point likert scale (4-0))	2.40	2.75	-0.35	-2.61	0.009	***	-0.31	Small-Med.
A1a2 The length of supply each time (hours)	4.95	6.40	-1.45	-4.14	>0.000	***	-0.49	Medium

Source: IDCJ study team

(2) Intermediate Outcome

Overall, the perception regarding the water supply seems to be better in the areas where the intervention progressed faster, though the number of complaints indicated otherwise. Even though the initial outcome did not present significant difference in this regard, the respondents’ perceptions of water quantity and water quality improvement in Hawwara E1+E2 were higher than those in Sarieh 4. Table 10 illustrates that the level of overall satisfaction with the public water service was higher in Hawwara E1+E2 than in Sarieh 4 (13 percentage points higher, 57% to 43.9%).

Table 10: Intermediate Outcome (Hawwara E1+E2 vs. Sarieh 4)

<Sample = Hawwara E1+E2 vs Sarieh4>

Question items	n	Treatment Group		Diff.	SE	t/X2	p	Sig.	Effect Size	Judge.
		Hawwara E1+E2	Sarieh4							
EL_B1_How many complaints made	102vs159	1.61	0.63	0.98	0.30	-3.22	>0.01	***	0.40	Medium
EL_B2_Water quantity improved	114vs167	2.54	1.93	0.62	0.12	5.03	>0.01	***	0.59	Medium
EL_B3_Water quality improved	114vs168	2.56	1.94	0.61	0.11	5.66	>0.01	***	0.65	Medium-Large
EL_B4_Overall satisfaction with the public water (Ratio of Yes)	114vs168	57.0%	43.9%	13.1%	-	4.63	0.03	**	-	-
EL_B6_Water shortages have led to discontent	113vs156	3.01	2.92	0.09	0.09	-0.95	0.35	n.s.	0.12	Small
EL_B7_Aware JICA&UNOPS support this Project (Ratio of Yes)	159vs107	66.4%	34.5%	31.9%	-	27.24	>0.01	***	-	-

Source: IDCJ study team

(3) Final Outcome

As presented in Table 11, most of the indicators did not reveal significant differences at the endline, except for two indicators for attitudes accepting diversity (C3 and C4), with positive results for the treatment group, and a negative result for the treatment group for the feelings of safety (C9).

Table 11: Final Outcome (Hawwara E1+E2 vs. Sarieh 4)

<Sample: Hawwara E1+E2 (Treatment area) vs. Sarieh 4 (Control area) >

Question items	n	Hawwara E1+E2	Sarieh4	Diff.	SE	t	p	sig.	Effect Size	Judge.
C1_Mutual trust	168vs114	3.06	3.16	-0.10	0.07	-1.5	0.13	n.s.	-0.183	Small
C2_Rely on neighbor	167vs114	2.71	2.75	-0.04	0.11	-0.41	0.68	n.s.	-0.046	Very small
C3_Happy to work side by side	168vs114	2.89	2.64	0.26	0.09	2.75	>0.01	***	0.215	Small
C4_Happy with child's friends (diversity)	168vs114	2.96	2.75	0.21	0.08	2.65	>0.01	***	0.309	Small-Medium
C5_Live well together	166vs115	2.83	2.89	-0.06	0.07	-0.77	0.44	n.s.	-0.100	Small
C6_They are helpful	167vs115	2.91	2.79	0.12	0.08	1.53	0.13	n.s.	0.181	Small
C7_Not been treated differently	167vs115	2.93	2.86	0.07	0.07	0.93	0.36	n.s.	0.115	Small
C8_Employment led to discontent	167vs115	2.92	3.05	-0.13	0.08	1.59	0.11	n.s.	-0.198	Small
C9_Feel safe in neighborhood	169vs115	2.97	3.15	-0.18	0.07	-2.52	0.01	**	-0.298	Small-Medium

Source: IDCJ study team

5-2. Difference-in-difference Analysis

The balance check, which ensures that the treatment and control groups do not have any major difference at the baseline, was applied to the treatment group, “Hawwara E1+E2,” and the control group, “Sarieh 4.” The results in the Tables in Appendix 1 indicate that a certain degree of variables presented statistically significant differences, though the effect sizes were negligible or extremely small. Therefore, the difference-in-difference (DID) analysis was conducted.

(1) Initial Outcome

The better improvement in water pressure in the treatment group observed in the simple comparison was also confirmed in DID.

(2) Intermediate Outcome

The higher perceptions of water quantity and quality improvement in the treatment group were confirmed in DID. The extent of “the discontent led by the water shortage within the community” decreased among the treatment group, suggesting a slight improvement in the water shortage problem and its effect on people’s feelings.

(3) Final Outcome

Although one positive (C3) and one negative (C9) difference were observed between the two groups, there was not much statistically significant difference between the two groups in DID (Table 12).

Table 12: DID Comparison (Hawwara E1+E2 vs. Sarieh 4)

<Initial Outcome>

Group: Hawwara E1+E2 vs. Sarieh 4 (1 vs.0)

Analysis method: DID

Question Item	Survey Question in EL	n	D_EL-BL		DID Diff.	t	p	Sig.	Size of difference	
			Hawwara E1+E2	Sarieh4					difference	Judge.
A4	Difference of EL - BL: Over the past month, how was the <u>water pressure</u> your household received from the public network (when water is available)? (5-point likert scale (4-0))	107 vs.161	1.08	0.53	0.56	-4.11	>0.000	***	0.50	Med.-Large
A5	Difference of EL - BL: Over the past month, how <u>accurate</u> was the the public network water distribution schedule by YWC? (5-point likert scale (4-0))	115 vs. 152	-0.67	0.24	-0.91	5.01	>0.000	***	-0.59	Small-Med.
A1a2	Difference of EL - BL: The length of supply each time (hours) (following question A1 "Have ofen did you receive water from the public network?")	116 vs.161	0.19	-0.53	0.72	-1.46	0.145	n.s.	0.18	Small

<Intermediate Outcome>

Group: Hawwara E1+E2 vs. Sarieh 4 (1 vs.0)

Analysis method: DID

Question Item	Survey Question in EL	n	D_EL-BL		DID Diff.	t	p	Sig.	Size of difference Judge.	
			Hawwara E1+E2	Sarieh 4						
B1	How many complaints made	101 vs.152	-0.52	-1.41	0.89	-1.35	0.178	n.s.	0.17	Small
B2	Water quantity improved	114 vs.148	0.68	0.02	0.66	-3.98	>0.000	***	0.48	Medium
B3	Water quality improved	110 vs.152	0.75	-0.05	0.80	-5.31	>0.000	***	0.63	Medium
B6	Water shortages have led to discontent	108 vs.149	-0.35	0.09	-0.44	2.80	0.006	***	0.35	Small~Med.

<Final Outcome>

Group: Hawwara E1+E2 vs. Sarieh 4 (1 vs.0)

Analysis method: DID

Question Item	Survey Question in EL	n	D_EL-BL		DID Diff.	t	p	Sig.	Size of difference Judge.	
			HawwaraE1+E2	Sarieh4						
C1	Mutual Trust	114 vs.166	0.02	0.17	-0.16	1.32	0.188	n.s.	-0.16	Small
C2	Rely on neighbors	111 vs.155	0.27	0.31	-0.04	0.22	0.825	n.s.	-0.03	Small
C3	Happy to work side by side	113 vs.163	0.20	-0.06	0.26	-1.76	0.079	*	0.21	Small
C4	Happy with child's friends (diversity)	113 vs.164	0.19	0.01	0.18	-1.38	0.169	n.s.	0.17	Small
C5	Live well together	114 vs. 162	-0.07	-0.06	-0.01	0.07	0.945	n.s.	0.008	Very small
C6	They are helpful	114 vs.161	0.11	-0.04	0.15	-1.20	0.233	n.s.	-0.146	Small
C7	Not been treated differently	115 vs.124	-0.03	-0.19	0.16	-1.23	0.220	n.s.	0.164	Very small
C8	Employment led to discontent	115 vs.163	-0.18	-0.05	-0.13	1.08	0.281	n.s.	-0.13	Small
C9	Feel safe in neighborhood	115 vs.167	-0.35	-0.10	-0.25	2.26	0.024	**	-0.27	Small

Source: IDCJ study team

5-3. Overall Analysis

The Theory of Change was not confirmed by Analysis 2, a comparison between the treatment group, “Hawwara E1+E2,” and the control group, “Sarieh 4.” Regarding the initial outcome, there was no significant difference except for the more improved water pressure in the treatment group both in the simple comparison and DID. With the ratio of connection to the new pipeline recognized by the respondents being nearly the same between the two groups, the change that this analysis could identify was limited.

Nonetheless, the intermediate outcome showed more positive results for the treatment group, with higher perceptions of water quantity and quality improvement and overall satisfaction with the public water service. This was also confirmed in DID analysis. Interestingly, the extent of “the discontent led by the water shortage within the community” decreased among the treatment group, while the endline score itself was higher than that of the control group. In addition to the significantly high awareness of the external support to this project in the treatment group (66.4%) compared to the control group (34.5%), this may also be explained by the importance of water pressure that is often raised in FGDs. In the target area, most of the houses have water tanks on the rooftop, and people fill the tank when public water is distributed once a week in most cases. Therefore, the water pressure can be considered a crucial factor in affecting the satisfaction level of the users regarding the public water service. Indeed, while the simple comparison of the entire area in Section 4 showed Hawwara had better water pressure than Sarieh in general, the level of water pressure in “Hawwara E1+E2” was even better than the whole Hawwara project area (2.20 to 2.08).

Regarding the final outcome, only one indicator (two question items) revealed a positive difference between the two groups in the simple comparison, of which only one was confirmed in DID. Therefore, despite the positive results in the intermediate outcome, this analysis did not present many

contributions of the project to the final outcome at the endline. This may be because of the weak association between the water situation and refugee-host community relations as compared to other factors or the limitation of the evaluation design (the lack of precise treatment and control groups and evaluation timing).

6. Analysis 3: Comparison between the Treatment (Households Recognizing New Connection) and Control Groups (Households Recognizing No New Connection)

6-1. Simple Comparison

In this section, the simple two-group comparison of the endline survey results is conducted between the treatment group, or those who answered “yes” to the question, “Are you connected to the newly installed distribution pipe?” (n=951) and the control group, who answered “no” (n=129).

(1) Initial Outcome

Although the difference in water shortage was not statistically significant, the water pressure, supply accuracy, and supply hours all showed positive differences in the treatment group, with small to medium effect sizes (Table 13).

Table 13: Initial Outcome Comparison (Connected to new public network “Yes” vs. “No”)

<Sample: Connected to new pipe "Yes" vs. "No">

Item (for Ratio-items)	Connect new "Yes"			Connect new "No"			Diff.	p-value	Sig.
	#Yes	#Total	(%)	#Yes	#Total	(%)			
EL_A01 Water shortage 1 (Summer) Aug 2022	371	948	(39.1%)	57	128	(44.5%)	-5.4%	0.242	n.s.
EL_A02 Water shortage 2 (Winter) Dec 2021-Feb 2022	116	938	(12.4%)	22	128	(17.2%)	-4.8%	0.128	n.s.
EL_A03 Connected to public network?	940	946	(99.4%)	97	126	(77.0%)	22.4%	>0.000	***
EL_A09 Connected to new distribution pipe	951	951	(100%)	0	129	(0.0%)	100.0%	>0.000	***
EL_A2 Water shortage from public pipe (Summer)	392	949	(41.3%)	51	121	(42.1%)	-0.8%	0.859	n.s.
EL_A3 Water shortage from public pipe (Winter)	118	939	(12.6%)	17	121	(14.0%)	-1.5%	0.645	n.s.

Item (for Continuous vaue-items)	Treatment G.	Control G.	Diff.	t	p-value	Sig.	Effect size	Judge.
	"Yes"	"No"						
A4 Water Pressure over the past month (5-point likert scale (4-0))	1.93	1.54	0.39	3.79	0.0002	***	0.38	Medium
A5 Water supply accuracy over the past month (5-point likert scale (4-0))	2.70	2.28	0.42	3.89	0.0001	***	0.42	Medium
A1a2 The length of supply each time (hours)	5.72	4.94	0.78	3.39	0.0007	***	0.28	Small-Med.

Source: IDCJ study team

(2) Intermediate Outcome

Overall, it was observed that the perception regarding water supply seems to be better in the households already connected to the new network, though the number of complaints indicated otherwise. As presented in Table 14, the perceptions of water quantity and quality improvement among the “yes” respondents were higher than those of the “no” respondents. The level of overall satisfaction with the public water service was higher in the “yes” respondents compared to the “no” respondents (34.9 percentage points higher, 58.8% to 23.9%).

Table 14: Intermediate Outcome (Connected to new public network “Yes” vs. “No”)

<Sample = New connection Yes vs No>

Question items	EL A-09 Connected to new distribution pipe?									
	n	"Yes"	"No"	Diff.	SE	t/X2	p	Sig.	Effect Size	Judge.
EL_B1_How many complaints made	892vs108	1.36	0.86	0.50	0.28	-1.79	0.07	*	0.18	Small
EL_B2_Water quantity improved	947vs118	2.35	1.97	0.37	0.10	3.87	>0.01	***	0.37	Medium
EL_B3_Water quality improved	949vs119	2.33	1.99	0.34	0.09	3.86	>0.01	***	0.37	medium
EL_B4_Overall satisfaction with the public water (Ratio of Yes)	114vs168	58.8%	23.9%	34.9%	-	51.15	>0.01	***	-	-
EL_B6_Water shortages have led to discontent	926vs124	3.06	3.13	-0.065	0.07	0.90	0.37	n.s.	-0.09	Very small
EL_B7_Aware JICA&UNOPS support this Project (Ratio of Yes)	159vs107	46.5%	40.3%	6.2%	-	1.69	0.19	n.s.	-	-

Source: IDCJ study team

(3) Final Outcome

Overall, the analysis indicated improved social relations by the comparison between the households with new public connections (“yes”) and those without (“no”). All items, except for C8, for which a smaller score is better, demonstrated statistically significant positive effects with medium to small effect sizes (Table 15).

Table 15: Final Outcome (Connected to new public network “Yes” vs. “No”)

<Sample : New connection YES vs No>

Question items	Treatment Group		Control Group		Diff.	SE	t	p	sig.	Effect Size	Judge.
	n	"Yes"	"No"								
C1_Mutual trust	126vs946	3.14	2.93	0.22	0.06	3.83	>0.01	***	0.369	Medium	
C2_Rely on neighbor	125vs946	2.83	2.68	0.15	0.09	1.68	0.09	*	0.163	Small	
C3_Happy to work side by side	125vs946	2.88	2.50	0.38	0.08	4.74	>0.01	***	0.447	Medium	
C4_Happy with child's friends (diversity)	125vs946	2.93	2.73	0.20	0.07	2.79	>0.01	***	0.266	Small	
C5_Live well together	126vs940	2.97	2.78	0.19	0.06	3.26	>0.01	***	0.303	Small~Medium	
C6_They are helpful	128vs941	2.99	2.85	0.14	0.07	2.09	0.04	**	0.203	Small	
C7_Not been treated differently	124vs935	2.98	2.66	0.32	0.06	5.01	>0.01	***	0.481	Medium	
C8_Employment led to discontent	128vs943	3.12	3.02	0.10	0.07	-1.53	0.12	n.s.	0.144	Small	
C9_Feel safe in neighborhood	128vs950	3.12	2.99	0.13	0.06	2.23	0.03	**	0.211	Small	

Source: IDCJ study team

6-2. Difference-in-difference Analysis

In the balance check, the size of the difference in the average values against the consolidated deviation between the two groups was insignificant in most questions. However, it should be noted that the difference in sample size between the two groups was large (about 7:1).

(1) Initial Outcome

The results of the simple comparison were confirmed, as the positive differences in water pressure, supply accuracy, and supply hours were also observed in DID. However, it should be noted that the supply accuracy and length worsened from the baseline survey, though the extent of the decline was better in the treatment group than in the control group.

(2) Intermediate Outcome

While respondents in the treatment group in the simple comparison at the endline made more complaints, the actual score improved from the baseline. The higher perceptions of water quantity and quality improvement in the treatment group were confirmed in DID.

(3) Final Outcome

Compared to the simple comparison wherein eight items exhibited positive differences between the two groups, there were only four items for which the two groups were different with statistical significance (Table 16). Indeed, the control group's scores for all of these four items were worse than the baseline, and the improvement level of the treatment group was very small. Therefore, it is not that the project contributed to the improved social relations; rather, it contributed to preventing relations from worsening.

Table 16: DID Comparison (Connected to new public network “Yes” vs. “No”)

<Initial Outcome>

Group: A09_Yes vs. No (1 vs.0)

Analysis method: DID

Question Item	Survey Question in EL	n	D_EL-BL A09=Yes	D_EL-BL A09=No	DID Diff.	t	p	Sig.	Size of difference	Judge.
A4	Difference of EL - BL: Over the past month, how was the water pressure your household received from the public network (when water is available)? (5-point likert scale (4-0))	919 vs.106	0.82	0.52	0.30	-2.58	0.01	***	0.26	Small~Med.
A5	Difference of EL - BL: Over the past month, how accurate was the the public network water distribution schedule by YWC? (5-point likert scale (4-0))	919 vs. 111	-0.11	-0.42	0.31	-2.06	0.04	**	0.21	Small
A1a2	Difference of EL - BL: The length of supply each time (hours) (following question A1 "Have ofen did you receive water from the public network?")	934 vs.125	-0.30	-1.30	1.01	-2.16	0.031	**	0.21	Small

<Intermediate Outcome>

Group: A09_Yes vs. No (1 vs.0)

Analysis method: DID

Question Item	Survey Question in EL	n	D_EL-BL A09=Yes	D_EL-BL A09=No	DID Diff.	t	p	Sig.	Size of difference	Judge.
B1	How many complaints made	851 vs. 105	-1.20	-1.29	0.08	-0.12	0.904	n.s.	0.01	Very small
B2	Water quantity improved	891 vs. 109	0.53	0.05	0.48	-3.31	0.001	***	0.33	Small~med.
B3	Water quality improved	898 vs. 112	0.55	0.11	0.45	-3.28	>0.001	***	0.33	Medium
B6	Water shortages have led to discontent	897 vs. 121	0.14	0.28	-0.14	0.99	0.322	n.s.	0.10	Very small

<Final Outcome>

Group: A09_Yes vs. No (1 vs.0)

Analysis method: DID

Question Item	Survey Question in EL	n	D_EL-BL A09=Yes	D_EL-BL A09=No	DID Diff.	t	p	Sig.	Size of difference	Judge.
C1	Mutual Trust	940 vs.125	0.06	-0.23	0.29	-3.26	0.001	***	0.31	Small~Med.
C2	Rely on neighbors	919 vs.121	0.31	0.19	0.12	-0.92	0.360	n.s.	0.09	Very small
C3	Happy to work side by side	930 vs.124	0.12	-0.21	0.33	-2.84	0.005	***	0.27	Small
C4	Happy with child's friends	936 vs.124	0.12	-0.05	0.17	-1.59	0.111	n.s.	0.15	Small
C5	Live well together	928 vs.125	0.00	-0.15	0.16	-1.67	0.095	*	-0.16	Small
C6	They are helpful	921 vs.125	0.11	0.04	0.07	-0.68	0.495	n.s.	-0.06	Very small
C7	Not been treated differently	837 vs.107	-0.06	-0.37	0.31	-3.13	0.002	***	0.32	Small~Med.
C8	Employment led to discontent	933 vs.126	-0.02	-0.02	-0.01	0.08	0.937	n.s.	-0.01	Very small
C9	Feel safe in neighborhood	945 vs.127	-0.16	-0.18	0.02	-0.29	0.776	n.s.	0.03	Small~Med.

Source: IDCJ study team

6-3. Overall Analysis

The Theory of Change was partially confirmed in Analysis 3, a comparison between those who recognized being connected to the new network and those who did not. The initial outcome was observed to have been only partly achieved. While the water pressure improved in the treatment group more than in the control group, the difference in the water shortage was not significant.

Like the before-after comparison of the entire area and Analysis 2 comparing “Hawwara E1+E2” and “Sarieh 4,” the intermediate outcome demonstrated positive differences with higher perceptions of water quantity and quality improvement and overall satisfaction with the public water service in the treatment group. However, while the number of complaints drastically declined in the before-after comparison, this analysis revealed that the respondents in the treatment group made more complaints to YWC than the control group. In relation to this, numerous concerns were raised in FGDs by the people who recognized that they were already connected to the new pipeline that despite the connection work, the water supply did not improve or sometimes even worsened. The reason for such problems is considered to be the ongoing adjustment work behind the scenes, as stated above. As the FGD participants mentioned that they complained to YWC regarding such problems, this could have affected the survey results with greater complaints for the treatment group.

The status of social relations between Syrians and Jordanians was better in the treatment group at the endline (simple comparison) in terms of four of five indicators (mutual trust, attitude accepting diversity, perceived level of equality and discrimination, and feelings of safety). In DID, positive differences were observed in four questions regarding mutual trust, attitude accepting diversity, and perceived level of equality and discrimination. Considering some positive initial and intermediate outcomes, the difficult economic and climate situation (scarcity of water sources) that could adversely affect social relations, and the worsened scores of the control group from the baseline, it can be inferred that the project contributed to preventing social relations between Syrians and Jordanians from worsening in the target area.

7. Conclusion, Recommendations, and Lessons Learned

7-1. Conclusion

This evaluation features JICA’s grant aid project, which aims to promote social stability in northern Jordan through improved quality of and access to water supply services by constructing new water distribution networks and improving the existing networks. The evaluation aimed to answer the following evaluation question: “Has the water service improvement—achieved through the construction of new water distribution networks and improvement of existing networks— contributed to the promotion of social stability between Syrian refugees and their host communities” in Hawwara and Sarieh Districts in Irbid Governorate, Jordan. Baseline and endline surveys were administered for the purpose of this evaluation. Based on the analysis of the survey results, a theory of change (that describes pathways to reach the project goal through project activities) was verified from the initial outcome of improved water quantity, supply time, and pressure, to the intermediate outcome of improved feelings over and perception of water supply, and to the final outcome of improved (or not worsened) social relations.

First, the before-after intervention comparison for the entire project area confirmed outcome achievements at all levels of the pathways to reach the project goal expected in the Theory of Change, though the extent of the change was still modest. The decreasing water level at the water source and timing of the endline survey—that is, when the supply through the new water distribution networks was

still undergoing adjustments and therefore yet to be stabilized—are considered to have affected the mixed improvement in the initial outcome (regarding water quantity, supply time, and water pressure). Nevertheless, the intermediate outcome seemed to be achieved, with the drastically decreased number of complaints to the water service provider, the improved perceptions of water quantity and quality, and the overall satisfaction level. The final outcome of social relations between Syrian refugees and their host communities demonstrated a slight improvement in some psychological indicators while presenting a slight decrease in other indicators as compared to the baseline results, which indicated that the relationship between the two groups was already positive. Considering the difficult economic situation and deteriorating water availability that could have adversely affected the social tension, it can be inferred that the project contributed to the social stability in the target area.

Second, the comparison of the subzones wherein the intervention progressed fastest (set as the treatment group) and those with the least progress as of the period of the endline survey (set as the control group) did not confirm the pathways to reach the project goal expected in the Theory of Change, as only slight changes were observed in the initial and final outcomes despite some positive changes in the intermediate outcome. This is most likely due to the limitation in identifying the treatment and control groups clearly. However, overall, this analysis suggested the effect of water pressure improvement.

Third, by contrast, the comparison of those who recognized being connected to the new network (set as the treatment group) and those who did not (set as the control group) partly confirmed the pathways described in the Theory of Change with some positive results from the initial to final outcome levels. While the initial outcome was evident in terms of the improved water pressure, there was no noticeable difference in the water shortage between the two groups. Nevertheless, the intermediate outcome indicated positive differences, with more respondents in the treatment group perceiving water quantity and quality improvement and being overall satisfied with the public water supply. Furthermore, the final outcome, that is, the status of social relations was better in the treatment group in eight of nine questions (simple comparison as of the endline survey); additionally, there were statistically significant differences in improvement for some indicators between the treatment and control groups (Difference-in-Difference). Therefore, it can be inferred that the project contributed to preventing worsening the social relations in the target area.

In sum, the evaluation results indicate that once the installation and adjustment of the new water distribution networks are fully completed, the positive changes depicted in the evaluation will be enhanced further, and the improved perception regarding the water supply and the resultant positive feelings will contribute to social stability in the target communities. However, it should be noted that the original evaluation design to compare pure treatment and control groups had to be restructured into the above three analyses during the course of the study, owing to the change of the project implementation schedule affected by the COVID-19 pandemic and other reasons.

7-2. Recommendations and Lessons Learned

<For the formulation of future projects that aim for lofty project goals such as peacebuilding>

Peacebuilding, or the improvement of social relations between refugees and the host community in the case of this project, is a lofty goal for an infrastructure project to pursue. While there are many other factors that may influence social relations, it was not clearly stated in the project documents how the project will achieve this goal (in other words, a theory of change that describes pathways to reach the project goal through project activities). Although the evaluation results suggest that the project played its part in maintaining social stability, the extent of contribution was not fully evident, partially owing to the limitation of the evaluation design and the fact that the endline survey was conducted at an early stage, immediately after the intervention, as explained in the Limitation of Analysis and Conclusion above.

If a similar infrastructure project aiming at peacebuilding is formulated in the future, it is recommended that a Theory of Change be clarified at the beginning, ideally with the involvement of the local stakeholders. Through such exercise, synergy effects with other assistance in the target area aiming for peacebuilding can be considered. It is also worth assessing adding considerations more directly related to the goal –promotion of social stability, for instance— to the project design, such as hiring workers from both groups¹⁰, including vocational training aspects in work for both communities, or holding community meetings to explain the true reasons of water scarcity and the project’s approach to solving it (if people attribute the scarcity to the refugee presence). For example, UNHCR is partnering with the government and local municipalities to provide 50% of the employment opportunities to Jordanians and 50% to refugees in some projects (the ratio differs for each project). In this way, such projects may be able to achieve the goal more strongly.

Additionally, this evaluation found that the relationship between the two groups had improved by the time of the baseline survey. To capture the situation of the formulation stage, when there is still tension, it may be more fruitful to conduct a small-scale, simple survey on the social relations in the preparatory study using similar indicators as the final outcome of this evaluation. This may serve as supplementary information to the analysis.

<For future impact evaluation>

Generally speaking, the use of phased intervention (i.e., Hawwara being treated first, then Sariieh being treated later) is a practical method for area-based matched control design in impact evaluation, as it can avoid conflict with people in control groups who may feel neglected. However, this evaluation suggested that the phased intervention may not invariably proceed as planned in the context of developing countries. This evaluation originally aimed at comparing Hawwara and Sariieh project areas (or their subzones, depending on the progress) as the treatment and control groups utilizing the phased intervention schedule of the project. However, due to factors such as COVID-19, the intervention occurred almost simultaneously, and treatment and control groups could not be identified clearly.

¹⁰ According to UNOPS, the contractor followed the government regulation and hired only Jordanians who have social security registration.

Therefore, it is recommended that JICA carefully monitor the situation and provide advice to maintain the phasing of intervention as much as possible. Furthermore, considering this risk, it would be ideal for a similar impact evaluation to identify a control group outside the project area with characteristics similar to the intervention area at the outset. In this way, treatment and control groups can be clearly separated from each other to ensure that comparison between the two is easy. This will also solve the other limitation of the present evaluation: the endline survey being administered when the treatment group had just started receiving the project's benefits to ensure that some households remained in the control group. If a clear control group exists, an endline survey can be administered much later, when the project's benefits become more stable and apparent.

Appendix 1 Detailed Statistical Tables

3 Descriptive Statistics

Source of Water, Other Than Public Network

EL_A-05 In what ways, other than the public network, does your household obtain water? (Multiple choice)

n	Yes	No	Total
1. Buy water from Water Tanker (Public/government)	362	738	1100
2. Buy water from Water Tanker (Private firm)	484	616	1100
3. Buy bottled water (Big bottle, such as 5 - 20 litres)	372	728	1100
4. Buy bottled water (small bottle, such as less than 5 litres)	95	1005	1100
5. Obtain water from private well	294	806	1100
6. Other	5	1095	1100
7. None of the above (No water obtained from sources other than the public network)	97	1003	1100

%	Yes	No	Total
1. Buy water from Water Tanker (Public/government)	33%	67%	100%
2. Buy water from Water Tanker (Private firm)	44%	56%	100%
3. Buy bottled water (Big bottle, such as 5 - 20 litres)	34%	66%	100%
4. Buy bottled water (small bottle, such as less than 5 litres)	9%	91%	100%
5. Obtain water from private well	27%	73%	100%
6. Other	0%	100%	100%
7. None of the above (No water obtained from sources other than the public network)	9%	91%	100%

Demographic Analysis

Baseline

E-1 Your nationality

E-1 Your nationality (H1 in dataset) (n)	Area(H1_50)		Total
	0_Sarieh	1_Hawwara	
1.Jordanian	493	542	1035
2.Syrian	44	23	67
3.Other, specify ()	6	2	8
99. Don't know / Prefer not to answer	0	0	0
N/A	0	1	1
Total	543	568	1111

E-1 Your nationality (H1 in dataset) (%)	Area(H1_50)		Total
	0_Sarieh	1_Hawwara	
1.Jordanian	90.8%	95.4%	93.2%
2.Syrian	8.1%	4.0%	6.0%
3.Other, specify ()	1.1%	0.4%	0.7%
99. Don't know / Prefer not to answer	0.0%	0.0%	0.0%
N/A	0.0%	0.2%	0.1%
Total	100.0%	100.0%	100.0%

Endline

EL_E-1 Your nationality

n	Hawwarah(1)	Sarieh(0)	Total
1.Jordanian	537	472	1,009
2.Syrian	19	68	87
3.Other	2	2	4
	558	542	1,100

%	Hawwarah(1)	Sarieh(0)	Total
1.Jordanian	96%	87%	92%
2.Syrian	3%	13%	8%
3.Other	0%	0%	0%
	100%	100%	100%

E-5 Employment of the family member who earns most

Response	n			%		
	0_Sarieh	1_Hawwara	Total	0_Sarieh	1_Hawwara	Total
E5						
1. Self-employment	94	122	216	17.3%	21.5%	19.4%
2. Hired by private firms/shops/entities (including NGOs and international)	51	49	100	9.4%	8.6%	9.0%
3. Public servant	217	249	466	40.0%	43.8%	41.9%
4. Unemployed	49	76	125	9.0%	13.4%	11.3%
5. Other, specify ()	120	62	182	22.1%	10.9%	16.4%
99. Don't know / Prefer not to answer	12	9	21	2.2%	1.6%	1.9%
NA	0	1	1	0.0%	0.2%	0.1%
Total	543	568	1111	100.0%	100.0%	100.0%

EL_E-5 Employment of the family member who earns most

n	Hawwara(1)	Sarieh(0)	Total
1. Self-employment	142	123	265
2. Hired by private firms/shops/entities (including NGOs and international organizations)	122	114	236
3. Public servant	196	137	333
4. Unemployed	70	78	148
5. Other	85	85	170
99. Don't know / Prefer not to answer			
Total	615	537	1152

%	Hawwara(1)	Sarieh(0)	Total
1. Self-employment	23%	23%	23%
2. Hired by private firms/shops/entities (including NGOs and international organizations)	20%	21%	20%
3. Public servant	32%	26%	29%
4. Unemployed	11%	15%	13%
5. Other	14%	16%	15%
99. Don't know / Prefer not to answer	0%	0%	0%
Total	100%	100%	100%

E-6 Range of total annual income of your household including transfer from families/relatives, etc.

E-6 Range of total annual income (n)	Area(H1_S0)		
	0_Sarieh	1_Hawwara	Total
1. 0 - 5,000 JD	375	442	817
2. 5,001 - 10,000 JD	32	47	79
3. 10,001 - 20,000 JD	3	0	3
4. 20,001 - 50,000 JD	0	0	0
5. More than 50,000JD	0	0	0
99. Don't know / Prefer not to answer	132	79	211
NA	1	0	1
Total	543	568	1111

E-6 Range of total annual income (%)	Area(H1_S0)		
	0_Sarieh	1_Hawwara	Total
1. 0 - 5,000 JD	69.1%	77.8%	73.5%
2. 5,001 - 10,000 JD	5.9%	8.3%	7.1%
3. 10,001 - 20,000 JD	0.6%	0.0%	0.3%
4. 20,001 - 50,000 JD	0.0%	0.0%	0.0%
5. More than 50,000JD	0.0%	0.0%	0.0%
99. Don't know / Prefer not to answer	24.3%	13.9%	0.0%
Total	100.0%	100.0%	100.0%

EL_E-6 Range of total annual income of your household including remittances

n	Hawwara(1)	Sarieh(0)	Total
1. 0 - 1,500 JD	163	206	369
2. 1,501 - 3,000 JD	50	73	123
3. 3,001 - 5,000 JD	64	82	146
4. 5,001 - 10,000 JD	130	62	192
5. 10,001 - 20,000 JD	57	9	66
6. 20,001 - 50,000 JD	1	2	3
7. More than 50,000JD	0	16	16
99. Don't know / Prefer not to answer			0
Total	465	450	915

%	Hawwara(1)	Sarieh(0)	Total
1. 0 - 1,500 JD	35%	46%	40%
2. 1,501 - 3,000 JD	11%	16%	13%
3. 3,001 - 5,000 JD	14%	18%	16%
4. 5,001 - 10,000 JD	28%	14%	21%
5. 10,001 - 20,000 JD	12%	2%	7%
6. 20,001 - 50,000 JD	0%	0%	0%
7. More than 50,000JD	0%	4%	2%
99. Don't know / Prefer not to answer	0%	0%	0%
Total	100%	100%	100%

E-8 The final education level of the head of the household

E-8 The final education level of the head of (n)	Area(H1_S0)		
	0_Sarieh	1_Hawwara	Total
1.No formal education	11	8	19
2. Primary	333	284	617
3. Vocational	0	0	0
4. Secondary	23	38	61
5.University degree	105	200	305
6. Post graduate	44	25	69
7.Other, specify ()	21	6	27
8.Don't know / Prefer not to answer.	0	0	0
NA	6	7	13
Total	543	568	1111

E-8 The final education level of the head of (%)	Area(H1_S0)		
	0_Sarieh	1_Hawwara	Total
1.No formal education	2.0%	1.4%	1.7%
2. Primary	61.3%	50.0%	55.5%
3. Vocational	0.0%	0.0%	0.0%
4. Secondary	4.2%	6.7%	5.5%
5.University degree	19.3%	35.2%	27.5%
6. Post graduate	8.1%	4.4%	6.2%
7.Other, specify ()	3.9%	1.1%	2.4%
8.Don't know / Prefer not to answer.	0.0%	0.0%	0.0%
NA	1.1%	1.2%	1.2%
Total	100.0%	100.0%	100.0%

E-9 Respondent's age

E-9 Respondent's age (%)	Area(H1_S0)		
	0_Sarieh	1_Hawwara	Total
1. Under 20 years old	0.7%	0.0%	0.4%
2. 20-29	9.2%	10.6%	9.9%
3. 30-39	16.6%	14.1%	15.3%
4. 40-49	27.6%	22.7%	25.1%
5. 50-59	25.6%	28.2%	26.9%
6. 60-69	11.8%	16.0%	14.0%
7. Over 70 years old	7.7%	7.0%	7.4%
99.Don't know/ Prefer not to answer	0.7%	1.4%	1.1%
NA	0.0%	0.0%	0.0%
Total	100.0%	100.0%	100.0%

E-10 Respondent's gender

E-10 Respondent's gender (%)	Area(H1_S0)		
	0_Sarieh	1_Hawwara	Total
1. Male	61.7%	78.5%	70.3%
2. Female	36.8%	21.5%	29.0%
Don't know/ Prefer not to answer	1.5%	0.0%	0.7%
Total	100.0%	100.0%	100.0%

EL_E-8 The final education level of the head of the household

n	Hawwara(1)	Sarieh(0)	Total
1.No formal education	12	6	18
2. Primary	69	96	165
3. Vocational	105	68	173
4. Secondary	137	190	327
5.University degree	214	136	350
6. Post graduate	15	36	51
7.Other	5	10	15
99.Don't know / Prefer not to answer			0
Total	557	542	1099

%	Hawwara(1)	Sarieh(0)	Total
1.No formal education	2%	1%	2%
2. Primary	12%	18%	15%
3. Vocational	19%	13%	16%
4. Secondary	25%	35%	30%
5.University degree	38%	25%	32%
6. Post graduate	3%	7%	5%
7.Other	1%	2%	1%
99.Don't know / Prefer not to answer	0%	0%	0%
Total	100%	100%	100%

EL_E-9 Respondent's age

%	Hawwara(1)	Sarieh(0)	Total
1. Under 20 years old	0%	1%	0%
2. 20-29	11%	9%	10%
3. 30-39	25%	21%	23%
4. 40-49	32%	29%	31%
5. 50-59	24%	25%	25%
6. 60-69	7%	10%	9%
7. Over 70 years old	1%	4%	2%
99.Don't know/ Prefer not to answer	0%	0%	0%
Total	100%	100%	100%

EL_E-10 Respondent's gender

%	Hawwara(1)	Sarieh(0)	Total
1. Male	70%	70%	70%
2. Female	30%	30%	30%
Total	100%	100%	100%

4 Analysis 1: Before-After Comparison of the Entire Sample

(1) Initial Outcome

Source of drinking water, cooking water, and water for other household purposes (washing, cleaning, shower, etc.) (A06, A07, A08)

	A06 Drinking						A07 Cooking						A08 Other Household Purposes					
	Baseline			Endline			Baseline			Endline			Baseline			Endline		
	Sarieh	Hawwara	Total	Sarieh	Hawwara	Total	Sarieh	Hawwara	Total	Sarieh	Hawwara	Total	Sarieh	Hawwara	Total	Sarieh	Hawwara	Total
1. Public network	56	77	133	140	102	242	151	263	414	280	332	612	463	537	1,000	513	465	978
2. Bottled water	250	348	598	321	279	600	168	178	346	154	89	243	3	7	10	0	0	0
3. Water tanker	10	3	13	3	6	9	12	2	14	17	18	35	51	2	53	14	17	31
4. Private well	136	108	244	55	165	220	132	105	237	73	119	192	12	5	17	14	76	90
5. Other	88	19	107	21	2	23	76	7	83	16	0	16	12	1	13	1	0	1
Total	540	555	1,095	540	554	1,094	539	555	1,094	540	558	1,098	541	552	1,093	542	558	1,100

Note: Public network includes water direct from tap, after filtering or boiling.

Money Spent to Buy Water Other than the Public Network (A6, A7, A10), Water Tanker Details (A8), Bottled Water Details (A9)

Survey Question in BL / EL	BL avg.	EL avg.	Diff.	t	p-value	Sig.	Effect size	Judge.
A6_How much money (JD) did your household spend to buy water (water tanker, bottled water, etc.) other than the public water service (summer)	20.11	22.78	2.67	-2.64	0.009 ***		0.09	Very small
A7_Last winter, how much money (JD) did your household spend to buy water (water tanker, bottled water, etc.) other than the public water service	14.09	19.47	5.38	-1.53	0.128 n.s.		0.12	Small
A8a_If your household bought water from water tanker last May (2000)/August (2022), how many times?	2.26	2.59	0.33	-0.88	0.379 n.s.		0.03	Very small
tal quantity (m3)	8.06	8	-0.06	0.48	0.969 n.s.		0.00	Very small
tal spending for buying water from water tanker (JD)	18.54	13.97	-4.57	4.3	>0.000 ***		-0.75	Large
A9a_If your household bought bottled water last May (2020)/August (2022), how many times?	10.69	7.18	-3.51	5.26	>0.000 ***		-0.17	Small
tal quantity (litres)	218.67	135.68	-82.99	6.01	>0.000 ***		-0.19	Small
tal spending for buying bottled water (JD)	8.58	11.15	2.57	-2.04	0.042 **		0.07	Very small
A10_The total spending for obtaining water other than the public network last May (2000)/August (2022) increased or decreased compared to one year ago? (5-point Likert scale: 4-Much increased, 0-Much decreased)	2.36	2.34	-0.02	0.44	0.659 n.s.		-0.02	Very small

(2) Intermediate Outcome

Perceived Factors Causing Water Shortage (May 2020) (Baseline survey, the entire area)

B-5 In case your household faced a water shortage/s last May (2020), rank the most important causes (Multiple choice. Maximum 3 choices) (Write 1, 2, 3; 1= most important)

(n)	Possible cause	1st rank	2nd rank	3rd rank	Total
	1 Public water supply is not frequent enough	509	171	57	737
	2 Not enough storage capacity	60	160	72	292
	3 More people joined the household and the water was not enough for everyone	29	50	70	149
	4 Cannot afford to buy water from water shops and water tankers	34	82	115	231
	5 Due to population influx in the area, the water was not enough for everyone	37	156	161	354
	6 Private water vendors cannot be trusted	0	0	24	24
	7 The private well dried up	6	7	7	20
	8 The water flow/pressure (pumped through pipes) is weak	206	238	201	645
	9 None of the above	99	47	115	261
	98 other: _____	19	152	97	268
	99 Don't know / Prefer not to answer.	112	48	192	352
	97 My family did not face any water shortages go to question B-7				
	Total	1111	1111	1111	3333

(%)	Possible cause	1st rank	2nd rank	3rd rank	Total
	1 Public water supply is not frequent enough	45.8%	15.4%	5.1%	22.1%
	2 Not enough storage capacity	5.4%	14.4%	6.5%	9%
	3 More people joined the household and the water was not enough for everyone	2.6%	4.5%	6.3%	4%
	4 Cannot afford to buy water from water shops and water tankers	3.1%	7.4%	10.4%	7%
	5 Due to population influx in the area, the water was not enough for everyone	3.3%	14.0%	14.5%	10.6%
	6 Private water vendors cannot be trusted	0.0%	0.0%	2.2%	1%
	7 The private well dried up	0.5%	0.6%	0.6%	1%
	8 The water flow/pressure (pumped through pipes) is weak	18.5%	21.4%	18.1%	19.4%
	9 None of the above	8.9%	4.2%	10.4%	8%
	98 other: _____	1.7%	13.7%	8.7%	8%
	99 Don't know / Prefer not to answer.	10.1%	4.3%	17.3%	10.6%
	97 My family did not face any water shortages go to question B-7	0.0%	0.0%	0.0%	0%
	Total	100.0%	100.0%	100.0%	100%

Perceived Factors Causing Water Shortage (May 2020) (Baseline survey, Jordanian and Syrian)

BL_B-5 In case your household faced a water shortage/s last May (2020), rank the most important causes (Multiple choice. Maximum 3 choices) (Write 1, 2, 3; 1= most important)

Possible cause	Jordanian(BL_E1=1)			
	n			
	Most important <-----			
	1	2	3	Total
1 Public water supply is not frequent enough	474	166	55	695
2 Not enough storage capacity	55	146	67	268
3 More people joined the household and the water was not enough for everyone	25	46	64	135
4 Cannot afford to buy water from water shops and water tankers	30	79	108	217
5 Due to population influx in the area, the water was not enough for everyone	35	146	156	337
6 Private water vendors cannot be trusted	0	0	21	21
7 The private well dried up	6	6	7	19
8 The water flow/pressure (pumped through pipes) is weak	199	218	186	603
9 None of the above	83	40	105	228
98 other:	14	136	86	236
99 Don't know / Prefer not to answer.				
97 My family did not face any water shortages go to question B-7				
Total	921	983	855	2759

Possible cause	Syrian((BL_E1=2)			
	n			
	Most important <-----			
	1	2	3	Total
1 Public water supply is not frequent enough	28	3	2	33
2 Not enough storage capacity	4	10	4	18
3 More people joined the household and the water was not enough for everyone	3	4	5	12
4 Cannot afford to buy water from water shops and water tankers	3	3	7	13
5 Due to population influx in the area, the water was not enough for everyone	1	7	4	12
6 Private water vendors cannot be trusted	0	0	3	3
7 The private well dried up	0	1	0	1
8 The water flow/pressure (pumped through pipes) is weak	4	15	10	29
9 None of the above	12	6	7	25
98 other:	5	11	7	23
99 Don't know / Prefer not to answer.				
97 My family did not face any water shortages go to question B-7				
Total	60	60	49	169

Possible cause	%			
	Most important <-----			
	No.1	No.2	No.3	Total
1 Public water supply is not frequent enough	51%	17%	6%	25%
2 Not enough storage capacity	6%	15%	8%	10%
3 More people joined the household and the water was not enough for everyone	3%	5%	7%	5%
4 Cannot afford to buy water from water shops and water tankers	3%	8%	13%	8%
5 Due to population influx in the area, the water was not enough for everyone	4%	15%	18%	12%
6 Private water vendors cannot be trusted	0%	0%	2%	1%
7 The private well dried up	1%	1%	1%	1%
8 The water flow/pressure (pumped through pipes) is weak	22%	22%	22%	22%
9 None of the above	9%	4%	12%	8%
98 other	2%	14%	10%	9%
99 Don't know / Prefer not to answer.				
97 My family did not face any water shortages go to question B-7				
Total	100%	100%	100%	100%

Possible cause	%			
	Most important <-----			
	No.1	No.2	No.3	Total
1 Public water supply is not frequent enough	47%	5%	4%	20%
2 Not enough storage capacity	7%	17%	8%	11%
3 More people joined the household and the water was not enough for everyone	5%	7%	10%	7%
4 Cannot afford to buy water from water shops and water tankers	5%	5%	14%	8%
5 Due to population influx in the area, the water was not enough for everyone	2%	12%	8%	7%
6 Private water vendors cannot be trusted	0%	0%	6%	2%
7 The private well dried up	0%	2%	0%	1%
8 The water flow/pressure (pumped through pipes) is weak	7%	25%	20%	17%
9 None of the above	20%	10%	14%	15%
98 other	8%	18%	14%	14%
99 Don't know / Prefer not to answer.				
97 My family did not face any water shortages go to question B-7				
Total	100%	100%	100%	100%

Perceived Factors Causing Water Shortage (August 2022) (Endline survey, Jordanian and Syrian)

EL_B-5 In case your household faced a water shortage/s last August (2022), rank the most important causes (Multiple choice. Maximum 3 choices) (Write 1, 2, 3; 1= most important)

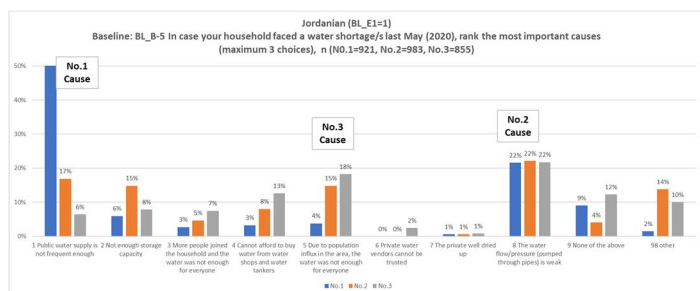
Cause	Jordanian(EL_E1=1)			
	n			
	Most important <-----			
	1	2	3	Total
1 Public water supply is not frequent enough	321	117	74	512
2 Not enough storage capacity	121	182	113	416
3 More people joined the household and the water was not enough for everyone	131	88	97	316
4 Cannot afford to buy water from water shops and water tankers	68	108	108	284
5 Due to population influx in the area, the water was not enough for everyone	60	134	93	287
6 Private water vendors cannot be trusted	27	60	94	181
7 The private well dried up	9	14	22	45
8 The water flow/pressure (pumped through pipes) is weak	147	156	200	503
9 None of the above	100	50	82	232
98 other:	3	22	2	27
99 Don't know / Prefer not to answer.				
97 My family did not face any water shortages go to question B-7				
Total	987	931	885	2803

Cause	Syrian((EL_E1=2)			
	n			
	Most important <-----			
	1	2	3	Total
1 Public water supply is not frequent enough	41	13	1	55
2 Not enough storage capacity	7	13	7	27
3 More people joined the household and the water was not enough for everyone	7	5	8	20
4 Cannot afford to buy water from water shops and water tankers	6	5	10	21
5 Due to population influx in the area, the water was not enough for everyone	4	9	4	17
6 Private water vendors cannot be trusted	2	7	3	12
7 The private well dried up	0	0	1	1
8 The water flow/pressure (pumped through pipes) is weak	9	21	23	53
9 None of the above	11	2	14	27
98 other:	0	4	0	4
99 Don't know / Prefer not to answer.				
97 My family did not face any water shortages go to question B-7				
Total	87	79	71	237

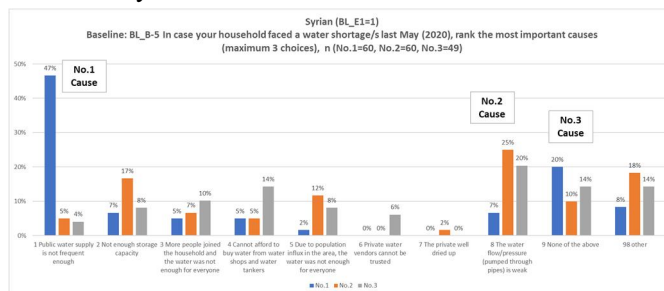
Cause	%			
	Most important <-----			
	No.1	No.2	No.3	Total
1 Public water supply is not frequent enough	33%	13%	8%	18%
2 Not enough storage capacity	12%	20%	13%	15%
3 More people joined the household and the water was not enough for everyone	13%	9%	11%	11%
4 Cannot afford to buy water from water shops and water tankers	7%	12%	12%	10%
5 Due to population influx in the area, the water was not enough for everyone	6%	14%	11%	10%
6 Private water vendors cannot be trusted	3%	6%	11%	6%
7 The private well dried up	1%	2%	2%	2%
8 The water flow/pressure (pumped through pipes) is weak	15%	17%	23%	18%
9 None of the above	10%	5%	9%	8%
98 other	0%	2%	0%	1%
99 Don't know / Prefer not to answer.				
97 My family did not face any water shortages go to question B-7				
Total	100%	100%	100%	100%

Cause	%			
	Most important <-----			
	No.1	No.2	No.3	Total
1 Public water supply is not frequent enough	47%	16%	1%	23%
2 Not enough storage capacity	8%	16%	10%	11%
3 More people joined the household and the water was not enough for everyone	8%	6%	11%	8%
4 Cannot afford to buy water from water shops and water tankers	7%	6%	14%	9%
5 Due to population influx in the area, the water was not enough for everyone	5%	11%	6%	7%
6 Private water vendors cannot be trusted	2%	9%	4%	5%
7 The private well dried up	0%	0%	1%	0%
8 The water flow/pressure (pumped through pipes) is weak	10%	27%	32%	22%
9 None of the above	13%	3%	20%	11%
98 other	0%	5%	0%	2%
99 Don't know / Prefer not to answer.				
97 My family did not face any water shortages go to question B-7				
Total	100%	100%	100%	100%

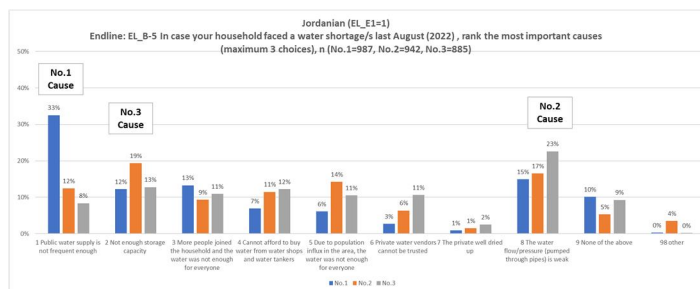
Baseline: Jordanian



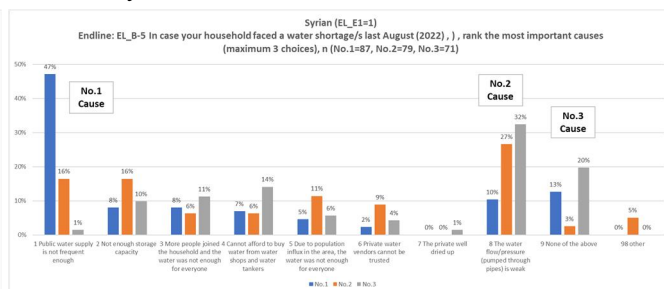
Baseline: Syrian



Endline: Jordanian



Endline: Syrian



(3) Final Outcome

Final Outcome: Comparison between Jordanian and Syrian in each survey

Final Outcome

<Sample: Jordanian-Syrian>

Question items		n	Jordanian (1)	Syrian (2)	Diff.	SE	t	p	sig.	Effect Size	Judge.
C1_Mutual trust	Baseline	1020 vs. 65	3.10	2.85	-0.25	0.10	2.64	>0.01	***	-0.332	Small-Med.
	Endline	1001 vs. 87	3.12	3.09	-0.026	0.07	0.37	0.71	n.s.	-0.043	Very small
C2_Rely on neighbor	Baseline	997 vs.63	2.47	2.9	0.43	0.13	-3.22	>0.01	***	0.413	Medium
	Endline	1000 vs.87	2.81	2.84	0.03	0.1	-0.27	>0.78	n.s.	0.033	Very small
C3_Happy to work side by side	Baseline	1010 vs. 65	2.72	2.97	0.25	0.11	-2.34	0.02	**	0.303	Small-Med.
	Endline	1002 vs.87	2.81	3.00	0.19	0.09	-1.93	0.05	*	0.224	Small
C4_Happy with child's friends (diversity)	Baseline	1016 vs.65	2.77	3.03	0.26	0.10	-2.49	0.01	**	0.318	Small-Med.
	Endline	1001 vs.86	2.89	3.02	0.13	0.08	-1.55	0.12	n.s.	0.173	Small
C5_Live well together	Baseline	1013 vs.65	2.95	3.03	0.08	0.09	-0.85	0.40	n.s.	-0.113	Small
	Endline	997 vs. 86	2.93	3.08	0.15	0.07	-2.11	0.04	**	-0.235	Small
C6_They are helpful	Baseline	1003 vs.65	2.86	2.97	0.11	0.10	-1.17	0.24	n.s.	0.145	Small
	Endline	998 v.s.87	2.96	3.09	0.13	0.08	-1.74	0.08	*	0.189	Small
C7_Not been treated differently	Baseline	905 vs.65	3.05	2.91	-0.140	0.09	1.47	0.14	n.s.	-0.191	Small
	Endline	988 vs.87	2.94	2.94	0.004	0.08	-0.06	0.95	n.s.	0.007	Very small
C8_Employment led to discontent	Baseline	1017 vs.63	3.14	3.06	-0.080	0.10	0.76	0.45	n.s.	-0.104	Small
	Endline	1001 vs.86	3.1	3.19	0.09	0.08	-1.12	0.26	n.s.	0.128	Small
C9_Feel safe in neighborhood	Baseline	1021 vs.65	3.26	3.20	-0.06	0.09	0.68	0.50	n.s.	-0.088	Very Small
	Endline	1007 vs.87	3.11	3.10	-0.01	0.07	0.04	0.97	n.s.	-0.011	Very Small

5 Analysis 2: Comparison between the Treatment (Hawwara E1 and E2) and the Control Groups (Sarieh 4)

Balance Check: Analysis 2 (Hawwara E1+E2 vs. Sarieh 4)

Balance Check between Sarieh4 vs. HawwaraE1+E2

Two-group t-test was applied except Section E where chi-squared test applied.

By EL_I5Subzone_01	Sample size	0(Sarieh4)	1(Hawwara E1+E2)	Diff.	SE	t	p	Sig.
BL_A01 Water shortage last May (2020) ?	160vs114	0.475	0.850	-0.375	0.055	6.86	>0.000	***
BL_A01a If yes, # days?	76vs97	4.132	8.680	-4.548	1.790	2.54	0.012	**
BL_A02 Water shortage last winter (Dec-Feb) ?	159vs114	0.138	0.184	-0.046	0.045	1.024	0.307	n.s.
BL_A02a If yes, # days?	22vs21	4.954	3.905	1.049	1.241	0.846	0.403	n.s.
BL_A03 Connected to public water network?	168vs116	0.946	0.983	-0.037	0.023	1.561	0.120	n.s.
BL_A04 Size of water tank ?	169vs116	8.05	4.40	3.650	1.577	2.314	0.021	**
BL_A051 Buy water from Water Tanker (gov.)?	169vs116	0.805	0.724	0.081	0.051	1.595	0.112	n.s.
BL_A052 Buy water from Water Tanker (private)?	169vs116	0.58	0.353	0.227	0.059	3.840	>0.000	***
BL_A053 Buy bottled water (5-20litres)?	169vs116	0.538	0.750	-0.212	0.057	3.697	>0.000	***
BL_A054 Buy bottled water (less than 5 litres)?	169vs116	0.923	0.905	0.018	0.0336	0.533	0.594	n.s.
BL_A055 Obtain water from private well	169vs116	0.604	0.655	-0.052	0.0585	0.8823	0.378	n.s.
BL_A056 Other	169vs116	0.882	1.000	-0.118	0.0301	3.932	>0.000	***
BL_A057 None of the above (only from public ntwk)	169vs116	0.923	0.888	0.035	0.348	1.011	0.313	n.s.
BL_A2a Water shortage from public ntwk last May (2020) ?	156vs115	0.487	0.852	-0.365	0.548	6.662	>0.000	***
BL_A3a Water shortage from public ntwk last winter (Dec-Feb) ?	155vs114	0.129	0.175	-0.046	0.044	1.055	0.292	n.s.
BL_A4a Water pressure from public ntwk over last month?	152vs113	1.559	1.876	-0.317	0.162	1.951	0.052	*
BL_A5 Accuracy of public ntwk over last month?	154vs116	2.519	3.060	-0.541	0.139	3.877	>0.000	***
BL_A10 Total money spent for water other than public ntwk?	156vs104	2.346	2.288	0.058	0.094	0.613	0.541	n.s.
BL_B1 How many complaints to YWC?	162vs115	2.062	2.243	-0.182	0.538	-0.338	0.736	n.s.
BL_B2 Quantity of water supply ?	150vs116	1.933	1.879	0.540	0.111	0.486	0.628	n.s.
BL_B3 Quality of water supply ?	153vs112	2.026	1.821	0.205	0.096	2.122	0.035	**
BL_B4 Satisfied with public water supply?	161vs114	0.404	0.272	0.132	0.058	2.272	0.024	**
BL_B6 Water shortage led to discontent within community?	160vs111	2.881	3.378	-0.497	0.133	-3.744	>0.000	***
BL_B7 Aware JICA/UNOPS?	165vs115	0.188	0.522	-0.334	0.053	-6.243	>0.000	***
BL_C1 Mutual trust:Trust neighbors	167vs116	2.976	3.043	-0.067	0.1	-0.67	0.503	n.s.
BL_C2 Mutual trust: Rely on my Syrian/Jordanian neighbor	157vs113	2.395	2.442	-0.048	0.136	-0.349	0.727	n.s.
BL_C3 Attitude to diversity: Happy to work side by side	164vs115	2.683	2.696	-0.013	0.11	-0.115	0.908	n.s.
BL_C4 Attitude to diversity: Happy for my children to have friends	165vs115	2.715	2.774	-0.588	0.105	-0.562	0.574	n.s.
BL_C5 Attitude to diversity: Different nationality live well together	164vs115	2.963	2.904	0.059	0.092	0.636	0.526	n.s.
BL_C6 Equality: Helpful to Syrian/Joradnians	163vs115	2.828	2.800	0.028	0.095	0.296	0.768	n.s.
BL_C7 Equality: Not been discriminated	125vs116	2.976	2.966	0.011	0.096	0.109	0.913	n.s.
BL_C8 Social puessure: Employment situation led to discontent	165vs116	3.127	3.103	0.024	0.096	0.248	0.804	n.s.
BL_C9 Safety: Feel safe in my neighborhood	167vs117	3.251	3.310	-0.059	0.0817	-0.721	0.472	n.s.
BL_D1 Increase/decrease water use because of COVID19	168vs116	2.708	3.138	-0.430	0.097	-4.424	>0.000	***
BL_E1 Nationality	169vs116	-	-	-	-	x2-value	0.613	n.s.
BL_E3 Number of family members	169vs116	6.142	5.707	0.435	0.338	1.288	0.199	n.s.
BL_E4 Type of residence	169vs116	-	-	-	-	x2-value	0.416	n.s.
BL_E5 Employment of family members	169vs116	-	-	-	-	x2-value	0.067	*
BL_E6 Range of total annual income of your family	168vs116	-	-	-	-	x2-value	0.007	***
BL_E7 Gender of the head of the household	169vs116	-	-	-	-	x2-value	0.229	n.s.
BL_E8 Final education level of the head of the household	169vs116	-	-	-	-	x2-value	0.001	***
BL_E9 Respondent's age	169vs116	-	-	-	-	x2-value	0.392	n.s.
BL_E10 Respondent's gender	169vs116	-	-	-	-	x2-value	0.068	*

6 Analysis 3: Comparison between the Treatment (Households Recognizing New Connection) and the Control Groups (Households Recognizing No New Connection)

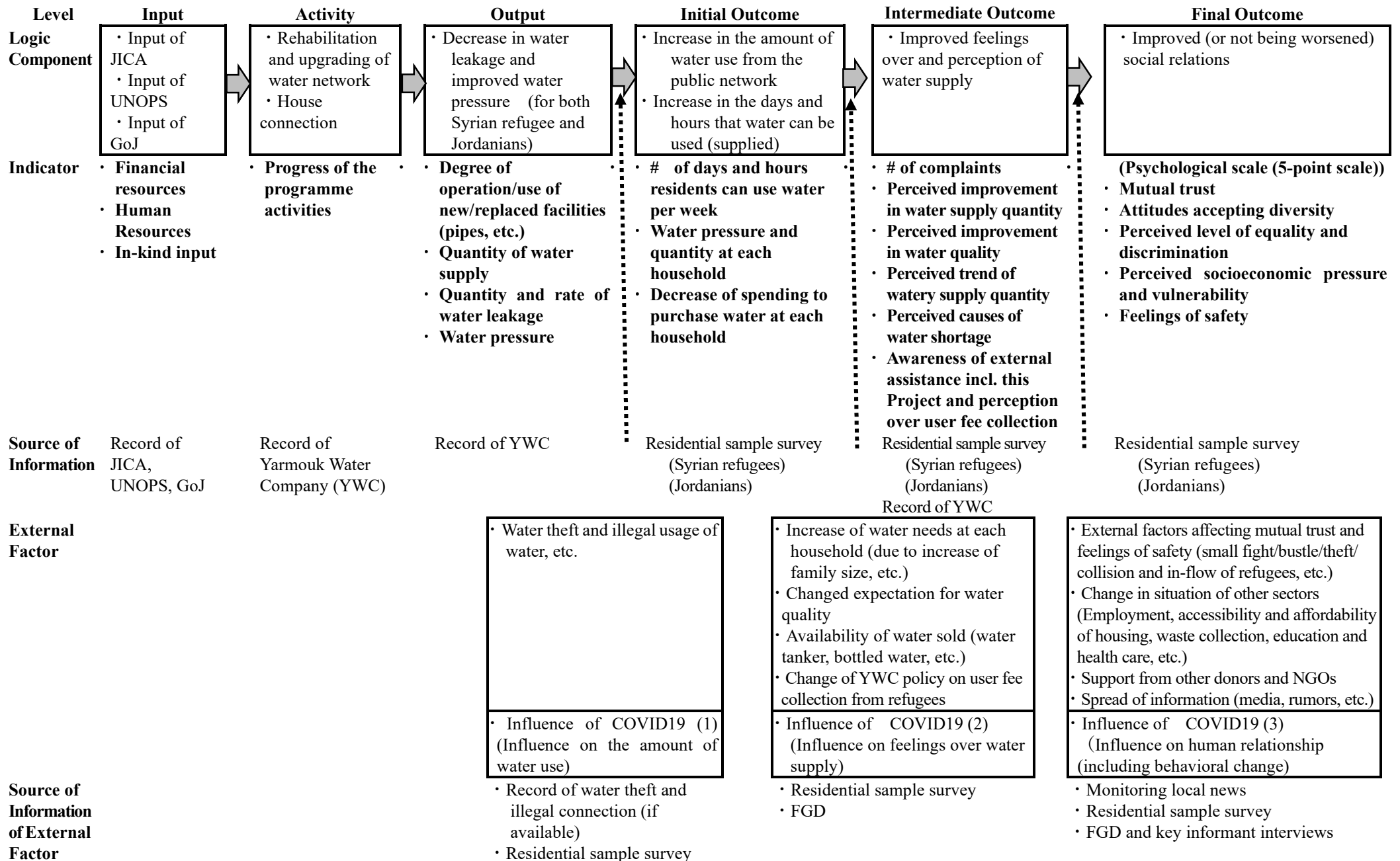
Balance Check: Analysis 3 (Connection to the newly installed/replaced public network)

Balance Check between "No" vs. "Yes" to connection to the newly installed/replaced public network as of the endline survey

Two-group t-test was applied except Section E where chi-squared test applied.

By EL_I5Subzone_01	Sample size	"No"	"Yes"	Diff.	SE	t	p	Sig.
BL_A01 Water shortage last May (2020) ?	126vs929	0.571	0.609	-0.038	0.046	-0.815	0.416	n.s.
BL_A01a If yes, # days?	72vs565	8.222	6.212	2.010	1.127	1.784	0.075	*
BL_A02 Water shortage last winter (Dec-Feb) ?	126vs927	0.206	0.165	0.041	0.036	1.158	0.247	n.s.
BL_A02a If yes, # days?	25vs150	5.040	6.127	-1.087	1.654	-0.657	0.512	n.s.
BL_A03 Connected to public water network?	129vs949	0.984	0.968	0.016	0.016	1.011	0.312	n.s.
BL_A04 Size of water tank ?	129vs949	6.054	5.783	0.271	0.946	0.287	0.774	n.s.
BL_A051 Buy water from Water Tanker (gov.)?	129vs949	0.829	0.818	0.011	0.036	0.325	0.745	n.s.
BL_A052 Buy water from Water Tanker (private)?	129vs949	0.543	0.507	0.036	0.047	0.764	0.446	n.s.
BL_A053 Buy bottled water (5-20litres)?	129vs949	0.643	0.654	-0.011	0.045	-0.245	0.806	n.s.
BL_A054 Buy bottled water (less than 5 litres)?	129vs949	0.907	0.919	-0.119	0.026	-0.460	0.646	n.s.
BL_A055 Obtain water from private well	129vs949	0.643	0.726	-0.083	0.042	-1.954	0.051	*
BL_A056 Other	129vs949	0.915	0.929	-0.015	0.024	-0.603	0.547	n.s.
BL_A057 None of the above (only from public ntwk)	129vs950	0.899	0.898	0.001	0.028	0.047	0.963	n.s.
BL_A2a Water shortage from public ntwk last May (2020) ?	122vs923	0.549	0.587	-0.038	0.048	-0.8	0.424	n.s.
BL_A3a Water shortage from public ntwk last winter (Dec-Feb) ?	123vs916	0.22	0.167	0.052	0.036	1.444	0.149	n.s.
BL_A4a Water pressure from public ntwk over last month?	118vs906	1.975	1.850	0.125	0.122	1.019	0.309	n.s.
BL_A5 Accuracy of public ntwk over last month?	124vs920	2.734	2.812	-0.078	0.101	-0.776	0.438	n.s.
BL_A10 Total money spent for water other than public ntwk?	122vs903	2.328	2.353	-0.025	0.073	-0.346	0.729	n.s.
BL_B1 How many complaints to YWC?	126vs910	2.563	2.543	0.021	0.548	0.038	0.97	n.s.
BL_B2 Quantity of water supply ?	119vs895	1.916	1.831	0.085	0.098	0.863	0.389	n.s.
BL_B3 Quality of water supply ?	122vs900	1.934	1.787	0.148	0.09	1.645	0.1003	n.s.
BL_B4 Satisfied with public water supply?	127vs921	0.465	0.376	0.089	0.46	1.93	0.054	*
BL_B6 Water shortage led to discontent within community?	125vs920	2.84	2.937	-0.097	0.113	-0.859	0.39	n.s.
BL_B7 Aware JICA/UNOPS?	127vs940	0.339	0.377	-0.038	0.046	-0.831	0.406	n.s.
BL_C1 Mutual trust: Trust neighbors	128vs945	3.156	3.084	0.073	0.071	1.026	0.305	n.s.
BL_C2 Mutual trust: Rely on my Syrian/Jordanian neighbor	125vs923	2.504	2.509	-0.005	0.099	-0.052	0.958	n.s.
BL_C3 Attitude to diversity: Happy to work side by side	128vs935	2.695	2.760	-0.065	0.077	-0.845	0.398	n.s.
BL_C4 Attitude to diversity: Happy for my children to have friends	128vs941	2.781	2.797	-0.016	0.077	-0.205	0.838	n.s.
BL_C5 Attitude to diversity: Different nationality live well together	128vs938	2.922	2.971	-0.049	0.067	-0.74	0.46	n.s.
BL_C6 Equality: Helpful to Syrian/Jordanians	126vs931	2.81	2.879	-0.069	0.072	-0.965	0.335	n.s.
BL_C7 Equality: Not been discriminated	110vs851	3.018	3.046	-0.028	0.074	-0.373	0.709	n.s.
BL_C8 Social pressure: Employment situation led to discontent	127vs941	3.031	3.155	-0.124	0.073	-1.703	0.089	*
BL_C9 Safety: Feel safe in my neighborhood	128vs946	3.172	3.277	-0.105	0.064	-1.644	0.1004	n.s.
BL_D1 Increase/decrease water use because of COVID19	128vs945	2.695	2.825	-0.130	0.081	-1.601	0.11	n.s.
BL_E1 Nationality	129vs950	-	-	-	-	x2-value	0.989	n.s.
BL_E3 Number of family members	129vs949	6.194	5.706	0.488	0.233	2.091	0.037	**
BL_E4 Type of residence	129vs950	-	-	-	-	x2-value	0.806	n.s.
BL_E5 Employment of family members	129vs950	-	-	-	-	x2-value	0.719	n.s.
BL_E6 Range of total annual income of your family	129vs950	-	-	-	-	x2-value	0.918	n.s.
BL_E7 Gender of the head of the household	129vs951	-	-	-	-	x2-value	0.808	n.s.
BL_E8 Final education level of the head of the household	129vs951	-	-	-	-	x2-value	0.165	n.s.
BL_E9 Respondent's age	129vs951	-	-	-	-	x2-value	0.876	n.s.
BL_E10 Respondent's gender	129vs951	-	-	-	-	x2-value	0.216	n.s.

Appendix 2 Theory of Change (Detailed Version)



Appendix 3 Survey Questionnaires (Baseline and Endline) ¹¹

1. Baseline Survey

Households Sample Survey Questionnaire

About this survey

1. The Programme for Urgent Improvement of Water Sector for the Host Communities of Syrian Refugees in Northern Governorates (Phase 2) is implemented by UNOPS in accordance with the Grant Agreement with JICA. The programme aims to promote social stability in Jordan through the improved quality of, and access to water supply services for Jordanian residents in the Hawwara and Sarih Districts, as well as for the Syrian refugees in the host communities and the surrounding areas, through the construction of new water distribution networks, in addition to improving the existing ones.
2. This survey evaluates the impact of the programme on the social stability in the target districts. The purpose of the survey is to extract recommendations, lessons learned, and feedback for JICA that can be utilized in its future assistance to refugees and host communities.
3. All information collected in this survey will be treated confidentially. The results will be made available to statistical analysis, but individual (persona) information will not be identified. Please feel free to express your feelings and opinions. Thank you for contributing valuable time to take this survey.

About this questionnaire

1. This survey questionnaire should be answered by an adult member of the responding household, but head of household is preferred.
2. Enumerator will circle the number of the applicable answer. The example of circling the answer is shown below.

Example - Over the past month, how often did you receive water from the public network?

1. Every day
2. Three times a week
3. Twice a week
4. Once a week
5. Once every two weeks
6. Once a month
7. Never
99. Don't know / Prefer not to answer

¹¹ In the analysis, the values assigned for each item were converted to a reversed order as follows. Five-point Likert scale: 1-2-3-4-5 to 4-3-2-1-0. Binomial scale: Yes (1) – (No) 2 to Yes (1) – No (0).

Section A. Initial Outcome

<Logic component>

- Increase in the amount of water use from the public network
- Increase in the days and hours that water can be used (supplied)

<Indicators>

- # of days and hours residents can use water per week
- Water pressure and quantity at each household
- Decrease of spending to purchase water at each household

A-01 Have you ever faced a water shortage in general (regardless of the public network or other source) last May (2020)¹²?

If yes, how many days?

1. Yes → ___ # days
2. No
99. Don't know / Prefer not to answer

A-02 Last winter (December – February), did you face a water shortage in general (regardless of the public network or other source)?

If yes, how many times?

1. Yes → ___ # of times
2. No
99. Don't know / Prefer not to answer

A-03 Is your house/residence connected to the public water network?

1. Yes -> Since when? () (e.g.) If the answer is April 2020, write 202004.
- 2.No
99. Don't know / Prefer not to answer

A-04 What is the size of the water tank of your household and where is it located?

Size () m³ (If there are more than one tank, add them up).

- Location
1. Rooftop
 2. Basement
 3. On the ground
 4. There is no tank
 5. Other, please specify ()
 99. Don't know / Prefer not to answer

A-05 In what ways, other than the public network, does your household obtain water? (Multiple choice)

1. Buy water from Water Tanker (Public/government)
2. Buy water from Water Tanker (Private company)
3. Buy bottled water (Big bottle, such as 5 - 20 litres)
4. Buy bottled water (small bottle, such as less than 5 litres)
5. Obtain water from private well
6. Other, please specify ()
7. None of the above (No water obtained from sources other than the public network)

¹² Some of the buildings in the target area were already connected to the water pipes installed by the intervention (Project) since June 2020 even without the additional component (house connection renewal/installation) of the Project. That's why we ask about the situation in May 2020 to the whole sample households.

A-06 What water source does your household mainly use for Drinking Water ? and if the answer is other than the public network, what is the reason? (single answer)

1. Public network (direct from tap, after filtering or boiling)
2. Bottled water
3. Water tanker
4. Water from private well
5. Other, please specify ()
99. Don't know / Prefer not to answer

- If the answer is 2.-5., the reason →
1. Not enough water from the public network
 2. The public water quality is not acceptable
 3. Not connected to the public network
 4. Other, please specify ()

A-07 What water source does your household mainly use for Cooking ? and if the answer is other than the public network, what is the reason? (single answer)

1. Public network (direct from tap, after filtering or boiling)
2. Bottled water
3. Water tanker
4. Water from private well
5. Other, please specify ()
99. Don't know / Prefer not to answer

- If the answer is 2.-5., the reason →
1. Not enough water from the public network
 2. The public water quality is not acceptable
 3. Not connected to the public network
 4. Other, please specify ()

A-08 What water source does your household mainly use for Other Household Purposes (Washing, Cleaning, Shower, etc.) ? and if the answer is other than the public network, what is the reason? (single answer)

1. Public network (direct from tap, after filtering or boiling)
2. Bottled water
3. Water tanker
4. Water from private well
5. Other, please specify ()
99. Don't know / Prefer not to answer

- If the answer is 2.-5., the reason →
1. Not enough water from the public network
 2. The public water quality is not acceptable
 3. Not connected to the public network
 4. Other, please specify ()

A-1 Last May (2020), how often did you receive water from the public network and how many hours did the supply continue each time?

1. Every day
2. Every other days
3. Once every three days
4. Once every four days
5. Once every five days
6. Once every six days
7. Once a week
8. Once every two weeks

- 9. Never
- 10. Other, please specify ()
- 99. Don't know / Prefer not to answer

The length of supply each time → _____ # hours

A-2 Have you ever faced a water shortage from the public network last May (2020)?
If yes, how many days?

- 1. Yes → _____ # days
- 2. No
- 99. Don't know / Prefer not to answer

A-3 Last winter (December – February), did you face a water shortage from the public network?
If yes, how many times?

- 1. Yes → _____ # of times
- 2. No
- 99. Don't know/ Prefer not to answer.

A-4 Over the past month, how was the water pressure your household received from the public network (when water is available)?

- 1. Always strong
- 2. Almost always strong
- 3. Sometimes strong and sometimes weak
- 4. Almost always weak
- 5. Always weak
- 6. Water was never available
- 99. Don't know / Prefer not to answer

A-5 How accurate is the public network water distribution schedule announced by YWC?

- 1. Very accurate (The water is always supplied as scheduled)
- 2. Almost always accurate
- 3. Sometimes accurate and sometimes inaccurate
- 4. Almost always inaccurate
- 5. Very inaccurate (The water is never supplied as scheduled)
- 99. Don't know / Prefer not to answer

A-6 How much money (JD) did your household spend to buy water (water tanker, bottled water, etc.) other than the public water service last May (2020)? If you pay with another currency, please answer the currency and amount. (Multiple choice)

- 1. JD ()
- 2. Currency & amount ()
- 3. Don't know / Prefer not to answer

A-7 Last winter (December – February), how much money (JD) did your household spend to buy water (water tanker, bottled water, etc.) other than the public water service per one month? If you pay with another currency, please answer the currency and amount. (Multiple choice)

- 1. JD ()
- 2. Currency & amount ()

3. Don't know / Prefer not to answer

A-8 If your household bought water from water tanker last May (2020), how many times and how much quantity did you buy and how much money (JD) did you spend for it? If you pay with another currency, please answer the currency and amount.

How many times you bought: () times
Total quantity you bought: () m³
Total spending for buying water from water tanker ()JD
If you pay with another currency, please specify ().

A-9 If your household bought bottled water last May (2020), how many times and how much quantity did you buy and how much money (JD) did you spend for it? If you pay with another currency, please answer the currency and amount.

How many times you bought: () times
Total quantity you bought: () litres
Total spending for buying bottled water ()JD
If you pay with another currency, please specify ().

A-10 Did the total money your household spent for obtaining water from sources other than the public network last May (2020) increase or decrease compared to the same month of last year?

1. Much Increased
2. Increased by some degree
3. Same or almost same
4. Decreased by some degree
5. Much decreased
99. Don't know / Prefer not to answer

Section B. Intermediate Outcome

<Logic component>

- Improved feelings over and perception on water supply

<Indicators>

- # of complaints
- Perceived improvement in water supply quantity
- Perceived improvement in water quality
- Perceived trend of watery supply quantity
- Perceived factors influencing water shortage
- Awareness of external assistance incl. this Project and perception over user fee collection

B-1 How many times have you made complaints to the YWC about water supply or water quality last May (2020)?

() times
99. Don't know / Prefer not to answer

B-2 To what extent has the quantity of water supply been improved or deteriorated in your community/neighborhood compared between last May (2020) and one year ago?

1. Much improving
2. Improving
3. No change
4. Deteriorating
5. Much deteriorating

99. Don't know / Prefer not to answer

B-3 To what extent has the water quality improved or deteriorated in your community/ neighborhood compared between last May (2020) and one year ago?

- 1. Much improving
- 2. Improving
- 3. No change
- 4. Deteriorating
- 5. Much deteriorating
- 99. Don't know / Prefer not to answer

B-4 Overall, are you satisfied with the public water supply?

- 1. Yes, satisfied
- 2. No, not satisfied
- 99. Don't know / Prefer not to answer

B-5 In case your household faced a water shortage/s last May (2020), rank the most important causes (Multiple choice. Maximum 3 choices) (Write 1, 2, 3; 1= most important)

Rank (Max 3 answers. 1=most important)	Possible cause
	1 Public water supply is not frequent enough
	2 Not enough storage capacity
	3 More people joined the household and the water was not enough for everyone
	4 Cannot afford to buy water from water shops and water tankers
	5 Due to population influx in the area, the water was not enough for everyone
	6 Private water vendors cannot be trusted
	7 The private well dried up
	8 The water flow/pressure (pumped through pipes) is weak
	9 None of the above
	98 other: _____
	99 Don't know / Prefer not to answer.
	97 My family did not face any water shortages → go to question B-7

B-6 To what extent have the water shortages led to discontent within your community/ neighborhood?

- 1. Very much
- 2. By some degree
- 3. More or less
- 4. Almost no
- 5. Never at all.
- 99. Don't know / Prefer not to answer

B-7 Were you aware that JICA and UNOPS have supported this Project to improve water supply in your community/ neighborhood?

- 1. Yes

- 2. No
- 99. Prefer not to answer

Section C. Final Outcome

<Logic component>

- Improved (or not being worsened) social relations

<Indicators>

(Psychological scale (5-point scale))

- Mutual trust
- Attitudes accepting diversity
- Perceived level of equality and discrimination
- Perceived socio-economic pressure and vulnerability
- Feeling of safety

C-1 (note for surveyor: Mutual trust): I trust most people living in my neighborhood.

- 1. Strongly agree
- 2. Agree
- 3. Neutral
- 4. Disagree
- 5. Strongly disagree
- 99. Don't know / Prefer not to answer

C-2 (note for surveyor: Mutual trust) : I can rely on my Syrian/ Jordanian neighbor to take care of my house if I am away. (If the respondent is a Syrian, ask about Jordanian neighbor. If the respondent is a Jordanian, ask about Syrian neighbor).

- 1. Strongly agree
- 2. Agree
- 3. Neutral
- 4. Disagree
- 5. Strongly disagree
- 99. Don't know / Prefer not to answer

C-3 (note for surveyor: Attitudes accepting diversity): I am/would be happy to work side by side with Jordanians/Syrians. (If the respondent is a Syrian, ask about working with Jordanians. If the respondent is a Jordanian, ask about working with Syrians).

- 1. Strongly agree
- 2. Agree
- 3. Neutral
- 4. Disagree
- 5. Strongly disagree
- 99. Don't know / Prefer not to answer

C-4 (note for surveyor: Attitudes accepting diversity) : I would be happy for my children (or future children) to have Jordanian/ Syrian friends. (If the respondent is a Syrian, ask about Jordanian friends. If the respondent is a Jordanian, ask about Syrian friends).

- 1. Strongly agree
- 2. Agree
- 3. Neutral
- 4. Disagree

- 5. Strongly disagree
- 99. Don't know / Prefer not to answer

C-5 (note for surveyor: Attitudes accepting diversity) : In my community/ neighborhood, people from different nationalities live well together.

- 1. Strongly agree
- 2. Agree
- 3. Neutral
- 4. Disagree
- 5. Strongly disagree
- 99. Don't know / Prefer not to answer

C-6 (note for surveyor: Perceived level of equality and discrimination) : I find Jordanian/Syrian people helpful to Syrians/Jordanians. (If the respondent is a Syrian, ask about Jordanian people being helpful to Syrians. If the respondent is a Jordanian, ask about Syrian people being helpful to Jordanians).

- 1. Strongly agree
- 2. Agree
- 3. Neutral
- 4. Disagree
- 5. Strongly disagree
- 99. Don't know / Prefer not to answer

C-7 (note for surveyor: Perceived level of equality and discrimination) : I have not been treated differently in the past six months because of my nationality.

- 1. Strongly agree
- 2. Agree
- 3. Neutral
- 4. Disagree
- 5. Strongly disagree
- 99. Don't know / Prefer not to answer

C-8 (note for surveyor: Perceived socio-economic pressure and vulnerability):The current employment situation has led to discontent within my community/ neighborhood.

- 1. Strongly agree
- 2. Agree
- 3. Neutral
- 4. Disagree
- 5. Strongly disagree
- 99. Don't know / Prefer not to answer

C-9 (note for surveyor: Feeling of safety): Most of the time, I feel safe in my neighborhood.

- 1. Strongly agree
- 2. Agree
- 3. Neutral
- 4. Disagree
- 5. Strongly disagree
- 99. Don't know / Prefer not to answer

Section D. External factors

Influence of COVID19

- (1) Influence on the amount of water use
- (2) Influence on feelings over water supply
- (3) Influence on human relationship (including behavioral change)

Other possible factors

- (1) Change in situation of other sectors (Employment, accessibility and affordability of housing, waste collection, education, and health care, etc.)
- (2) Support from other donors and NGOs

D-1 To what extent has the amount of water your household use increased or decreased due to response to COVID 19?

- 1. Increased very much
- 2. Increased by some degree
- 3. Stayed approximately the same
- 4. Decreased by some degree
- 5. Decreased very much.
- 99. Don't know / Prefer not to answer

} If the answer is 3,4,5, or 99, go to **D-3**

D-2 What is the main reason for your answer in D-1? (Multiple choice)

- 1. Washing hands more often
- 2. Using flush more often in the toilet
- 3. Washing clothes more
- 4. Washing vegetables/fruits more
- 5. Drinking water more
- 6. Taking shower more often
- 7. Using more water for cleaning
- 8. Other, please specify ()
- 9. Don't know / Prefer not to answer

D-3 Has COVID 19 had any influence on the YWC's water supply operation? (Multiple choice)

- 1. No influence
- 2. Reduced / delayed water supply
- 3. Taking more time to repair and maintenance request
- 4. Less response to complaints
- 5. Less frequency of user fee collection
- 6. Other, please specify ()
- 7. Don't know / Prefer not to answer

D-4 Has COVID19 affected your perception about water supply?

- 1. Became more concerned about water shortage
- 2. Same or No change
- 3. Became less concerned about water shortage
- 99. Don't know / Prefer not to answer

D-5 How has COVID19 affected your relationship with your neighbors?

- 1. Much more meetings and conversation with neighbors
- 2. A little more meetings and conversation with neighbors
- 3. Same
- 4. Less meetings and conversation with neighbors
- 5. Almost/completely stopped having meeting

99. Don't know / Prefer not to answer

D-6 How has COVID19 affected your relationship with Syrians/Jordanians? (If the respondent is a Syrian, ask about Jordanians. If the respondent is a Jordanian, ask about Syrians).

1. Much more meetings and conversation with neighbors
2. A little more meetings and conversation with neighbors
3. Same
4. Less meetings and conversation with neighbors
5. Almost/completely stopped having meeting
99. Don't know / Prefer not to answer

D-7 How has the situation of the following issues in your community / neighborhood changed do you perceive compared with the last year?

Issues	Your perception			
Employment (# of jobs available)	1. Better	2. Same	3. Worse	99. Don't know / Prefer not to answer
Accessibility & affordability of housing	1. Better	2. Same	3. Worse	99. Don't know / Prefer not to answer
Waste collection	1. Better	2. Same	3. Worse	99. Don't know / Prefer not to answer
Education	1. Better	2. Same	3. Worse	99. Don't know / Prefer not to answer
Health care	1. Better	2. Same	3. Worse	99. Don't know / Prefer not to answer
Other, specify ()	1. Better	2. Same	3. Worse	99. Don't know / Prefer not to answer

D-8 Are you aware of any external assistance (by foreign governments, international organizations such as the UN, NGOs, etc.) in your community / neighborhood in the following issues over the past one year?

Issues	Answer
Water supply	1. Yes (please specify _____) 2. No 99. Don't know / Prefer not to answer
Employment / Livelihood support	1. Yes (please specify _____) 2. No 99. Don't know / Prefer not to answer
Housing	1. Yes (please specify _____) 2. No 99. Don't know / Prefer not to answer
Waste collection	1. Yes (please specify _____) 2. No 99. Don't know / Prefer not to answer
Education	1. Yes (please specify _____) 2. No 99. Don't know / Prefer not to answer
Health care	1. Yes (please specify _____) 2. No 99. Don't know / Prefer not to answer
Refugee assistance	1. Yes (please specify _____) 2. No 99. Don't know / Prefer not to answer
Other, specify ()	1. Yes (please specify _____) 2. No 99. Don't know / Prefer not to answer

Section E. Profile of the Respondent and the household

Basic information on the respondent

E-1 Your nationality

1. Jordanian

- 2.Syrian
- 3.Other, specify ()
- 99. Don't know / Prefer not to answer

E-2 Years/Month as resident in the area you live in (Hawwara/ Sarih): How long have you lived in this community?

- () Years () Month
- 99. Don't know / Prefer not to answer

E-3 Number of household members including you (who lives with you)

- () persons
- 99. Don't know / Prefer not to answer

E-4 Type of residence

- 1. Own
- 2. Leasing apartment
- 3. Sub-leasing apartment
- 4. Other, specify ()
- 99. Don't know / Prefer not to answer

E-5 Employment of the household member who earns most

- 1. Self-employment
- 2. Hired by private companies/shops/entities (including NGOs and international organizations)
- 3. Public servant
- 4. Unemployed
- 4. Other, specify ()
- 99. Don't know / Prefer not to answer

E-6 Range of total annual income of your household including transfer from families/relatives, etc.

- 1. 0 - 5,000 JD
- 2. 5,001 – 10,000 JD
- 3. 10,001 - 20,000 JD
- 4. 20,001 - 50,000 JD
- 5. More than 50,000JD
- 99. Don't know / Prefer not to answer

E-7 Gender of the head of the household

- 1. Male
- 2. Female

E-8 The final education level of the head of the household

- 1.No formal education
- 2. Primary
- 3. Vocational
- 4. Secondary
- 5.University degree
- 6. Post graduate
- 7.Other, specify ()
- 6.Don't know / Prefer not to answer.

E-9 Respondent's age

1. Under 20 years old
2. 20-29
3. 30-39
4. 40-49
5. 50-59
6. 60-69
7. Over 70 years old

99. Don't know/ Prefer not to answer

E-10 Respondent's gender

1. Male
2. Female

99. Don't know/ Prefer not to answer

E-11 Comment, if any.

--

Thank you very much for your cooperation!!

Surveyor, please fill-in the following information.

Date of interview	
Surveyor's name	
Respondent's address	
GPS location, if available	
YWC customer ID (if subscriber)	
Respondent's phone number (Land/Mobile)	
Respondent's E-mail address	

2. Endline Survey

Households Sample Survey Questionnaire <Endline Survey>

About this survey

The Programme for Urgent Improvement of Water Sector for the Host Communities of Syrian Refugees in Northern Governorates (Phase 2) is implemented by UNOPS in accordance with the Grant Agreement with JICA. The programme aims to promote social stability in Jordan through the improved quality of, and access to water supply services for Jordanian residents in the Hawwara and Sariéh Districts, as well as for the Syrian refugees in the host communities and the surrounding areas, through the construction of new water distribution networks, in addition to improving the existing ones.

This survey evaluates the impact of the programme on the social stability in the target districts. The purpose of the survey is to extract recommendations, lessons learned, and feedback for JICA that can be utilized in its future assistance to refugees and host communities.

All information collected in this survey will be treated confidentially. The results will be made available to statistical analysis, but individual (persona) information will not be identified. Please feel free to express your feelings and opinions. Thank you for contributing valuable time to take this survey.

About this questionnaire

This survey questionnaire should be answered by an adult member of the responding household, but head of household is preferred.

Enumerator will circle the number of the applicable answer. The example of circling the answer is shown below.

Example - Over the past month, how often did you receive water from the public network?

1. Every day
2. Three times a week
3. Twice a week
4. Once a week
5. Once every two weeks
6. Once a month
7. Never
99. Don't know / Prefer not to answer

Section A. Initial Outcome

<Logic component>

- Increase in the amount of water use from the public network
- Increase in the days and hours that water can be used (supplied)

<Indicators>

- # of days and hours residents can use water per week
- Water pressure and quantity at each household
- Decrease of spending to purchase water at each household

A-01 Have you ever faced a water shortage in general (regardless of the public network or other source) last August (2022)? (NOTE: “water shortage” means the absolute amount of water available is not sufficient to meet the needs. It is NOT the satisfaction level or level that met respondent’s expectation.)

If yes, how many days?

1. Yes → ___# days
2. No
99. Don’t know / Prefer not to answer

A-02 Last winter (December 2021– February 2022), did you face a water shortage in general (regardless of the public network or other source)?

If yes, how many times?

1. Yes → ___# of times
2. No
99. Don’t know / Prefer not to answer

A-03 Is your house/residence connected to the public water network?

1. Yes -> Since when? () (e.g.) If the answer is April 2020, write 202004.

2.No -> What is the reason?

1. No public network in my area
2. Being disconnected due to nonpayment of bills
3. Cannot afford
4. Not satisfied with the water supply by YWC
5. Other, please specify ()
99. Don’t know / Prefer not to answer

99. Don’t know / Prefer not to answer

A-04 What is the size of the water tank of your household and where is it located?

Size () m³ (If there are more than one tank, add them up).

Location

1. Rooftop
2. Basement
3. On the ground
4. There is no tank
5. Other, please specify ()
99. Don’t know / Prefer not to answer

A-05 In what ways, other than the public network, does your household obtain water? (Multiple choice)

1. Buy water from Water Tanker (Public/government)

2. Buy water from Water Tanker (Private firm)
3. Buy bottled water (Big bottle, such as 5 - 20 litres)
4. Buy bottled water (small bottle, such as less than 5 litres)
5. Obtain water from private well
6. Other, please specify ()
7. None of the above (No water obtained from sources other than the public network)

A-06 What water source does your household mainly use for Drinking Water ? and if the answer is other than the public network, what is the reason? (single answer)

1. Public network (direct from tap, after filtering or boiling)
2. Bottled water
3. Water tanker
4. Water from private well
5. Other, please specify ()
99. Don't know / Prefer not to answer

If the answer is 2.-5., the reason →

1. Not enough water from the public network
2. The public water quality is not acceptable
3. Not connected to the public network
4. Other, please specify ()

A-07 What water source does your household mainly use for Cooking ? and if the answer is other than the public network, what is the reason? (single answer)

1. Public network (direct from tap, after filtering or boiling)
2. Bottled water
3. Water tanker
4. Water from private well
5. Other, please specify ()
99. Don't know / Prefer not to answer

If the answer is 2.-5., the reason →

1. Not enough water from the public network
2. The public water quality is not acceptable
3. Not connected to the public network
4. Other, please specify ()

A-08 What water source does your household mainly use for Other Household Purposes (Washing, Cleaning, Shower, etc.) ? and if the answer is other than the public network, what is the reason? (single answer)

1. Public network (direct from tap, after filtering or boiling)
2. Bottled water
3. Water tanker
4. Water from private well
5. Other, please specify ()
99. Don't know / Prefer not to answer

If the answer is 2.-5., the reason →

1. Not enough water from the public network
2. The public water quality is not acceptable
3. Not connected to the public network
4. Other, please specify ()

A-09 Are you connected to the newly installed/replaced distribution pipe? (single answer)

1. Yes -> Since when? () (e.g.) If the answer is April 2020, write 202004.
2. No

99. Don't know / Prefer not to answer

A-1 Last August (2022), how often did you receive water from the public network and how many hours did the supply continue each time?

1. Every day
2. Every other days
3. Once every three days
4. Once every four days
5. Once every five days
6. Once every six days
7. Once a week
8. Once every two weeks
9. Never
10. Other, please specify ()
99. Don't know / Prefer not to answer

The length of supply each time → _____ # hours

A-2 Have you ever faced a water shortage from the public network last August (2022)?

If yes, how many days?

1. Yes → ___ # days
2. No
99. Don't know / Prefer not to answer

A-3 Last winter (December 2021– February 2022), did you face a water shortage from the public network?

If yes, how many times?

1. Yes → ___ # of times
2. No
99. Don't know/ Prefer not to answer.

A-4 Over the past month, how was the water pressure your household received from the public network (when water is available)?

1. Always strong
2. Almost always strong
3. Sometimes strong and sometimes weak
4. Almost always weak
5. Always weak
6. Water was never available
99. Don't know / Prefer not to answer

A-5 Over the past month, how accurate was the public network water distribution schedule announced by YWC?

1. Very accurate (The water is always supplied as scheduled)
2. Almost always accurate
3. Sometimes accurate and sometimes inaccurate
4. Almost always inaccurate
5. Very inaccurate (The water is never supplied as scheduled)

99. Don't know / Prefer not to answer

A-6 How much money (JD) did your household spend to buy water (water tanker, bottled water, etc.) other than the public water service last August (2022)? If you pay with another currency, please answer the currency and amount. (Multiple choice)

1. JD () <- If the recipient's household did not spend any money, enter "0".
2. Currency & amount ()
3. Don't know / Prefer not to answer

A-7 Last winter (December 2021– February 2022), how much money (JD) did your household spend to buy water (water tanker, bottled water, etc.) other than the public water service per one month? If you pay with another currency, please answer the currency and amount. (Multiple choice)

1. JD () <- If the recipient's household did not spend any money, enter "0".
2. Currency & amount ()
3. Don't know / Prefer not to answer

A-8 If your household bought water from water tanker last August (2022), how many times and how much quantity did you buy and how much money (JD) did you spend for it? If you pay with another currency, please answer the currency and amount.

How many times you bought: () times
Total quantity you bought: () m³
Total spending for buying water from water tanker ()JD
If you pay with another currency, please specify ().

A-9 If your household bought bottled water last August (2022), how many times and how much quantity did you buy and how much money (JD) did you spend for it? If you pay with another currency, please answer the currency and amount.

How many times you bought: () times
Total quantity you bought: () litres
Total spending for buying bottled water ()JD
If you pay with another currency, please specify ().

A-10 Did the total money your household spent for obtaining water from sources other than the public network last August (2022) increase or decrease compared to the same month of last year (2021)?

1. Much Increased
2. Increased by some degree
3. Same or almost same
4. Decreased by some degree
5. Much decreased
99. Don't know / Prefer not to answer

Section B. Intermediate Outcome

<Logic component>

- Improved feelings over and perception on water supply

<Indicators>

- # of complaints
- Perceived improvement in water supply quantity
- Perceived improvement in water quality

- Perceived trend of water supply quantity
- Perceived factors influencing water shortage
- Awareness of external assistance incl. this Project and perception over user fee collection

B-1 How many times have you made complaints to the YWC about water supply or water quality last August (2022)?

() times
 99. Don't know / Prefer not to answer

B-2 To what extent has the quantity of water supply been improved or deteriorated in your community/neighborhood compared between last August (2022) and one year ago (August 2021) ?

1. Much improving
2. Improving
3. No change
4. Deteriorating
5. Much deteriorating
99. Don't know / Prefer not to answer

B-3 To what extent has the water quality improved or deteriorated in your community/ neighborhood compared between last August (2022) and one year ago (August 2021)?

1. Much improving
2. Improving
3. No change
4. Deteriorating
5. Much deteriorating
99. Don't know / Prefer not to answer

B-4 Overall, are you satisfied with the public water supply?

1. Yes, satisfied
2. No, not satisfied
99. Don't know / Prefer not to answer

B-5 In case your household faced a water shortage/s last August (2022), rank the most important causes (Multiple choice. Maximum 3 choices) (Write 1, 2, 3; 1= most important)

Rank (Max 3 answers. 1=most important)	Possible cause
	1 Public water supply is not frequent enough
	2 Not enough storage capacity
	3 More people joined the household and the water was not enough for everyone
	4 Cannot afford to buy water from water shops and water tankers
	5 Due to population influx in the area, the water was not enough for everyone
	6 Private water vendors cannot be trusted
	7 The private well dried up
	8 The water flow/pressure (pumped through pipes) is weak
	9 None of the above

	98 other: _____
	99 Don't know / Prefer not to answer.
	97 My family did not face any water shortages → go to question B-7

B-6 To what extent have the water shortages led to discontent within your community/ neighborhood?

1. Very much
2. By some degree
3. More or less
4. Almost no
5. Never at all.
99. Don't know / Prefer not to answer

B-7 Were you aware that JICA and UNOPS have supported this Project to improve water supply in your community/ neighborhood?

1. Yes
2. No
99. Prefer not to answer

Section C. Final Outcome

<Logic component>
• Improved (or not being worsened) social relations
<Indicators>
(Psychological scale (5-point scale)
• Mutual trust
• Attitudes accepting diversity
• Perceived level of equality and discrimination
• Perceived socio-economic pressure and vulnerability
• Feeling of safety

C-1 (note for surveyor: Mutual trust): I trust most people living in my neighborhood.

1. Strongly agree
2. Agree
3. Neutral
4. Disagree
5. Strongly disagree
99. Don't know / Prefer not to answer

C-2 (note for surveyor: Mutual trust) : I can rely on my Syrian/ Jordanian neighbor to take care of my house if I am away. (If the respondent is a Syrian, ask about Jordanian neighbor. If the respondent is a Jordanian, ask about Syrian neighbor).

1. Strongly agree
2. Agree
3. Neutral
4. Disagree
5. Strongly disagree
99. Don't know / Prefer not to answer

C-3 (note for surveyor: Attitudes accepting diversity): I am/would be happy to work side by side with Jordanians/Syrians. (If the respondent is a Syrian, ask about working with Jordanians. If the respondent is a Jordanian, ask about working with Syrians).

1. Strongly agree
2. Agree
3. Neutral
4. Disagree
5. Strongly disagree
99. Don't know / Prefer not to answer

C-4 (note for surveyor: Attitudes accepting diversity) : I would be happy for my children (or future children) to have Jordanian/ Syrian friends. (If the respondent is a Syrian, ask about Jordanian friends. If the respondent is a Jordanian, ask about Syrian friends).

1. Strongly agree
2. Agree
3. Neutral
4. Disagree
5. Strongly disagree
99. Don't know / Prefer not to answer

C-5 (note for surveyor: Attitudes accepting diversity) : In my community/ neighborhood, people from different nationalities live well together.

1. Strongly agree
2. Agree
3. Neutral
4. Disagree
5. Strongly disagree
99. Don't know / Prefer not to answer

C-6 (note for surveyor: Perceived level of equality and discrimination) : I find Jordanian/Syrian people helpful to Syrians/Jordanians. (If the respondent is a Syrian, ask about Jordanian people being helpful to Syrians. If the respondent is a Jordanian, ask about Syrian people being helpful to Jordanians).

1. Strongly agree
2. Agree
3. Neutral
4. Disagree
5. Strongly disagree
99. Don't know / Prefer not to answer

C-7 (note for surveyor: Perceived level of equality and discrimination) : I have not been treated differently in the past six months because of my nationality.

1. Strongly agree
2. Agree
3. Neutral
4. Disagree
5. Strongly disagree
99. Don't know / Prefer not to answer

C-8 (note for surveyor: Perceived socio-economic pressure and vulnerability):The current employment situation has led to discontent within my community/ neighborhood.

- 1. Strongly agree
- 2. Agree
- 3. Neutral
- 4. Disagree
- 5. Strongly disagree
- 99. Don't know / Prefer not to answer

C-9 (note for surveyor: Feeling of safety): Most of the time, I feel safe in my neighborhood.

- 1. Strongly agree
- 2. Agree
- 3. Neutral
- 4. Disagree
- 5. Strongly disagree
- 99. Don't know / Prefer not to answer

Section D. External factors

<p>Influence of COVID19</p> <ul style="list-style-type: none"> (1) Influence on the amount of water use (2) Influence on feelings over water supply (3) Influence on human relationship (including behavioral change) <p>Other possible factors</p> <ul style="list-style-type: none"> (1) Change in situation of other sectors (Employment, accessibility and affordability of housing, waste collection, education, and health care, etc.) (2) Support from other donors and NGOs
--

D-1 To what extent has the amount of water your household use increased or decreased due to response to COVID 19?

- 1. Increased very much
- 2. Increased by some degree
- 3. Stayed approximately the same
- 4. Decreased by some degree
- 5. Decreased very much.
- 99. Don't know / Prefer not to answer

} If the answer is 3,4,5, or 99, go to **D-3**

D-2 What is the main reason for your answer in D-1? (Multiple choice)

- 1. Washing hands more often
- 2. Using flush more often in the toilet
- 3. Washing clothes more
- 4. Washing vegetables/fruits more
- 5. Drinkig water more
- 6. Taking shower more often
- 7. Using more water for cleaning
- 8. Other, please specify ()
- 9. Don't know / Prefer not to answer

D-3 Has COVID 19 had any influence on the YWC's water supply operation? (Multiple choice)

- 1. No influence
- 2. Reduced / delayed water supply
- 3. Taking more time to repair and maintenance request

4. Less response to complaints
5. Less frequency of user fee collection
6. Other, please specify ()
7. Don't know / Prefer not to answer

D-4 Has COVID19 affected your perception about water supply?

1. Became more concerned about water shortage
2. Same or No change
3. Became less concerned about water shortage
99. Don't know / Prefer not to answer

D-5 How has COVID19 affected your relationship with your neighbors?

1. Much more meetings and conversation with neighbors
2. A little more meetings and conversation with neighbors
3. Same
4. Less meetings and conversation with neighbors
5. Almost/completely stopped having meeting
99. Don't know / Prefer not to answer

D-6 How has COVID19 affected your relationship with Syrians/Jordanians? (If the respondent is a Syrian, ask about Jordanians. If the respondent is a Jordanian, ask about Syrians).

1. Much more meetings and conversation with Syrians/Jordanians
2. A little more meetings and conversation with Syrians/Jordanians
3. Same
4. Less meetings and conversation with Syrians/Jordanians
5. Almost/completely stopped having meeting
99. Don't know / Prefer not to answer

D-7 How has the situation of the following issues in your community / neighborhood changed do you perceive compared with the last year (2021)?

Issues	Your perception
Employment (# of jobs available)	1. Better 2. Same 3. Worse 99. Don't know / Prefer not to answer
Accessibility & affordability of housing	1. Better 2. Same 3. Worse 99. Don't know / Prefer not to answer
Waste collection	1. Better 2. Same 3. Worse 99. Don't know / Prefer not to answer
Education	1. Better 2. Same 3. Worse 99. Don't know / Prefer not to answer
Health care	1. Better 2. Same 3. Worse 99. Don't know / Prefer not to answer
Other, specify ()	1. Better 2. Same 3. Worse 99. Don't know / Prefer not to answer

D-8 Are you aware of any external assistance (by foreign governments, international organizations such as the UN, NGOs, etc.) in your community / neighborhood in the following issues over the past one year?

Issues	Answer
Water supply	1. Yes (please specify _____) 2. No 99. Don't know / Prefer not to answer
Employment / Livelihood support	1. Yes (please specify _____) 2. No 99. Don't know / Prefer not to answer

Housing	1. Yes (please specify _____) 2. No 99. Don't know / Prefer not to answer
Waste collection	1. Yes (please specify _____) 2. No 99. Don't know / Prefer not to answer
Education	1. Yes (please specify _____) 2. No 99. Don't know / Prefer not to answer
Health care	1. Yes (please specify _____) 2. No 99. Don't know / Prefer not to answer
Refugee assistance	1. Yes (please specify _____) 2. No 99. Don't know / Prefer not to answer
Other, specify (_____)	1. Yes (please specify _____) 2. No 99. Don't know / Prefer not to answer

D-9 How have the commodity price changed since last year (2021) ?

1. Pita bread (1kg) one year ago (2021): (_____) dinars
2. Pita bread (1kg) now: (_____) dinars
3. Gasoline (1 litre) one year ago (2021): (_____) dinars
4. Gasoline (1 litre) now: (_____) dinars

Section E. Profile of the Respondent and the household

Basic information on the respondent

E-1 Your nationality

1. Jordanian
2. Syrian -> which part of Syria are you originally from? (_____)
3. Other, specify (_____)
99. Don't know / Prefer not to answer

E-2 Years/Month as resident in the area you live in (Hawwara/ Sarih): How long have you lived in this community?

(_____) Years (_____) Month
99. Don't know / Prefer not to answer

E-3 Number of household members including you (who lives with you)

(_____) persons
99. Don't know / Prefer not to answer

E-4 Type of residence

1. Own
2. Leasing apartment
3. Sub-leasing apartment
4. Other, specify (_____)
99. Don't know / Prefer not to answer

E-5 Employment of the household member who earns most

1. Self-employment
2. Hired by private firms/shops/entities (including NGOs and international organizations)

- 3. Public servant
- 4. Unemployed
- 4. Other, specify ()
- 99. Don't know / Prefer not to answer

E-6 Range of total annual income of your household including transfer from families/relatives, etc.

- 1. 0 - 1,500 JD
- 2. 1,501 – 3,000 JD
- 3. 3,001 – 5,000 JD
- 4. 5,001 – 10,000 JD
- 5. 10,001 - 20,000 JD
- 6. 20,001 - 50,000 JD
- 7. More than 50,000JD
- 99. Don't know / Prefer not to answer

E-7 Gender of the head of the household

- 1. Male
- 2. Female

E-8 The final education level of the head of the household

- 1.No formal education
- 2. Primary
- 3. Vocational
- 4. Secondary
- 5.University degree
- 6. Post graduate
- 7.Other, specify ()
- 6.Don't know / Prefer not to answer.

E-9 Respondent's age

- 1. Under 20 years old
- 2. 20-29
- 3. 30-39
- 4. 40-49
- 5. 50-59
- 6. 60-69
- 7. Over 70 years old
- 99.Don't know/ Prefer not to answer

E-10 Respondent's gender

- 1. Male
- 2. Female
- 99.Don't know/ Prefer not to answer

E-11 Comment, if any.

Thank you very much for your cooperation!!

Surveyor, please fill in the following information.

Date of interview	
Surveyor's name	
Serial Number (same as the baseline survey)	
Zone (Hawwara/Sarieh)	
Sub-zone	
Respondent's address	
GPS location, if available	
YWC customer ID (if subscriber)	
Respondent's phone number (Land/Mobile)	
Respondent's E-mail address	

Appendix 4 References

In addition to the project documents, the evaluation team referred to the following for developing the evaluation plan and questionnaires.

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