



Coastal Municipalities Water Utility



Annual Report 2020



March 2021

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ACKNOWLEDGEMENT

This annual report has been prepared by the Coastal Municipalities Water Utility (CMWU), the report is mainly composed of all relevant activities progress schemes implemented from January to December 2020.

Special thanks are to PWA leadership for their input as a supportive regulator for the sector and to the Board of Directors of the Coastal Municipalities Water Utility for their valuable support in order to pass through the hard times and achieve CMWU's goals through implementing different activities and projects.

Thanks also continue to all CMWU's partners & donors to their continuous support in financing water and waste water projects such as KFW, ICRC, UNICEF, EU, OCHA, IsDB, AFD, QO, NRC, Oxfam, GVC, AAH, Islamic Help, Human Appeal, UNDP, Save the Children, Qatar Charity, Muslim Hands, Ma'an and GIZ.

High appreciation especially for ICRC, KFW, UNICEF, Oxfam, GIZ, NRC and AAH for their interventions to bridge the gap in O&M activities to keep running the water and wastewater services during the COVID-19 epidemic spread. Without their supports it would have been difficult to overcome many of the humanitarian problems, also their assistance to implement some of emergency projects, upgrading activities, and operation supports to avoid environmental disasters and further deterioration of the water sector as their interventions are the reason behind keeping the provision of the adequate level of water supply and wastewater collection in Gaza Strip.

EXECUTIVE SUMMARY

Throughout this year, the CMWU team manage and carry out all normal operations and maintenance tasks with all monitoring programs set as per several utility performance indicators. CMWU has succeeded in maintaining a minimum level of safe WASH services that are essential in curbing the spread of COVID-19 in the densely populated Gaza Strip.

The overall hydraulic efficiency of the existing water distribution networks is **64.5%** with **35.5% of** Non-Revenue Water (NRW) for Middle, Khan Younis and Rafah governorates, while it reached around **60%** in average for all Gaza Strip including Gaza and North governorates, Water Wells functionality efficiency is **99.25%** for Middle, Khan Younis and Rafah governorates, water disinfection efficiency is over **97.38%**. Also, manage weekly quality monitoring program for all wastewater treatment plants through utilizing CMWU central lab. During 2020 there is a slight improvement in wastewater treatment efficiency; despite of operating the new WWTP in Khan Younis, the efficiency has reached **84 %** in average since it is affected by the low treatment efficiency of Al Sheikh Ejleen WWTP which was operated partially for more than three months due to the rehabilitation and maintenance works.

The treatment efficiency will be dramatically improved during 2021 as the newly constructed WWTPs in Khan Younis and Central will be operational with high treatment efficiency.

The CMWU has carried out more than **80** predictive, preventive and corrective maintenance job orders at various areas for the existing **back up** electric power supply generators that are heavily and severely affected by long daily hours of operations which create lots of repair and maintenance needs and parts. During the period of this year the grid electricity supply was mostly stable on daily scheme of 8 hours on ,8 hours off, 8 hours on. Over the last years, the CMWU had used to operate the standby generators of WASH facilities during electricity cut offs and the fuel supply was almost secured by several financing and humanitarian agencies. Unfortunately, this emergency fuel supply was stopped and not supported since the last two years 2019, 2020 which negatively affected in somehow various services provisions.

The CMWU carries out on time reactions with all programmed inspections and preventive maintenance requirements for all water and wastewater facilities, more than **2050** repair job orders were carried out during 2020 for all municipal areas.

Moreover, and due to the deteriorated economic situations that the Gaza strip faces under political division, alleged reconciliation procedures (salaries deduction percentages, Early retirement, etc..), COVID-19 spread and lockdown, siege continuity, the collection ratios in the

Gaza Governorates has declined; it reached around 20% as an average by the end of December 2020.

On the other hand, other strategic activities are on-going:

1. The construction of STLV seawater desalination plant 6,000 m³/day; which is funded by EU and implemented by UNICEF in cooperation with PWA and CMWU is operated Also, the installed on-grid 560KWp PV solar system is successfully operated under sharing scheme with the Grid to serve south STLV desalination plant and reduce specific power consumption by 12%. , while the construction of the second phase to expand the plant to reach 20,000m³/day is still ongoing with targeted completion and commissioning end-2021 .
2. The construction of Gaza sea water desalination plant (10,000 m³/day) as part of the STLV funded by KDF-IsDB was successfully completed and it was connected with the dedicated power line early 2020, and due to electricity shortage, the plant is daily operated around 12 hours to pump the desalinated water to blending tank to serve the western districts of Gaza city.
3. The construction of Gaza central wastewater treatment plant with capacity 60,000m³ /day as phase I; is still under testing and commissioning; the project is funded by KFW and implemented by the CMWU; besides construction the plant, the project also includes upgrading of Al Sheikh Ejleen existing WWTP, providing BWWTP and Al Sheikh Ejleen WWTP with 5 Megawatt of solar energy system, besides cleaning Wadi Gaza. All activities are completed.
4. The construction of Khan Younis central wastewater treatment plant with capacity of 26,000m³ /day (phase I) is completed and the plant is operational but with less incoming flow 15,000 m³/day; the project is funded by KDF-IsDB & Japan and implemented by UNDP in cooperation with CMWU and PWA. Also, the plant will be provided during 2021-2023 with 7 Megawatt of PV solar system through different donations.
5. The CMWU in cooperation with Oxfam through EU fund has almost completed the implementation of “strengthening the Effectiveness of the public brackish desalination plants in Gaza Strip”, the project includes rehabilitation works for 16 Ro plants in addition to providing solar system for 6 RO plants in addition to supplying spare parts for RO plants.

6. In cooperation with PWA and CMWU, UNICEF through Kuwaiti fund has launched the consultancy services tender for construction storm water system at Khan Younis & Dair Al Balah, to protect 100,000 inhabitants from yearly floods, in addition to providing 6 WASH facilities with solar energy. The design of stormwater activity has been developed and the tender already launched, the physical works will start on the ground by January 2021.
7. Through EU fund, the CMWU has developed a consultancy tender documents for storm water project in Rafah and providing 3 WASH facilities with PV solar system, the consultancy tender has been submitted to MOF for adding the administrative part and then to proceed with launching the tender once approved by the EU.
8. Construction of Aslan Storm water basin at Beit Lahiya, over 8000 m² to protect 25000 people from flooding and to infiltrate 0.3 Mm³/ year, the project is financed by IsDB and implemented by EMMAR Gaza in cooperation with CMWU and PWA. The project is recently completed and operated, its positive impact has been touched during 2020-2021 winter season.
9. In cooperation with NRC and through OCHA fund, the CMWU has completed the Construction of stormwater infiltration basin over 3 donums at western Rafah, to collect and infiltrate the water from 200 donums catchment area.
10. As a part of KHWWT, the CMWU in cooperation with UNDP and through KDF-IsDB fund is currently upgrading the central sewage pumping station.08 , this PS is designed to receive the sewage flow from all Khan Younis city besides a large part of eastern villages , then the collected wastewater is pumped to KHWWT through the newly constructed pressure carrier line. In addition, KHWWT will be provided with solar energy system through EU, Norwegian and KDF funds. The agreements are signed and the tenders will be launched during 2021
11. As a part of KHWWT, the CMWU through KDF-IsDB fund, will construct early 2021 wastewater networks at Al Fokhari area (European neighbourhood), and the new network will be connected with PS.08.
12. Extension of the existing stormwater box culvert in Rafah to collect the rain water from additional catchments and discharging it in the newly constructed basin, in addition to connecting the existing stormwater pumping station with electrical network to pump the extra water from the basin to the sea in emergencies, the project is financed by EU, and

through 2nd quarter of 2021 a consultant will be hired to develop the tender documents for that project.

13. Construction stormwater networks at Al Wafiya area -Khan Younis, the project is financed by KDF through UNICEF, the work will start early 2021
14. Construction of Eastern brackish Ro plant at Rafah with 50m³/hr capacity, the project is financed by Human Appeal and will be implemented soon.
15. Launch the consultancy services tender under energy saving program which is financed by KFW, the tender will be awarded during 1st quarter of 2021, the program aims to reduce the energy consumption in water and wastewater facilities, it includes several interventions like (PV installations, pumps' replacement, VFDs installations, ...etc).
16. Start preparation, the projects' tender documents under GIZ recent agreement "COVID-19 related maintenance and repairs support to essential service provision", the projects will be launched in January and February 2021.

INTRODUCTION

Throughout **2020** year, all efforts and activities have been directed in parallel with some contributions towards implementing the essential required water, wastewater and storm water projects and managing a set of operational and maintenance tasks, especially after operating the newly constructed facilities (STLVs and WWTPs), such projects are playing a great role to improve the level of services for people in the Gaza strip and to mitigate various environmental and health risks. Hence to achieve the following:

- Develop a management, operational and financial system within quality performance criteria in different areas of Gaza Strip, which affects positively the type and level of service provided.
- Offer a comprehensive vision on the water and environmental situation in all areas; consequently, it is easier to prepare plans and find solutions to avoid the rapid deterioration in water situation in Gaza Strip.
- Achieve the operational performance of all working systems efficiently, which results in lowering the operational costs, using these operational systems wisely without affecting the quality of service provided for people and reaching fairness and non-profitable endeavours.
- Participate in developing and implementing the water strategic plan such as wastewater treatment plants, desalination plants, carrier lines and water tanks. Afterwards, focus on the operation and maintenance of such strategic projects, as well as decrease the operational costs so the people can benefit from such services in the long run.
- Work together in developing different available resources and capacities (humanitarian, technical, etc.) to manage and to have the water and wastewater sector functional, especially in times of crises and emergencies.
- Implement various plans, studies, and strategic projects, accredited and approved from parties such as PWA, MOP, EQA and MOLG, in order to elevate the quality of services offered to the citizens in a fair way and without any bias to any specific area.
- Develop and prepare the O&M budgetary plan for 2019-2025 which details the annual operation and maintenance expenses and costs required to maintain water and wastewater services at acceptable level over the coming five years.
- Develop and update the CMWU strategic plan for 2018-2023,

During the year, CMWU teams through several funding agencies such as ICRC, AAH, OXFAM, KFW, EU, save the children, NRC and GVC continue upgrading, rehabilitation, and resizing the water and wastewater facilities and networks to improve the water and wastewater services.

However, the implementation of different interventions has been facing a number of obstacles and restrictions, starting with COVID-19 pandemic which is still the most influential obstacle, it releases negative impacts on all life sectors including water and wastewater. In addition to that, suspension of the coordination between the Palestinian Authority and the Israeli side for more than 5 months has caused additional complexity on getting the needed materials and equipment across the commercial gates. These restrictions and control over materials and equipment deliveries through the borders' gates have continued to cause several development strategies and plans to be in a noticeable delay and have affected on PWA and CMWU efforts to keep the service running without any main or major breakdown. Therefore, it has become relatively so difficult to fulfil, complete, and operate other strategic projects in the due time.

The continuity of the electricity problem and unreliable sources is still the reason behind the negative impacts on the operational schemes despite of providing many of water and wastewater facilities with solar energy systems to improve the operational situations of the targeted water wells, pumping facilities besides the treatment plants.

In Addition, Several financing and humanitarian agencies e.g., ICRC, UNICEF, ISDB, OCHA (HRF), KFW.... etc. have continued to play their great roles to assist and support part of O&M needs but with limited resources and interventions.

Meanwhile the difficulties are everywhere in the service area; so, the challenges are the motivated forces to CMWU staff to run the services and even sometimes in cooperation with PWA attract the donors to implement some of the developmental projects.

Therefore, CMWU teamwork continues to manage and implement various repair, refurbishment and overhauling works related to more than **286** water wells, **55** water Storage tanks, **100** small scale brackish water desalination plants, **3** Sea water desalination plants, **30** water Booster stations, **67** wastewater pumping stations, **5** waste water treatment plants, water networks, storm water networks, sewage collection networks and basins with all associated equipment and systems upgrading and monitoring requirements. Purpose has been kept with high level of response towards several events of preventive and corrective

repair and maintenance activities to minimize the risk of breakdown and operation time loss. Therefore, the CMWU has launched many services contracts during 2020, with local contractors for specialized upgrading, maintenance and repair needs e.g., generators, deep well water pumping sets...etc.

1- TECHNICAL PROGRESS ACTIVITIES

This report describes the progress achieved during the period from January to December 2020 in order to achieve the CMWU's targeted performance indicators. The running activities are being classified into different categories such as water wells activities; water desalination plants, water networks, metering management, disinfection activities, water storage tanks, wastewater pumping stations, networks and wastewater treatment plants activities with all associated mechanical and electrical upgrading, refurbishment and repair activities.

IMPROVING QUALITY & QUANTITY OF WATER

A. Improve the Water Quantities

A.1 Overall Water Distribution System Efficiency

Throughout 2020, and despite of various operational, economical constraints and challenge, CMWU continues managing, implementing and monitoring several programs and provide all relevant resources in order to improve the overall hydraulic efficiency of the existing water distribution networking systems and reduce the quantities of Non-Revenue Water (NRW) down to **35.5%** in the Middle and Southern Governorates, and **40%** in all Gaza Strip governorates including Gaza and Northern governorates which needs extra efforts for improvement.

The annual records and monitoring data figures on monthly basis showed that the hydraulic system efficiency is **64.5 % for Middle and Southern governorates where it reached 60% for all Gaza Strip**. CMWU believes that through the initiatives and procedures currently in place will allow the system efficiency to be monitored and improved with similar focus in the future especially in Gaza City since it was late in joining the CMWU. The improved management of data introduced by CMWU continues to be a valuable tool to monitor and report the figures of overall system efficiency and non-revenue water each month. Meter readings continue to be collected by the Municipalities and CMWU regional areas' staff. Although new data collection and verification procedures were introduced, some difficulties were experienced in

the municipal reports; this requires CMWU to perform additional verification crosschecking and refinement of the submitted figures. The overall annual system efficiencies recorded are as follows:

Table 1 Overall Annual Water Networks System Efficiencies -Year 2020 /Middle and Southern Governorates

Water Distribution System Efficiency Report 2020				
Monthly average values-Middle and Southern governorates				
No.	Month	water production m ³	water billed m ³	System efficiency %
1	Jan-20	2965486	2108279	71.1%
2	Feb-20	2917372	2023637	69.4%
3	Mar-20	3401554	1986398	58.4%
4	Apr-20	3726500	2130800	57.2%
5	May-20	3980340	2439358	61.3%
6	Jun-20	4092138	2605134	63.7%
7	Jul-20	4165111	2681396	64.4%
8	Aug-20	3945729	2603641	66.0%
9	Sep-20	4164025	2617855	62.9%
10	Oct-20	4132728	2641123	63.9%
11	Nov-20	3710110	2614320	70.5%
12	Dec-20	3332974	2277300	68.3%
Total		44534066	28729241	64.5%

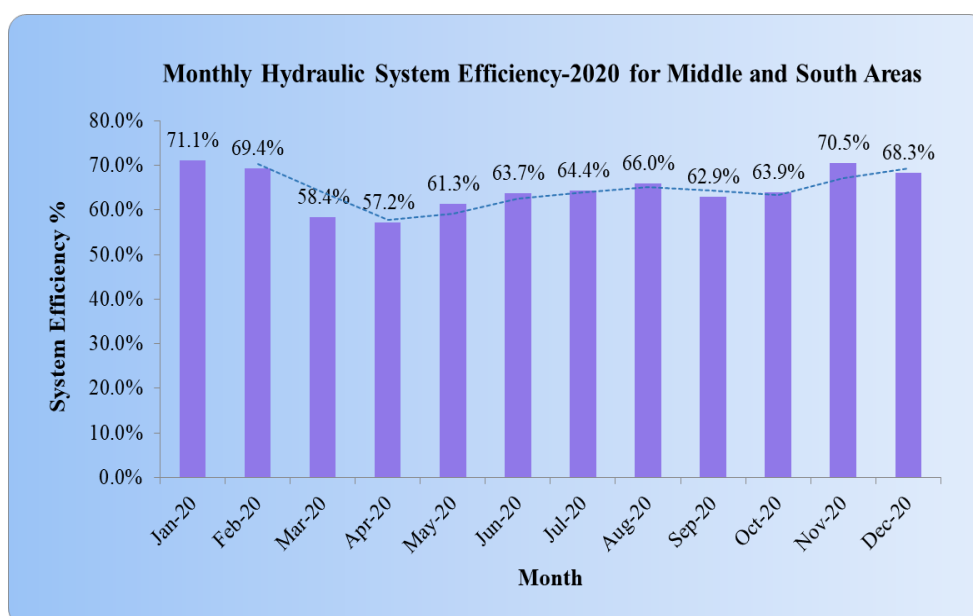


Figure 2 Overall Annual Water Networks System Efficiencies -Year 2020 /Middle and Southern Governorates

Table 2. Overall Annual Water Networks System Efficiencies -Year 2020 /All Gaza Strip Governorates

Water Distribution System Efficiency Report 2020				
Monthly average values-All Gaza Strip governorates				
No.	Month	water production m ³	water billed m ³	System efficiency %
1	Jan-20	7388691	5085810	68.8%
2	Feb-20	7277562	5033651	69.2%
3	Mar-20	8081505	4942130	61.2%
4	Apr-20	8648893	4956318	57.3%
5	May-20	9632409	5229239	54.3%
6	Jun-20	9472397	5481334	57.9%
7	Jul-20	9816642	5360615	54.6%
8	Aug-20	9434110	5347785	56.7%
9	Sep-20	9252842	5674382	61.3%
10	Oct-20	9775664	5797546	59.3%
11	Nov-20	9005458	5368108	59.6%
12	Dec-20	8278308	4523845	54.6%
Total		106064481	62800764	59.2%

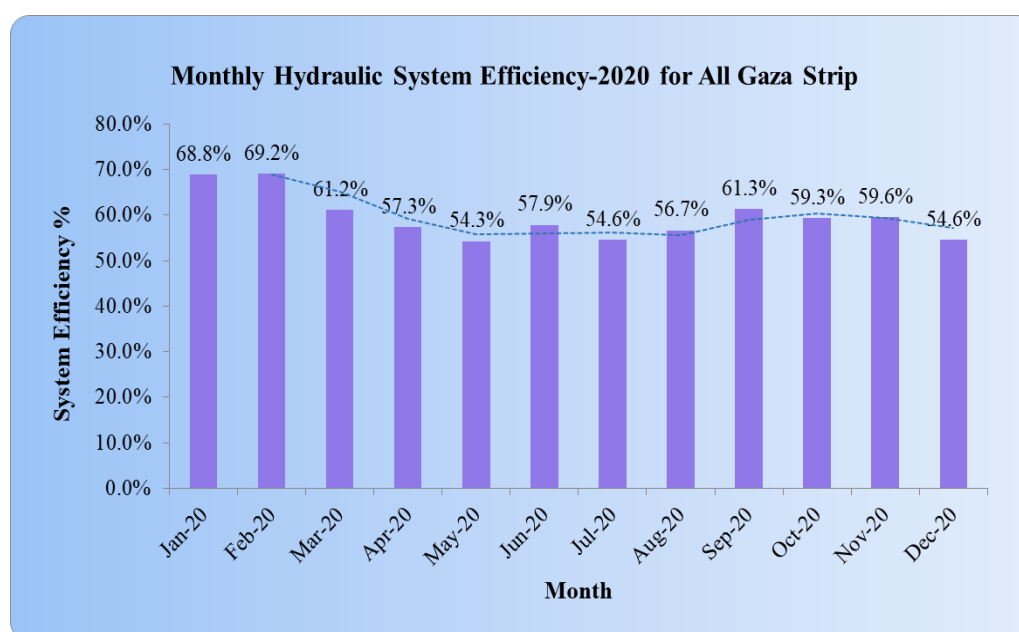


Figure 2 Overall Annual Water Networks System Efficiencies -Year 2020 /All Gaza Strip

The normal trends of behavior and increase or decrease for hydraulic system efficiency of water distribution networks in the case of Gaza strip are subject to the seasonal water demand requirements and temperature conditions. Therefore, system efficiency increases during winter months and starts to decrease when it comes hotter where illegal connections especially used for irrigation which form about 20% of Non-Revenue Water

(NRW) consume a lot of water during hot weather and negatively affects the whole system efficiency. The efforts and initiatives to improve the system efficiency have continued during year 2020 and recently crowned by EU fund with totaling budget 1 Million Euro for NRW program which will take place at Khan Younis areas during 2021. The program includes developing a plan for reducing NRW in Kan Younis city, where the physical works include networks' rehabilitation, domestic and district meters' installation, leaks detection activities in addition to public awareness campaigns, all those activities and interventions aim towards legalization of illegal connections and reduce the leakage and other losses towards improving the overall system efficiency. The following describes the main interventions implemented during 2020:

- Network Rehabilitation:

The water mains rehabilitation and repair program all over the Gaza Strip have continued to be applied by CMWU repair and maintenance team through ICRC, ANERA , UNICEF & AAH, and other interventions; in addition to the works done by CMWU mobile workshop specialized for such purposes. All the sites have been successfully handed over and operated again. The work for the construction and rehabilitation programs of water distribution networks were carried out based on criteria that was oriented towards reducing the unaccounted-for water of both commercial and technical characteristics including disconnection of illegal connections. A comprehensive network repair and maintenance program were introduced to the targeted areas during the year 2020. Several works of water networks repairs were directly initiated and applied for all emergency repairs to assure water supply system continuity at various areas of Gaza strip .This program has been implemented in co-operation with the municipalities and regional offices network repair staff. CMWU procures the repair materials and issues them from warehouse to the teams in a well-controlled procedure. The Municipal crews carry out the repairs under the supervision and support of the CMWU's staff. Repair materials including repair clamps, MDPE fittings and joints and couplings continue to be issued to the municipalities from CMWU central warehouse.

A summary of 2050 repair jobs performed during the period from January to end of December 2020 are listed in the following table provided here below:

Table 3 Networks Repair Jobs January – December 2020

Annual Water Networks Repair Monitoring Records - Number of repairs-YEAR 2020													
No.	Municipality	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	Beit Hanoun	4	8	5	7	6	8	9	10	8	11	12	11
2	Beit lahia	8	9	10	8	8	10	9	9	7	5	4	4
3	Jabalia	5	5	7	8	8	10	10	8	8	7	10	5
4	Um Al nasser	4	2	2	3	5	5	6	6	4	6	4	3
5	Gaza	5	3	3	2	3	4	4	3	2	2	2	3
6	Al Zahra	6	6	9	8	8	10	12	9	9	8	5	5
7	Wadi Gaza	3	5	3	3	4	5	4	3	3	3	4	3
8	Musader	3	4	4	3	5	6	8	4	7	4	4	2
9	Wadi Al salqa	3	3	3	2	3	3	3	2	2	4	2	
10	Moghrakah	5	6	3	5	5	10	6	4	4	5	5	3
11	Buraij	5	6	4	3	5	4	3	4	5	5	4	4
12	Maghazi	6	5	10	8	7	10	8	5	8	3	8	4
13	Deir Balah	6	6	12	13	12	9	9	17	11	12	9	11
14	Zuwaita	3	5	4	6	4	5	5	2	7	7	5	3
15	Nusirat	12	6	8	5	6	8	10	8	8	5	8	5
16	Khan Younis	20	6	20	16	22	13	15	10	15	22	18	14
17	Khoza'a	7	7	9	7	10	5	6	4	6	8	4	7
18	Qarrara	5	8	5	5	4	3	7	2	1	7	8	8
19	Abassan Kabira	7	5	10	12	3	6	9	7	5	5	8	5
20	Bani Suhaila	10	7	7	9	15	9	20	15	8	11	10	12
21	Abassan Jadidah	4	3	6	5	8	9	4	5	7	6	3	4
22	Al Fukhari	5	3	3	3	2	4	4	5	3	4	2	3
23	Al Naser	1	2	2	3	3	2	1	2	4	3	3	3
24	Al shokah	5	4	3	4	2	3	4	5	4	2	3	4
25	Rafah	30	20	23	20	16	21	19	22	25	24	23	25
Total		172	144	175	168	174	182	195	171	171	179	168	151
Total Networks Repairs		2050											

This program of water distribution networks' repairs has contributed significantly to the reduction of the unaccounted-for water in the southern governorates. CMWU anticipates that through the efforts put into this task and the procedures developed; the network repair and maintenance program will continue with a similar focus in the future.

- Meter Installation:

The meter's installation program has been initiated and continued during the period of this report. It is anticipated that the effect of the installation of new accurate meters for both household level and bulk water level, particularly replacing blocked meters, will continue to improve the overall efficiency of the system and significantly reducing non-revenue water.

The meter installation program has continued to cover non-metered buildings including Hospitals, Schools, Mosques, Universities, Parks, etc. which are consuming water that is unaccounted for either financially in terms of revenues, or technically in terms of cubic meters of water consumed. The meter readings for these buildings are considered. Usually there are reconciliations among the municipalities, the CMWU and Ministry of Finance with regard to water bills for public buildings in lieu of health insurance for employees.

The tables below illustrate the production and consumption for each municipality on a monthly basis during the year of 2020 including the received quantities from MEKEROT.

The records show that, during 2020 there was a notably increase in the total annual production and consumption, that refers to the effects of COVID-19 pandemic which has led to intensify the hygiene practices to avoid infection and pandemic outbreak. Thus, the consumed water in all areas is more than the usual annual consumption as indicated in the tables below:

Table 4 Total Annual water supply 2020/All resources:

#	Municipality	Monthly Water Supply (m3)- year 2020/ All resources (Water Wells, Mekerot and STLVs)												
		January	February	March	April	May	June	July	August	September	October	November	December	Total Production
		m ³	m ³	m ³	m ³	m ³	m ³	m ³	m ³	m ³	m ³	m ³	m ³	m ³
1	Um AL Nasser	21067	18793	22697	25525	26393	21792	17496	25828	25337	22338	18619	17349	263234
2	Beit Hanoun	274052	252325	303427	333780	432300	384962	380206	437053	415976	401147	332361	277289	4224878
3	Beit Lahia	424010	444604	520596	494751	611583	621424	563406	592529	621594	693329	604218	549670	6741714
4	Jabalia	1042669	995034	1117407	989337	1188657	1109798	1539837	1148445	1148445	1189513	1126236	1177650	13773027
5	Gaza	2659453	2646854	2711824	3069090	3388606	3242283	3150586	3284527	2877466	3347609	3213914	2933376	36525588
6	wady Gaza	12541	11747	13400	15915	16051	20456	20561	17269	19100	15438	13262	11579	187319
7	wady Salqa	10290	9210	14200	20570	25480	26720	34690	30050	30280	21190	14390	13630	250700
8	Al Moghraka	33480	33050	47990	57040	62050	70450	47806	47806	47808	59450	56670	48980	612580
9	Al Zahra	33916	37680	40070	68630	68626	63399	61396	73376	72181	70946	46420	47787	684427
10	Al Nussierat	329330	308350	438020	393780	398080	423290	359100	363190	465900	478050	412600	348040	4717730
11	AL Burij	154218	138275	127091	176120	173910	205747	209141	229124	200652	222913	155926	135261	2128378
12	Al Maghazy	101361	109831	139380	152739	153961	166240	177797	171817	139347	158041	110485	111648	1692647
13	AL Zawaida	65334	88714	79075	118547	145917	119142	153982	101797	116917	121977	117588	94042	1323032
14	AL Mossader	10834	11104	16701	15830	13819	34164	14822	24074	24074	15930	17157	16128	214636
15	Dair Al Balah	331348	335775	423954	462793	530803	478219	570723	450790	456281	500018	450531	417543	5408778
16	AL Qrara	83780	84609	90674	108006	130516	131953	134335	128647	127294	119921	107964	103772	1351471
17	Khanyounis	695049	693465	769484	807431	887634	857468	898544	865224	864608	901483	866395	776123	9882908
18	Bani Suhila	141990	128300	171070	162260	196700	211910	208100	218150	236110	199770	182020	137870	2194250
19	Abssan Al Kabera	106600	106600	101100	133600	132900	177200	153700	150330	160300	140500	123400	105000	1591230
20	Abssan Al Jadeda	20030	23953	26623	41903	46794	53308	51158	55948	51675	47779	39160	33905	492236
21	Khezaa	46128	43425	42782	60024	57495	67981	69752	65823	74275	48333	64910	35788	676716
22	Al Fukhary	22809	19157	21983	31032	33675	34699	36245	31594	34577	31939	28528	26959	353197
23	AL Nasser	28339	32574	31453	46319	42606	40634	49022	38487	45721	53876	35104	39277	483412
24	AL Shuka	51240	47150	52600	70030	41350	46320	53240	53240	69110	60190	63640	60690	668800
25	Rafah	688823	656983	757904	793841	826503	862838	860997	828993	927815	853984	803960	758952	9621593
Total Water Supply (m3)		7,388,691	7,277,562	8,081,505	8,648,893	9,632,409	9,472,397	9,816,642	9,434,110	9,252,842	9,775,664	9,005,458	8,278,308	<u>106,064,481</u>
Total Mekerot water supply (m3)		988,800	985,400	909,800	976,700	1,156,800	1,165,100	1,143,800	1,202,700	1,227,800	1,237,600	1,134,242	1,093,900	<u>13,222,642</u>
Total Water Supply (m3) water wells		6,350,810	6,231,953	7,075,237	7,554,652	8,338,566	8,127,651	8,478,511	8,065,285	7,817,307	8,354,330	7,692,170	7,000,971	<u>91,087,443</u>
Total Water Supply (m3) STLVs		49,081	60,209	96,468	117,541	137,043	179,646	194,331	166,125	207,735	183,734	179,046	183,437	<u>1,754,396</u>

Table 5 Total annual MEKEROT Water supply (Israel Line), (m3): Year 2020

#	Municipality	Monthly Mekerot Water Supply (m3) - Year 2020												Total Annual Mekerot supply 2020
		January	February	March	April	May	June	July	August	September	October	November	December	
		m ³	m ³	m ³	m ³	m ³	m ³	m ³	m ³	m ³	m ³	m ³	m ³	
1	Gaza	599500	595600	545100	637000	739700	674200	669600	702300	675400	743900	682000	692600	7956900
2	Al Nussierat	69600	52700	80700	83900	84700	87400	77800	70000	87900	86100	94000	93000	967800
3	AL Burij	66790	66350	26130	42170	35040	27720	40450	30640	28590	27390	31750	61920	484940
4	Al Maghazy	41910	51550	61570	56830	48960	54380	49150	68760	30690	47310	33492	34880	579482
5	AL Zawaida	0	0	0	0	0	0	0	0	15120	0	0	0	15120
6	Bani Suhila	85464	85178	90397	29936	91687	115329	109899	119091	157518	136021	119308	83893	1223723
7	Abssan Al Kabera	81095	85238	66422	76671	95501	131435	116382	121878	134073	121386	95639	82043	1207761
8	Abssan Al Jadedda	11675	16983	15251	23195	24857	30855	33036	39305	37998	37447	28134	21850	320587
9	Khozaa	32766	31801	24231	26998	36355	43781	47483	50726	60513	38046	49919	23714	466330
Total Mekerot Supply (m3)		988800	985400	909800	976700	1156800	1165100	1143800	1202700	1227800	1237600	1134242	1093900	13222642

Table 6 Total annual STLVs production (m3): Year 2020

#	Facility Name	Monthly STLVs water Production (m3) - Year 2020												Total Annual STLVs production 2020
		January	February	March	April	May	June	July	August	September	October	November	December	
		m ³	m ³	m ³	m ³	m ³	m ³	m ³	m ³	m ³	m ³	m ³	m ³	
1	Gaza Seawater Desalination plant	2996	533	34490	60138	91452	123179	138786	121203	137898	128473	137424	143355	1119927
2	Dair Al Balah Seawater Desalination plant	17665	23046	26463	20998	11106	18109	27000	21212	39518	21434	0	0	226551
3	Southern Seawater Desalination plant	28420	36630	35515	36405	34485	38358	28545	23710	30319	33827	41622	40082	407918
Total Supply (m3)		49,081	60,209	96,468	117,541	137,043	179,646	194,331	166,125	207,735	183,734	179,046	183,437	1,754,396

Table 7 Total Annual Water Supply from different sources – Year 2020

#	Water Supply Categories	Monthly Water Supply (m3) - Year 2020												
		January	February	March	April	May	June	July	August	September	October	November	December	Total Annual supply 2020
		m ³	m ³	m ³	m ³	m ³	m ³	m ³	m ³	m ³	m ³	m ³	m ³	m ³
1	Total production m3- water wells	6350810	6231953	7075237	7554652	8338566	8127651	8478511	8065285	7817307	8354330	7692170	7000971	91,087,443
2	Total Mekerot water supply - m3	988800	985400	909800	976700	1156800	1165100	1143800	1202700	1227800	1237600	1134242	1093900	13,222,642
3	Total production m3- STLVs	49081	60209	96468	117541	137043	179646	194331	166125	207735	183734	179046	183437	1,754,396
Total Monthly Water Supply (m3)		7,388,691	7,277,562	8,081,505	8,648,893	9,632,409	9,472,397	9,816,642	9,434,110	9,252,842	9,775,664	9,005,458	8,278,308	106,064,481

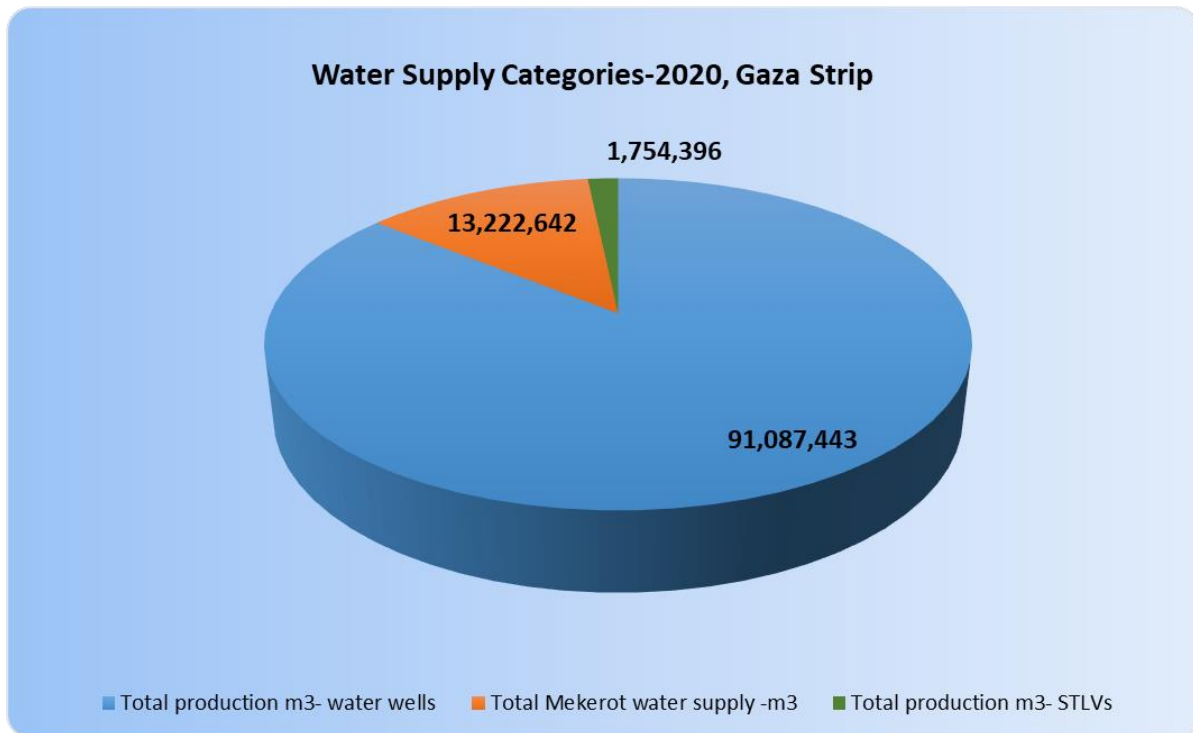


Figure 3: Total annual water supply (m3) January-December 2020

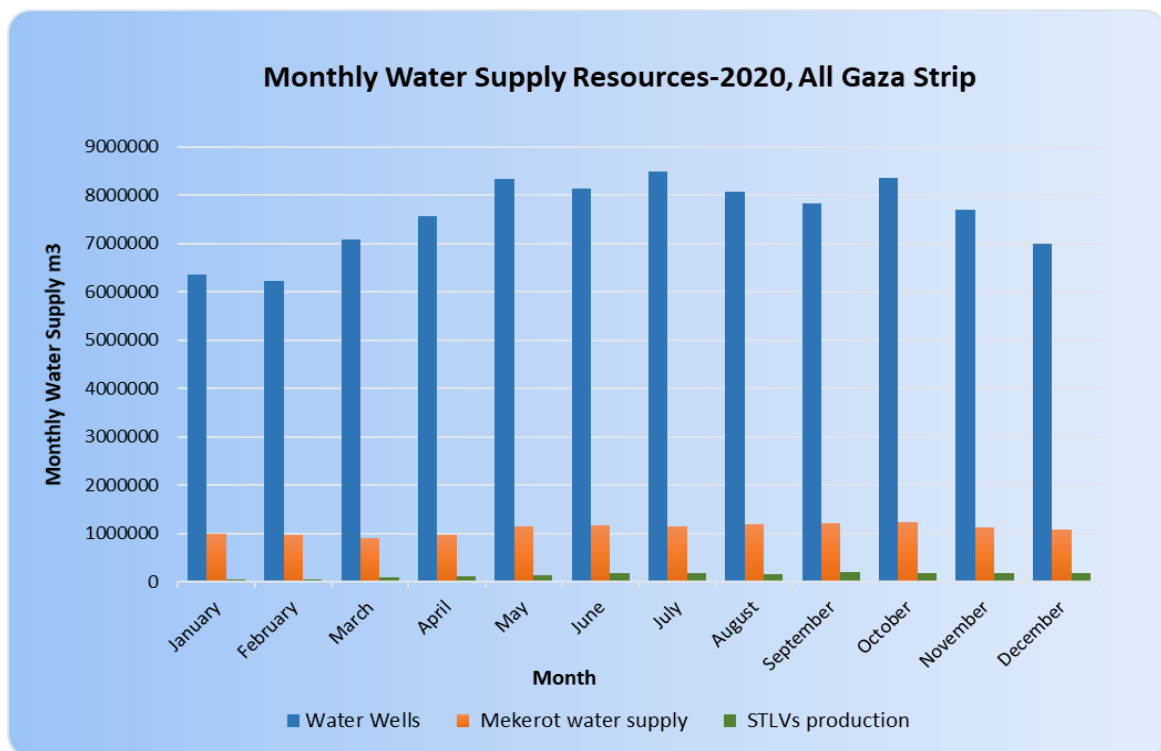


Figure 4: Total annual Production (m3) January-December 2020

Mekerot Water Supply -2020, Gaza Strip

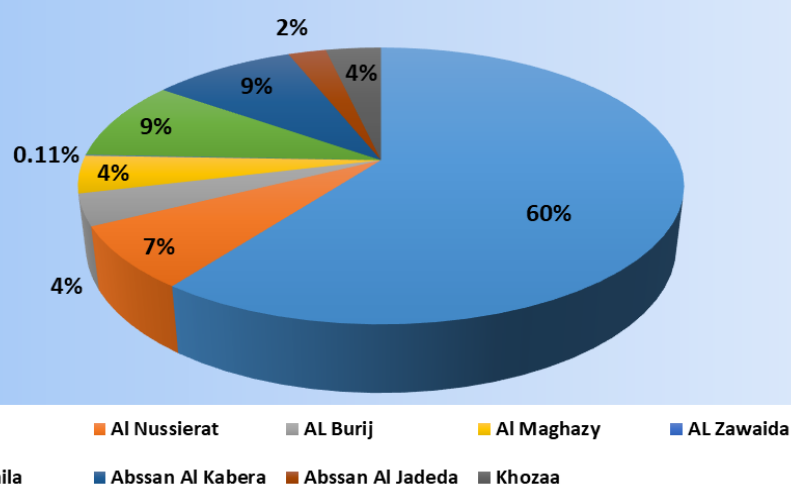


Figure 5 Mekerot water supply as per municipality - 2020

Table 8: Water Quota L/C/D-: January-December 2020

No.	Municipality	Annual Water Production from water wells	Annual Water supplied from Mekerot (Israel Co.)	Annual Water supplied from STLVs	Total Annual Water supplied from different resources	served Population	UFW	Total Annual Water Consumption	Daily Water Consumption Rate (Quota)	Daily Water Production Rate (Quota)
		m ³	m ³	m ³	m ³	Capita	%	m ³	liter/c/day	liter/c/day
1	Um Al Nasser	263234			263234	5180	8.09%	241947	131	142
2	Beit Hanoun	4224878			4224878	57118	38%	2628442	129	207
3	Beit lahia	6741714			6741714	98233	59%	2790130	79	192
4	Jabalia	13773027			13773027	267951	39%	8440601	88	144
5	Gaza	27448761	7956900	1119927	36525588	744426	43.80%	20529092	77	137
6	Wady Gaza	187319			187319	4891	27.61%	135601	78	107
7	Al Moghraka	612580			612580	12219	59%	251744	58	140
8	Al Zahra	684427			684427	8500	35%	441976	142	221
9	Al Nusseirate	3749930	967800		4717730	93273	40%	2846092	85	141
10	Al Buriij	1643438	484940		2128378	46869	37.82%	1323493	79	127
11	Al Maghazy	1113165	579482		1692647	29972	48.12%	878064	82	158
12	Al Zawaida	1307912	15120		1323032	25679	42%	768176	84	144
13	Al Mussader	214636			214636	2786	51%	105537	106	215
14	Deir Al Balah	5182227		226551	5408778	88447	59%	2225982	70	171
15	Wady Al Salqa	250700			250700	7233	23.42%	191994	74	97
16	Al Qrara	1351471			1351471	31425	31.64%	923826	82	120
17	Khanyounis	9670723		212185	9882908	266871	30%	6938699	73	104
18	Bani Suhila	970527.47	1223722.53		2194250	44899	28%	1581086	98	137
19	Abssan Al Kabera	383469.29	1207760.71		1591230	29002	20%	1278824	123	153
20	Abssan Al jadedda	171649.09	320586.91		492236	10066	28.47%	352120	98	137
21	Khezaa	210386.15	466329.85		676716	12339	14.99%	575308	130	153
22	Al Fokhary	353197			353197	8500	30%	248106	82	116
23	Al Nasser	483412			483412	9973	13%	422098	118	136
24	Al Shuka	668800			668800	17769	45%	366367	58	105
25	Rafah	9425860		195733	9621593	225227	34.36%	6315459	78	119
Total (m ³)		91,087,443	13,222,642	1,754,396	106,064,481	2,148,848	40.8%	62,800,764	82	138

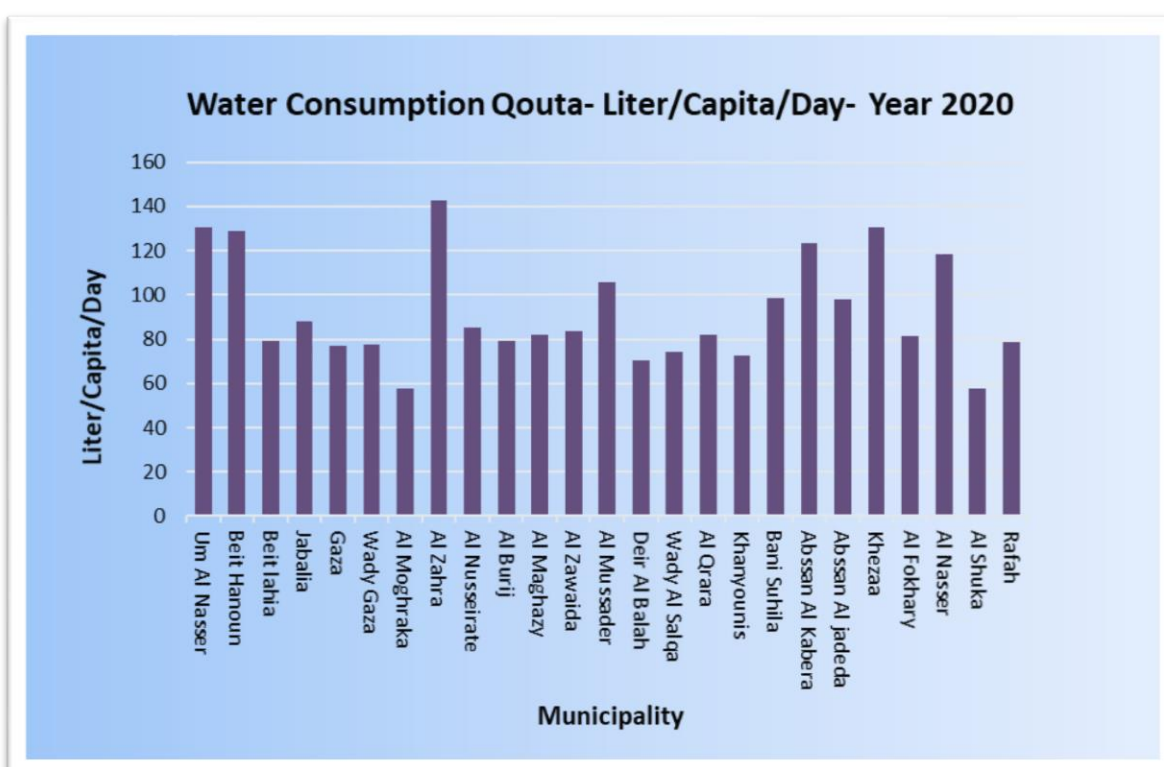
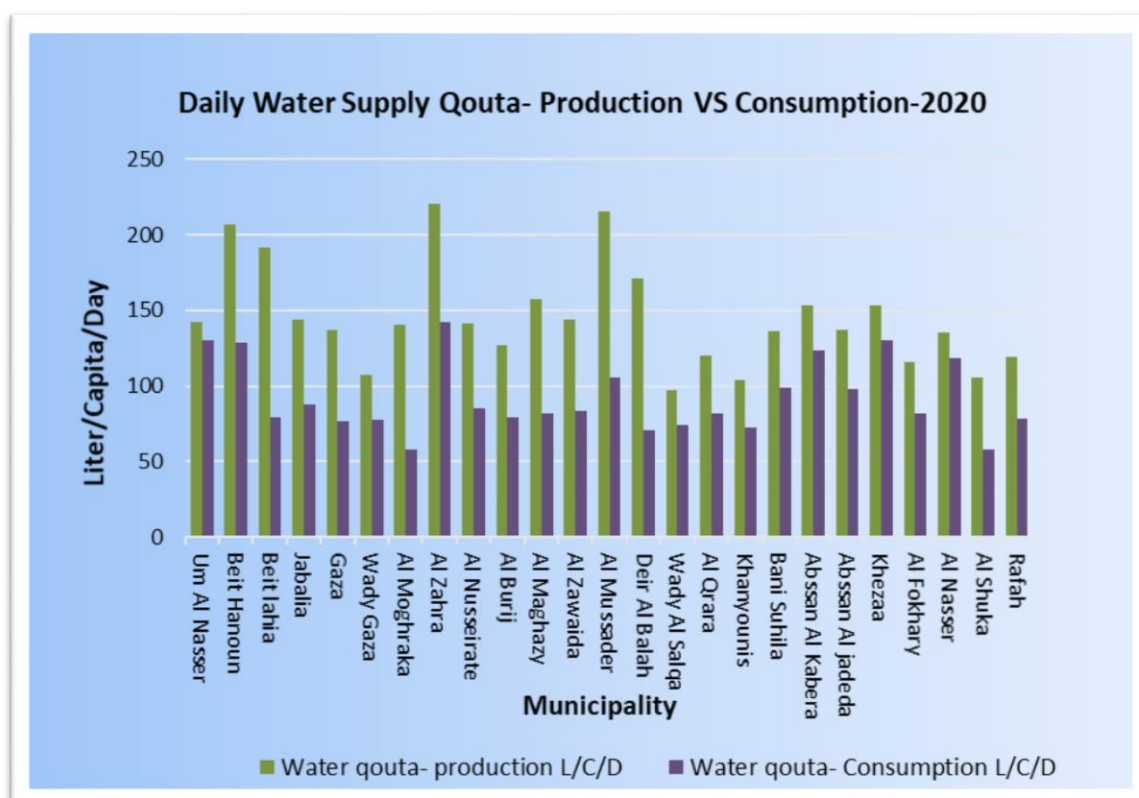


Figure 6 Municipal Water Supply Quota L/C/D: January-December 2020

A.2 Improve Water Facilities

1- Construction New Water Wells

In coherence with the PWA national plan to reallocate, resizing, and closing some designated water wells throughout the Gaza Strip in order to decrease water abstraction from the aquifer and improve the water quality as well; CMWU during the past three years stopped proposing any new construction for water wells and all interventions are limited to maintain and rehabilitate the existing wells or reallocate some damaged or malfunctioned ones, besides completion the construction of some low production water wells to replace the closed wells with high production rates

- Construction of Rafah water well (adjacent to the ground water tank), the project is completed and the well is operational now, the project is financed by Oxfam through PEF
- Recently, and through Qatar Charity ; two tenders have been launched for reallocation two water wells in Rafah and Khan Younis, the tenders are still under evaluation and the works will start in February 2021
- Construction of 3 wells at different areas in Rafah with low production rate 45 m³/hr in order to decrease the abstraction from other wells , the project has started, it is financed by Kuwaiti Palestinian Association



Figure7: Construction Water Wells at Rafah

2. Electrical Refurbishment, Upgrading and Repairs Installations

CMWU has continued to carry out and manage all electromechanical works and installations required to improve the functionality of the water wells and other associated systems providing for optimum operating and maintenance conditions. This will secure and safeguard the water productivity level over different seasonal periods of demand and throughout regional areas.

CMWU has continued its strategy towards the electrification of all newly constructed water wells and other water facilities e.g. water tanks with booster stations, desalination plants and some of existing wells by connecting them to the public electricity gridlines, all in coordination with Gaza Electricity Distribution Co. (GEDCO) and PWA. The electrification activities include the followings:

- The installation of both high- and low-tension electrical grid lines with all associated transformers for some water facilities have been already initiated while there are still other facilities waiting the materials entry to Gaza Strip in order to complete connecting all the facilities with electricity.
- Supply and install 2nd electricity power lines for critical water and wastewater facilities (Sewage pumping stations, water reservoirs and booster stations), whereas new four facilities have become electrified by second electricity feeder from GEDCO in addition to the previous facilities which will be electrified during emergency and hostilities conditions. This program is funded by ICRC to enhance operational readiness under emergency preparedness plan EPP established for water sector in Gaza strip.
- Provide and install automation and SCADA equipment and connections for more than 100 sites of water facilities which are located at the remote areas, and this will secure the water services and facilities operations' needs during hostilities without human interference, so far 60 water wells sites have a SCADA system using SMS media to complete control with facility without any human intervention.
- Supply and install some standby power supply generating sets at various water wells and pumping sites to overcome the problems of electricity cut-offs which occur daily in Gaza strip.

Due to unavailability of spare parts resulting from continual security control by Israel authorities over the materials supplied across the borders and dual use classification, severe shortages of essentially required spare parts have been encountered. Due to this process CMWU still facing problems in transferring materials to Gaza especially the electrical materials like all types of power and control cables, soft starters, variable speed drives, electrical and electronic instruments.... etc. Fortunately, some of the required materials were available at CMWU main warehouse, and have been used for electrical repairs and maintenance works in several water and waste water facilities during the past year. Therefore, more than 100 job orders have been issued either for rectifying or repairing some damages or to apply the routine and corrective maintenance in the water facilities. The main repair and maintenance work during the year 2020 are classified to upgrading, rehabilitation up to development works summarized here below:



Figure 8: electrical upgrading works

Upgrading Works:

Table 9 summarizes the upgrading works during 2020

Upgrading electrical works-2020			
#	Municipality	Location	Description of Works
1	Rafah	Jemazat Sabeel P.S	Supply, install and program new PLC Siemens to operate the pumps Automatically
2	Khanyounis	Hesbaet Samak P.S	Supply, install and program new PLC Siemens to operate the pumps Automatically
3	Bany Suhaila	Main PS	Supply, install and program new PLC Delta
4	Beit Lahia	Amer P.S	Supply, install and program new PLC Delta
5	Beit Lahia	Aslan 4	Supply, install and program new PLC Delta
6	Jabalia	Mahader	Supply, install and program new PLC Delta includes rehabilitation of the existing electrical Panel
7	Bani Suhila	Sewage Pump Station	Supply , install and program new PLC Delta
8	Rafah	Al Shouth D.P	Supply and install 4x400A ATS motorized
9	Beit Lahia	Shaikh Zaid Well	Supply and install 4x400A ATS motorized
10	Dear El Balah	Bassa DP	Supply and install 1.5 KWHP Solar system to keep on the sensitive equipment with power supply on time to avoiding and failure for the operating system due to electricity cutoff.
11	Dear El Balah	Berka D.P	Supply and install 1.5 KWHP Solar system to keep on the sensitive equipment with power supply on time to avoiding and failure for the operating system due to electricity cutoff.
12	Rafah	Block O PS	Supply and install 1.5 KWHP Solar system to keep on the sensitive equipment with power supply on time to avoiding and failure for the operating system due to electricity cutoff.

13	Rafah	Zohoor Boster	Supply and install 1.5 KWHP Solar system to keep on the sensitive equipment with power supply on time to avoiding and failure for the operating system due to electricity cutoff.
14	Bany Suhaila	InterPal D.P	Supply and install 1.5 KWHP Solar system to keep on the sensitive equipment with power supply on time to avoiding and failure for the operating system due to electricity cutoff.
15	Bany Suhaila	Eastren D.P	Supply and install 1.5 KWHP Solar system to keep on the sensitive equipment with power supply on time to avoiding and failure for the operating system due to electricity cutoff.
16	Beit Lahia	Amer P.S	Supply and install Ultrasonic level Controller to obtain sustainable and durable operation scheme.
17	Dear El Balah	Berka PS	Supply and install Ultrasonic level Controller to obtain sustainable and durable operation scheme.
18	Wadi Gaza	Wadi Gaza PS	Supply and install Ultrasonic level Controller to obtain sustainable and durable operation scheme.
19	Beit Lahia	Aslan 5	Supply and install Ultrasonic level Controller to obtain sustainable and durable operation scheme.
20	Jabaliala	Abu Rashed PS	Supply and install 2 No. of Ultrasonic level Controllers, one of them for the wastewater pump station and the other one for storm water pump station
21	All Municipalities	water and wastewater facilities	Several routine and urgent maintenance in several water and wastewater facilities

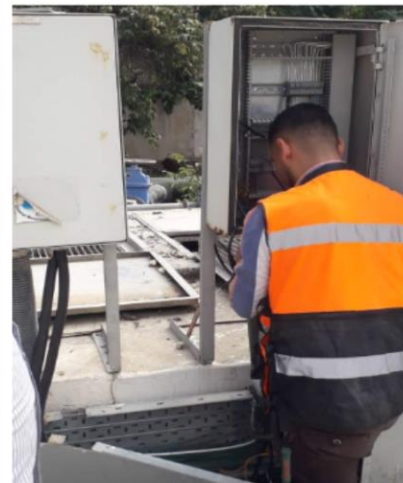
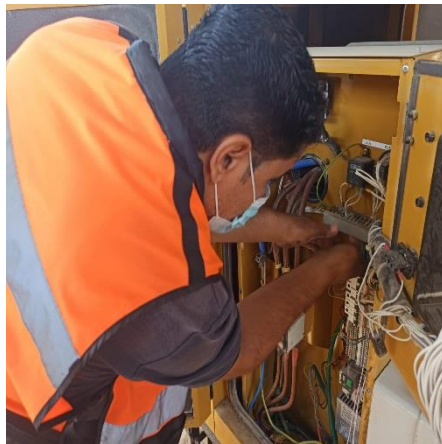


Figure 9 Part of upgrading and maintenance works

Development Works:

The works to develop the WASH facilities targeted the water facilities by Automation and SCADA operation and provide second electrical power feeder or PV solar systems.

Automation and SCADA

- Automation and SCADA system targeted 59 water wells. The aim of this work is to avoid operational risks during war and to develop SCADA operation in the future.
- The targeted wells are distributed over all municipalities as shown in below table
- In this stage of installation, the entire SCADA system shall be purposely driven by mobile message to access facility for operation and monitoring until getting modular and sustainable system which will include master control room at CMWU and other branches at municipalities and regional offices .



Figure 4 Part of SCADA Works

Table 10: list of water well equipped with SCADA

No.	Municipality	Facility /well Name
1	Beit Hanoun	Jeneen well ,AL Sultan well , Salah well ,Sinaiya well, Al Shawwa well
2	Beit lahia	Atatra well, Shaymma well, Besan well, Ghaben well, Nozha well
3	Jabalia	Asaliya well, Fatih well, Al Shifaa well, Al Hissi well
4	Wadi Gaza	well no.02
5	Nussirat	UNRWA, F208,G56
6	Maghazi	S82,S80, S71, UNRWA
7	Mussaddar	Musaddar well
8	Burij	Al Jazair well, Maqbola well
9	Wadi Al Salqa	Western well, Eastern well
10	Dair Al balah	Mutarid well, Muntazah well, Tarazi well, Al lahham well, Al Balad well, Sahel 5 well, Sahel 6 well, Berka well
11	Bani Suhila	Tika well
12	Khan Younis	Hammad 1 well ,Hammad 2 well ,Hammad 3 well Al Tahliya well, Kuwaiti well, Berika well
13	Qarara	Abu Maraziq well, Matahen well ,Elyoon well
14	Al Nasser	Qatar well
15	Al Fakhary	Al Fakhary 1 well , Al Fakhary 2 well
16	Al Shoka	Malizy well
17	Rafah	UNDP, TRC3,Merag well ,TRC2, TRC 1, Sekka well148 well, Saffa well, Al Hashash well, Abu Zohry well,

Second Electrical Feeder

14 facilities have become electrified by second electricity feeder from GEDCo and the work is ongoing to install the second feeder for **18** facilities. This program is funded by ICRC to enhance operational readiness under emergency preparedness plan EPP established for water sector in Gaza strip.

Table 11 : list of facilities that have two electrical feeders or permanent feeder.

No.	Facility	type	Municipality	Implementation of Second Power Line
1	Eskan water well	Water well	Rafah	Done
2	PWA water well	Water well	Rafah	Done
3	Saudi water booster No.1	Water Reservoir	Rafah	Done
4	Saudi water booster No.2	Water Reservoir	Rafah	Done
5	Water well 124	Water well	Rafah	Done
6	Tal al Sultan P.S.	Sewage P.S.	Rafah	Done
7	Fawaida P.S.	Sewage P.S.	Gaza	Done
8	Salateen Well	Water well	Bait Lahia	Done
10	Sewage PS6A (Al-Samr)	Sewage P.S.	Gaza	Done
12	Aslan 4 sewage pumping station	Sewage P.S.	Bait Lahia	Done
13	Hawaber P S	Sewage P.S.	Jabalia	Done
14	Ground water booster No.1	Water Reservoir	Rafah	Done
15	Ground water booster No.2	Water Reservoir	Rafah	Done
16	Canada water booster No.1	Water Reservoir	Rafah	Done
17	Canada water booster No.2	Water Reservoir	Rafah	Done
22	Al Hassaina P.S	Sewage P.S.	Nusirate	In Progress
23	Abu Tuaima Reservoir	Water Reservoir	Abasan Al Kabira	In Progress
24	New Jenin well	Water Well	Bait Hanoon	In Progress
25	Al Izba well C127A	Water Well	Bait Hanoon	In Progress
26	Hatabia WWPS	Sewage P.S.	Bait Lahia	In Progress
27	S103 well	Water Well	Al Maghazi	In Progress
28	Musader well	Water Well	Al Musadar	In Progress
29	Maghazi new water well - Municipality well	Water Well	Al Maghazi	In Progress
30	Wadi Salqa Well T52	Water Well	Wadi Al Salqa	In Progress
31	Well No. 12	Water Well	Gaza City	In Progress
32	Well No. 15	Water Well	Gaza City	In Progress
33	Well No. 16	Water Well	Gaza City	In Progress
34	Zimmo Well	Water Well	Gaza City	In Progress
35	Khuza'a New Reservoir	Water Reservoir	Khuzaa	In Progress
36	Abasan El-Kabira Reservoir - Al Sanati	Water Reservoir	Abasan Al Kabira	In Progress
37	Abasan Al Kbera - Al Faraheen Booster	Water Reservoir	Abasan Al Kabira	In Progress
38	Shoka Anera Reservoir	Water Reservoir	Al Shoka	In Progress
39	Batool reservoir	Water Reservoir	Al Fukhary	In Progress

Photovoltaic solar Renewable Energy

During 2020 different WASH facilities have been provided with PV solar energy through different donations in order to improve the operational conditions in terms of increasing the operation hours and decrease the O&M cost related to the consumed fuel, electricity and generators' repairs. Also, donors like EU, KFW , UNICEF are committed to implement PV systems during 2021 – 2022 to other WASH facilities.

- Providing 4 water tanks in Gaza city (Al montar, civil defense, Sheikh Radwan and Al Safa), with PV solar systems, 460 KW is generated for the 4 sites, project is completed, it is financed by UNICEF



Figure 10 PV systems installed

- The CMWU in cooperation with PWA will provide 6 WASH facilities with PV solar energy, the project is financed by KDF through UNICEF. The consultancy services tender was awarded, and the consultant is currently preparing the design and tender documents for PV activity to be launched early 2021
- Providing 6 brackish RO plants with PV solar system, the project is ongoing, it is financed by EU through Oxfam.



Figure 11 PV systems installed

- Providing 10 brackish RO plants with PV system, the project is ongoing and financed by AAH
- Under energy management program funded by KFW, a consultancy services has been launched during 2020 in order to develop the detailed design and tender documents for energy program activities which include (equipping many of water and wastewater facilities with PV solar energy, pumps' replacement, installation of VFD devices....etc) besides reconfiguration of the wastewater pumping system in Gaza city

3- Mechanical Refurbishment, Upgrading and Repairs Installations

During the period of this report from January to December 2020, several mechanical refurbishment repairs, upgrading works and repair installations have been continued to be managed and carried out at various operating water facilities .Purpose has been applied to keep the existing and the new water installations functioning well to cover service demands especially during COVID-19 outbreak in addition to improving the level of reactivity towards some operational constraints such as unreliable power supply and shortages of spare parts and fuel supplies. Besides carrying out and on time reactions with all programmed inspections and preventive maintenance requirements for all water sites with all associated minor repairs and adjustment works; the regular continuous repairs and maintenance works besides major upgrading works have been provided and completed for several water wells, water tanks and pumping water sites listed here below:



Figure 12 upgrading of Al Mashrooa water well



Figure13: Rehabilitation of Al Sabra water well-Gaza city

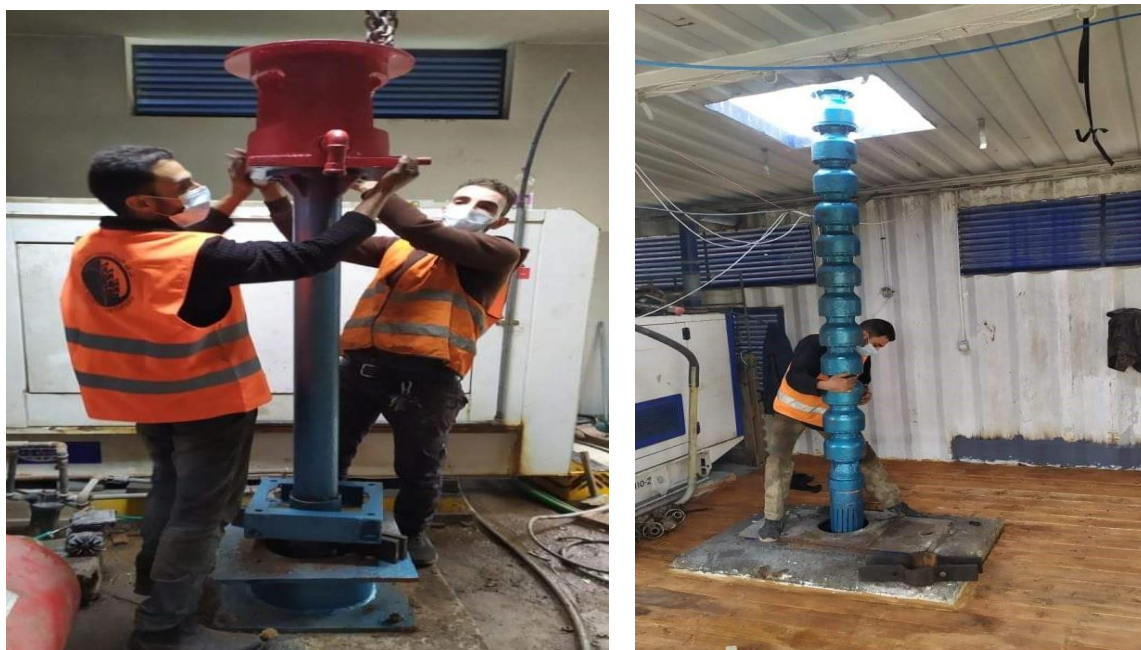


Figure14: Rehabilitation of Al Matar well-Rafah



Figure15 Beit Hanoun water well



Figure 16 UNRWA water well-Khan Younis

table 12 List of upgrading works at water facilities

Item	Well Name	Municipality	Description
1	Al-Shoka boosters	Al-Shoka	Maintenance work of Al-Shoka booster pump (Anera tank)
2	G-50 Well	Al-Zahra	Rewinding of 30 HP electric motor, bearings & maintenance of gland box
3	Al-Aqsa tank	Deir El-Balah	Maintenance work for booster pump
4	STLV6,000 BW1	CMWU	Assemble of submersible motor
5	G-49 Well	Nusairat	Rewinding of 30 HP electric motor & bearing & Maintenance of whole pumping unit
6	F-208 Well	Nusairat	Rewinding of 60 HP electric motor& bearings & maintenance of gland box
7	P-124 Well	Rafah	Maintenance work for whole pumping unit & bearing for 150 Hp electric motor

8	N-22 Well	Abasan Khabira	Maintenance work for the whole pumping unit
9	P-138 Well	Rafah	Maintenance work for the whole pumping unit
10	AL-Malezi Well	Beit Lahia	Repair of gland box
11	AL-Awqaf Well	Beit Hanoon	Repair of gland box
12	Al motared Well	Deir El-Balah	Maintenance work for the whole pumping unit
13	Khaled Ben Waleed Well	Al-Zawaida	Maintenance work for the whole pumping unit, rewinding of 40 Hp Electric Motor with bearings
14	Maqbola Well	AL-Burij	Dismantle and reassemble after installing a new motor
15	A 210 Well	Um Alnassir	Maintenance work for the whole pumping unit+ rewinding & bearing for 60 Hp elect motor
16	Al Najjar Well	Bani Suhaila	Maintenance work for whole pumping unit, supply and install fittings
17	Almusadar booster pump	AL-Musadar	Maintenance work for mechanical seal
18	Eastern Tank booster Pumps	Bani Suhaila	Maintenance work for the pump, gland box and replace bearings
19	Southern Un Well	Khanyounis	Maintenance work for vertical pumping unit
20	Forqan Well	Nusairat	Supply and install Cyclone 4"
21	Breikah Well	Khanyounis	Supply and install Cyclone 6", ARV2" with valve
22	Asalia Well	Jabalia	Maintenance works for whole pumping unit
23	Saudi Tank	Rafah	Rewinding of 150 HP elect motor& bearings.
24	Rahma Tank	Khanyounis	Repair of Gland box
25	Maan Tank	Khanyounis	Repair of Gland box
26	Ghaben Well	Beit Lahia	Rewinding of 100 HP electric motor & bearings.
27	Nama well	Beit Lahia	Supply and install NRV 4"
28	AL-Malezi well	Al-Shoka	Maintenance works for whole pumping unit
29	A-229 well	Um Alnassir	Dismantle, check and repair the damage in the pump

30	Al Tahlia well	Bani Suhaila	Maintenance works for the whole pumping unit
31	Al kawthar Tank	Al-Moghraqa	Rewinding of two 75 HP electric motor& bearings, Mechanical maintenance for the pumps.
32	Al Kweiti well	Khanyounis	Maintenance works for whole pumping unit, supply and install cyclone 6" and fittings
33	AL Montazah well	Beit Lahia	Supply and install cooling fan for motor, repair of gland box
34	Al Rahma well	Khanyounis	Rewinding of two 75 HP electric motor & bearings.
35	Turkish well	Al-Nasser	supply and install Tee to connect the well with network
36	RO Plant DP	AL Waffa Hospital	Maintenance work include supply fitting, S.S pipes, cartridge filters and feed pump 316L 2HP for desalination plant
37	Al Saada DP	Khanyounis	Supply and install solenoid valve S.S316L 2"
38	AL Intisar well	Nusairat	Maintenance works for whole pumping unit
39	AL Waldeen well	Khanyounis	Electromechanical maintenance for pumping unit
40	T-52 well	Wadi Al-Salqa	Electromechanical maintenance for pumping unit, supply and install a completely new manifold with fittings and bearings for motor
41	Khaled Ben Waleed Well	Al-Zawaida	Supply and install mechanical fittings and electrical check and repair of existing MDB
42	L-179 well	Al-Qarara	Supply and install a completely new manifold with fittings
43	Awqaf well	Beit Hanoon	Supply and install Pressure switch and chlorine dosing pump, Sand blasting the manifold
44	P-148 well	Rafah	Mechanical Maintenance works for pumping unit
45	Eastern well	Wadi Gaza	Mechanical Maintenance works for pumping unit
46	Soqia Al Khalil well	AL-Maghazi	Supply and install a complete new Chlorine dosing unit
47	Old UN Well	AL-Maghazi	Supply and install a complete new Chlorine dosing unit
48		CMWU	Rewinding of 8 elect motor & bearings with different sizes.
49		CMWU	Supply new 10 dosing pumps to CMWU stores
50	J-5 well	Deir El-Balah	Rewinding of 50 HP electric motor & bearings.

51	Fire Fighting Pump	CMWU	Mechanical Maintenance works for pumping unit and mechanical seal
52	T-52 well	Wadi Al-Salqa	Supply and install steel pipes 6" for pump
53	Khuzaa DP	Khuzaa	Mechanical maintenance of the DP and supply fitting
54	P-138 Well	Rafah	Supply and install hydro cyclone 6"
55	Canada Tank	Rafah	Supply and install new discharge head 10/10"
56	Abu Shariekh Garbi	Jabalia	Mechanical Maintenance of whole pumping unit
57	Sheikh Zayed well	Beit Lahia	Supply and install mechanical fittings, Repair 250KVA generator, electrical installations
58	Remal 7 well	Gaza	Mechanical Maintenance of whole pumping unit and rehabilitation of the container
59	Sabra2 well	Gaza	Mechanical Maintenance of whole pumping unit
60	J-4 well	Deir El-Balah	Mechanical Maintenance of 65KVA generator
61	TRC1 well	Rafah	Maintenance works for the whole pumping unit & supply and install steel pipes 4" Dia.
62	Cultural center well	Khanyounis	Maintenance works for the whole pumping unit
63	Northern UN well	Khanyounis	Dismantle, assessment and prepare the pumping unit for future maintenance
64	Islamic Relief well	Khanyounis	Dismantle, assessment and prepare the pumping unit for future maintenance
65	Aqsa well	Nusairat	Supply and install chlorine dosing pump
66	Shawqi well	Deir El-Balah	Supply and install chlorine dosing pump
67	Basheer well	Deir El-Balah	Supply and install chlorine dosing pump
68	Kalabosh well	Nusairat	Supply and install chlorine dosing pump
69	Municipality well	AL-Maghazi	Supply and install chlorine dosing pump
70	AL muntazah	AL-Maghazi	Supply and install chlorine dosing pump
71	Al Salah well	Beit Hanoon	Supply and install Pressure switch and chlorine dosing pump
72	Abu Naser well	Deir El-Balah	Supply and install chlorine tank

73	Municipality DP	Almoghraqa	Mechanical maintenance of the DP and supply fittings
74	Southern UN Well	Khanyounis	Drilling of new 12" borehole and mechanical maintenance and upgrading of the pumping unit
75	A 210 Well	Um Alnassir	Sand blast and paint the manifold, supply and install flow meter 6" and fittings
76	AL Nada well	Beit Hanoon	Sand blast and paint the manifold
77	Al Farooq well	Nusairat	Sand blast and paint the manifold
78	Al motared Well	Deir El-Balah	Sand blast and paint the manifold, supply and install new cyclone 4", ARV2" and ball valve 2"
79	W.S Well	Wadi Al-Salqa	Supply and install Gate valve 4" with accessories.
80	Shuhada albaladia well	AL-Burij	Supply and install chlorine dosing pump, supply and install fittings
81	S-72 well	AL-Burij	Supply and install chlorine dosing pump
82	AL Hessi well	Jabalia	Supply and install flow meter 4", Sand blast and paint the manifold
83	Nazla well	Jabalia	Supply and install fittings
84	Aslan& AL kelani wells	Beit Lahia	Supply and install fittings
85	Fukhari well	AL-Fukhari	Supply and install fittings
86	AL-Malezi well	Al-Shoka	Supply and install fittings
87	Awqaf, Al slalah, AL khazan wells	Beit Hanoon	Supply and install fittings
88	Turkish well	Al-Nasser	Maintenance of the whole pumping unit, supply and install upper and lower bearings for electric motor, supply and install NRV6" and G.V 6"
89	STLV 6,000 Permeate water pump	CMWU	Maintenance of the whole pumping unit

The repair records show that more than **200** predictive, preventive and corrective maintenance job orders were carried out and applied at various areas. While, the registry of major mechanical & electrical repairs, and maintenance job orders reached **110** of various repairs.

In addition to all the above-mentioned activities the **Mobile mechanical maintenance and repair workshop** also implemented list of activities to assure the services continuity such as:

- The mobile mechanical service maintenance unit established by CMWU continues to provide all metal works repairs for various municipal water wells and other facilities including specialized pipelines connections which used to be repaired in the past by private services contractor.
- Mechanical repairs and refurbishment of 15 water pumping manifolds for both water and wastewater pumping stations.
- Repair and adjustment of 23 water meters for water wells exits
- Mechanical repair of water distribution valves on the network throughout all operating areas of Gaza strip; 32 job orders.
- Carry out 19 mechanical repairs and preventive maintenance activities for south Gaza STLV sea water RO desalination plant.
- Carry out several water and wastewater networks repairs, replacement and reconnection work at various CMWU operational areas along Gaza strip.



Figure 17 Part of mobile mechanical maintenance and repair workshop activities

4- Fuel Distribution

Despite of electricity scarcity and unreliability in Gaza strip and having regards to slight improvement of grid supply this year, but still electrical power deficit reaches more than 50% compared with demand requirements, which continue to affect water and wastewater services provisions in Gaza strip. Since November 2018, all emergency Diesel fuel supply programs from different donors were stopped assuming that the slight improvement of grid electricity enough to mitigate the risks, leaving services under threatening conditions.

All activities and programs of rehabilitation and upgrading electrical and mechanical works; besides the slight improvement of grid electricity supply this year have significantly contributed to safeguard acceptable level of services, and positively impacted the water wells functionality. Despite, the continual and endless prevailing socioeconomic and politically unstable conditions with unreliable electricity power supply and shortages of spare parts and materials for repair which had heavily and severely affecting back up electricity generators and created lots of repairs and maintenance needs and parts, CMWU had continued to manage the services under pressure and protecting environmental and health life aspects. Hereunder the achieved targets details.

A.3 Improve Water Wells Functionality

The functionality of Water Wells indicator aims to make sure that all breakdowns of water production wells in Rafah Area, Khan younis Area and Middle Area to be rectified in a very short time to achieve the satisfaction of the water customers in those areas. The functionality and readiness of the water production wells will be measured on monthly basis by measuring the efficiency of the water well functionality in each area:

$$\text{Water Well functionality Efficiency} = \frac{\sum Q_w * D_w}{(\sum Q_w) * D_m}$$

Where:

Qw: flow rate of each well.

Dw: No. of working days of each well in the month

Dm: No of days of the month

Water wells operating hours have been managed and recorded as per operational registry data-base representing the tool of measurement for the actual level of serviceability and functionality. The records of each water well pumping facility against breakdown and repair down time hours have been traced and calculated for the targeted period from which the annual target of functionality efficiency for year 2020 has reached its targeted level of 98.25 % which express the high level of operational readiness for water wells.

It is worth to note that the availability of wells is measured and expressed in functionality efficiency, which is subject to the time, consumed (operating hours) to carry maintenance and repair activities for the whole targeted sites under normal conditions.

Despite the continuation of several operational constraints and difficulties by having unreliable electricity power supply from grid lines and shortages of spare parts and fuel supplies, CMWU team work with high level of determination has relatively succeeded to manage on time repairs and maintenance requirements. This reduces the negative impact of faults and breakdown events and safeguards the level of functionality for water wells which represent the major source of water in Gaza strip. Also, it is worth to mention that the collaborative efforts exerted by O&M team work to reach this level of cooperation with the abnormal situation are remarkable and unique.

The operational availability time for each well was kept secured and ready for operation as per the water demand at various regions. The repair records show that there are no more than two sites of water production wells at the same time out of service waiting for repair or refurbishment.

The monthly monitoring program of water wells functionality measured throughout the services targeted Southern and Middle areas for the year 2020 has been illustrated here below. Despite of catastrophic electricity deficit, which continued to occur during this year and its negative impact on the sequential occurrence of faults and number of repairs, the functionality efficiency and the overall annual target of 98.25% is achieved.

Table 13 The monthly water wells functionality efficiency -Middle and South Governorates -YEAR 2020

Month	Regional Area	Total No of working hours of all Wells	Monthly Water Production	Sum of flow rates of all wells (QW)	total No. of working days of all wells (Dw)	weighted value	Wells Functionality Efficiency	Monthly Functionality Efficiency
		hour	m ³	m ³ /hr		Qw* Dw	%	%
January	Khan Youins Area	11654	849759	2781	1212	81857	98.13%	98.29%
	Middle Area	12839	825911	3843	1825	113225	98.21%	
	Rafah area	7608	695495	1662	626	49141	98.54%	
February	Khan Youins Area	11504	842824	2616	1102	76312	97.25%	97.83%
	Middle Area	13340	878343	3384	1898	99949	98.45%	
	Rafah area	7026	664715	1663	613	48796	97.79%	
March	Khan Youins Area	13072	945428	2225	1110	65027	97.42%	96.54%
	Middle Area	17200	1153182	3359	1781	95313	94.60%	
	Rafah area	8310	737539	1535	642	44946	97.59%	
April	Khan Youins Area	14888	1054627	2841	1267	83650	98.16%	98.36%
	Middle Area	18037	1269902	3708	1896	109819	98.72%	
	Rafah area	8696	776946	1729	649	50941	98.21%	
May	Khan Youins Area	17939	1240380	2771	1305	80814	97.23%	98.27%
	Middle Area	21812	1406685	3708	1887	109571	98.50%	
	Rafah area	9481	809928	1718	653	51062	99.08%	
June	Khan Youins Area	16834	1201391	2984	1331	88362	98.72%	98.54%
	Middle Area	21335	1440348	3951	1884	116293	98.11%	
	Rafah area	9400	844760	1836	649	54414	98.79%	
July	Khan Youins Area	17084	1218819	3003	1310	89523	99.36%	98.40%
	Middle Area	20536	1431209	3992	1892	117981	98.51%	
	Rafah area	10145	847622	1697	610	49554	97.33%	
August	Khan Youins Area	15943	1182771	3170	1300	93527	98.35%	98.34%
	Middle Area	18823	1296281	3927	1883	115278	97.85%	
	Rafah area	9648	820283	1748	679	51825	98.83%	
September	Khan Youins Area	17625	1174522	3013	1298	88900	98.36%	97.69%
	Middle Area	20442	1350820	4025	1905	117907	97.64%	
	Rafah area	10929	915266	1714	643	49894	97.06%	
October	Khan Youins Area	16936	1210864	2883	1309	85908	99.32%	98.40%
	Middle Area	25086	1584491	3797	2032	111503	97.88%	
	Rafah area	9698	838057	1750	644	51467	98.01%	
November	Khan Youins Area	15456	1108779	2857	1280	85216	99.42%	98.11%
	Middle Area	18905	1215953	3661	1893	108206	98.52%	
	Rafah area	9357	783058	1534	524	44349	96.38%	
December	Khan Youins Area	13740	973995	2701	1194	80750	99.67%	98.69%
	Middle Area	16925	1054838	3310	1891	97448	98.15%	
	Rafah area	9091	739780	1579	677	46535	98.26%	
Average water Wells Functionality Efficiency % in Jan-December 2020								98.25%

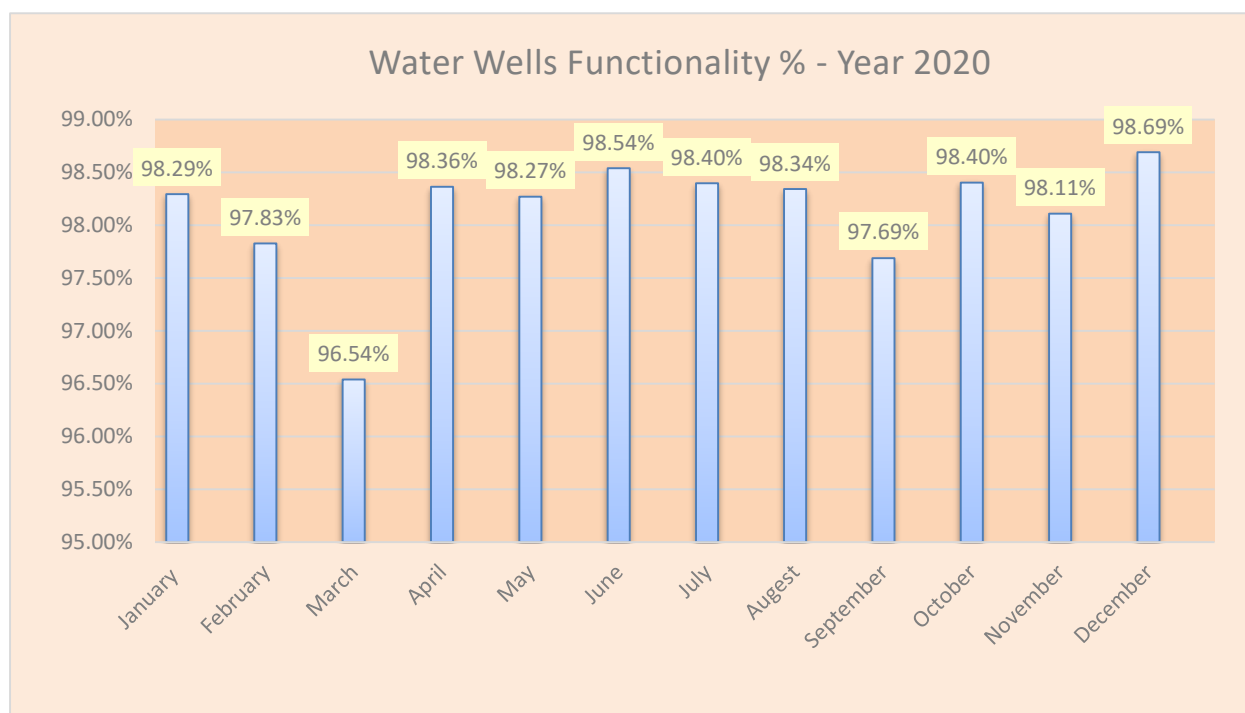


Figure 18 Monthly Functionality Percentage for served Areas-Year 2020

A.4 Improve Energy Consumption

The objective of this indicator is to manage the energy consumption in the water wells, by continued measuring the Specific Energy Consumption for all water wells in the three targeted regional areas and calculated as follows:

$$\text{Specific Energy Consumption (KWh/m}^3\text{)} = \frac{\text{Consumed Energy in KWH}}{\text{water produced in m}^3}$$

During the year 2020, the prevailing conditions of electricity cut off occurred and scheduled on daily basis has become part of the operating inputs and conditions for the systems in the Gaza Strip, and the annual targeted value of specific power consumption of water production wells within the targeted areas have been progressively improved to reach **0.452 KWh/m³** of water produced from wells where the base line value was **0.55 KWh/m³** mid of 2014.

CMWU have continued to manage the efficiency of the pumping equipment utilized in the water wells, many water wells pumps turbines throughout several services areas have been replaced and changed by new more efficient turbines. This intervention improves the pumping efficiency and reduces the

specific power consumption for each cubic meter of water produced under the same hydraulic conditions. The management program set for monitoring of energy consumed by water production wells shows that during the year 2020 of report period, the overall specific Energy consumption in the three targeted regional Areas is **0.452 KWh/m³**.

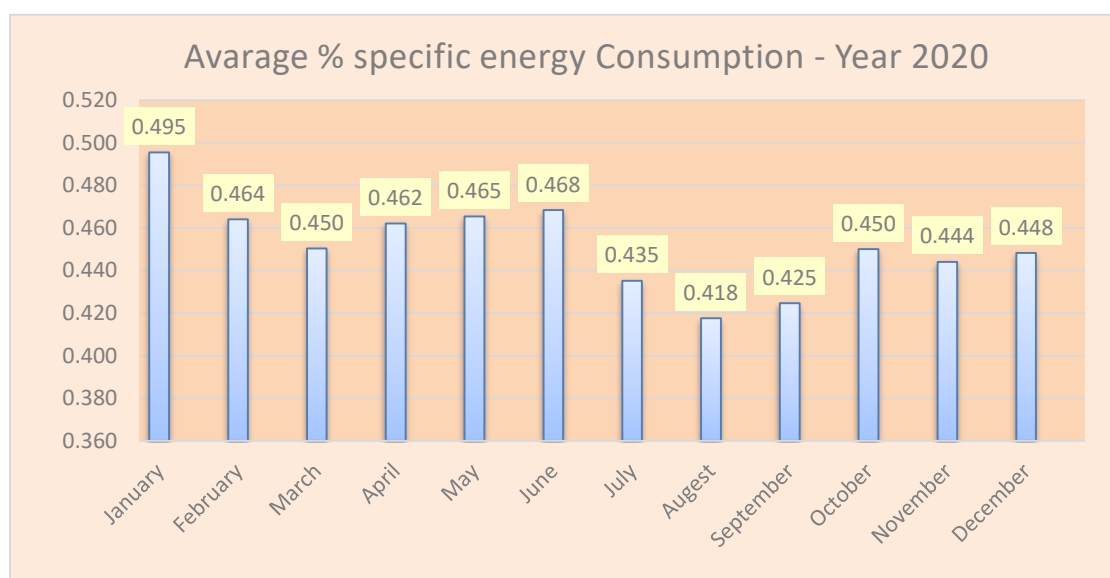


Figure 19 Monthly Specific Energy Consumption 2020

Table 14 The monthly water wells specific power consumption -Middle and South Governorates -YEAR 2020

Average % specific energy Consumption - Year 2020					
Month	Area	Production	Energy	% Specific	Average % per month
		m3	KW	KWh/m3	KWh/m3
January	Khan Younis	849759	610422	0.718	0.495
	Middle	822744	337934	0.411	
	Rafah	713041	254739	0.357	
February	Khan Younis	842824	549274	0.652	0.464
	Middle	913136	310616	0.340	
	Rafah	683385	273584	0.400	
March	Khan Younis	945428	599317	0.634	0.450
	Middle	1123182	382361	0.340	
	Rafah	757904	285636	0.377	
April	Khan Younis	1054627	717003	0.680	0.462
	Middle	1314074	437282	0.333	
	Rafah	793841	296730	0.374	
May	Khan Younis	1240380	793718	0.640	0.465
	Middle	1226891	456519	0.372	
	Rafah	826503	317600	0.384	
June	Khan Younis	1201391	794800	0.662	0.468
	Middle	1340348	473392	0.353	

	Rafah	862838	336982	0.391	
July	Khan Younis	1218819	770686	0.632	0.435
	Middle	1448263	444576	0.307	
	Rafah	860997	315447	0.366	
August	Khan Younis	1182771	730598	0.618	0.418
	Middle	1296511	365290	0.282	
	Rafah	828993	292921	0.353	
September	Khan Younis	1174522	725796	0.618	0.425
	Middle	1350590	399969	0.296	
	Rafah	927815	334112	0.360	
October	Khan Younis	1210864	758756	0.627	0.450
	Middle	1264888	443408	0.351	
	Rafah	853984	318601	0.373	
November	Khan Younis	1108779	692593	0.625	0.444
	Middle	1228457	385291	0.314	
	Rafah	803960	316746	0.394	
December	Khan Younis	973995	632424	0.649	0.448
	Middle	1116758	348917	0.312	
	Rafah	758952	290685	0.383	
Yearly Average % specific energy in January-December 2020					0.452

B. Improve Water Quality

B.1 Disinfection Efficiency

Despite of all prevailing operational conditions, the water disinfection task was of high priority and the maximum recorded disinfection efficiency for the period from January to December 2020 approaches around **97.38%** by the end of December 2020. Over the report period, the disinfection efficiency has progressively increased successfully maintaining a high level of Chlorination throughout the water distribution networks in all Gaza strip governorates. As indicated through the chlorine monitoring program, CMWU is confident that most of the water supply and distribution networks can be disinfected to maximum coverage using the chlorination systems installed, operated and maintained at various water production and pumping facilities.

Monthly disinfection efficiencies recorded as part of the Residual Chlorine Monitoring Program are illustrated in the graph below:

B.2 Residual Chlorine Monitoring Program

The monitoring program continues to be performed in all the municipalities and regional areas on a regular basis using the Photometer test kit, which was made available to the health department of each municipality. Consumables required to run the program were provided as planned in the standard disinfection procedure.

Tests are being carried out for free and total chlorine on a fixed number of sampling points of 594 locations (sampling points) carefully selected to give a true representation of the whole distribution network.

It is clearly shown that by the end of December 2020 there is a significant achievement in which the disinfection efficiency target of the network has been progressively approached and reached the targeted value.

The test results show a maintained residual chlorine level that is consistent within each municipality. During the year 2020, CMWU have continued to monitor the reports of high chlorine levels through the customer complaints whereas the strength of the chlorine solution has been reduced by dilution before it is injected into the network or in some cases dosing pumps have been replaced to match the dosing requirements.

The results of the monitoring program are tabulated and illustrated here below table 15:

Table 15 Water Disinfection Monitoring Program -Year 2020

Monthly Water Disinfection Monitoring Program														
No.	Municipality	Total No. of Samples	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			Number of negative samples	Number of negative samples	Number of negative samples	Number of negative samples	Number of negative samples	Number of negative samples	Number of negative samples	Number of negative samples	Number of negative samples	Number of negative samples	Number of negative samples	Number of negative samples
1	Um Al Nasser	9	2	2	0	0	0	0	0	0	0	2	2	0
2	Beit Hanoun	19	0	2	1	0	0	2	3	0	1	0	0	0
3	Beitlahia	24	1	2	3	2	4	3	2	2	3	0	0	1
4	Jabalia	48	0	0	0	0	0	0	0	0	0	0	0	0
5	Gaza	87	5	6	4	7	5	4	6	7	5	4	6	5
6	Wady Gaza	8	0	0	0	0	0	0	0	0	0	0	0	0
7	Al Moghraka	12	0	0	0	0	0	0	0	0	0	0	0	0
8	Al Zahra	12	0	0	0	3	0	0	0	0	0	0	0	2
9	Al Nusseirate	24	0	0	0	0	0	0	0	0	0	0	0	0
10	Al Burij	22	0	1	1	0	0	2	0	0	0	1	1	2
11	Al Maghazy	24	0	0	0	0	0	0	0	0	0	0	0	0
12	Al Zawaida	25	0	0	0	0	0	0	0	0	0	0	0	0
13	Al Mussader	13	0	0	1	0	0	1	1	0	0	1	0	0
14	Deir Al Balah	36	0	0	0	0	0	0	0	0	0	0	0	0
15	Wady Al Salqa	12	0	0	0	0	0	0	0	0	0	0	0	0
16	Al Qrara	16	2	1	1	2	2	0	0	2	1	1	0	0
17	Khanyounis	44	2	0	1	2	0	0	1	0	0	3	0	2
18	Bani Suhila	28	0	0	0	0	0	0	0	0	0	0	0	0
19	Abssan Al Kabera	21	0	0	0	0	0	1	6	0	4	0	0	0
20	Abssan Al jadeda	16	2	0	1	2	1	0	0	0	3	2	1	1
21	Khezaa	16	0	0	0	0	0	0	0	0	0	0	0	0
22	Al Fokhary	12	0	0	0	0	0	0	0	0	0	0	0	0
23	Al Nasser	12	0	0	0	0	0	0	0	0	0	0	0	0
24	Al Shuka	8	0	0	0	0	0	0	0	0	0	0	0	0
25	Rafah	46	1	1	1	1	1	2	2	1	1	1	1	1
Total		594	15	15	14	19	13	15	21	12	18	15	11	14
Monthly Disinfection Efficiency			97%	97%	97%	97%	98%	97%	96%	98%	97%	97%	98%	98%

Monthly water disinfection efficiency records												
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg. 2020
97.41%	97.41%	97.58%	96.72%	97.75%	97.41%	96.37%	97.93%	96.89%	97.41%	98.10%	97.58%	97.38%

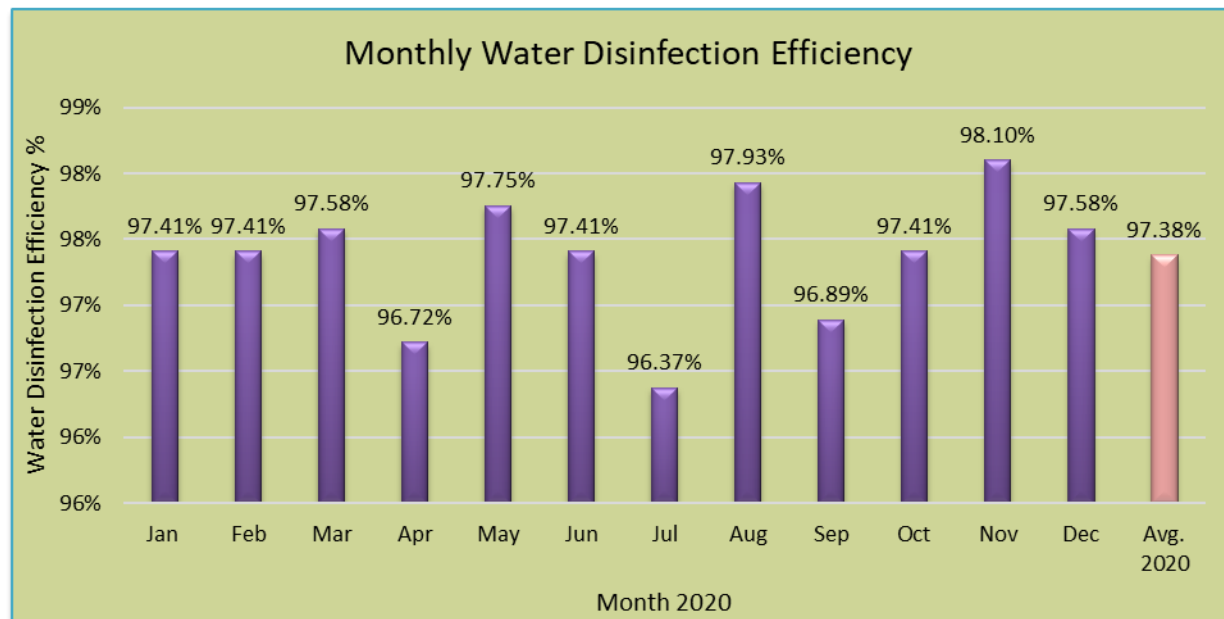


Figure 20 Monthly Water Disinfection Percentage 2020

B.3 Chlorine Dosing Units:

CMWU have continued to manage the repair and replacement of faulty dosing units and all associated systems. The records show **that 13 new chlorine dosing units were installed** to replace defective units and **100** repair jobs have been applied for malfunctioning systems at various water wells and pumping facilities.

Since the chlorine dosing pumps are the critical units in each dosing system, CMWU and its crew in charge have continued to take great care to maintain the essential stock of spares and consumables at the stores. The delivery and repair procedures have continued to be carried out through the regional offices and the Municipal chlorination technicians.

During the year 2020 CMWU has continued to provide support through a new On-Call Service Procedure allowing Municipal chlorination technicians to contact CMWU at any time to log faulty systems, CMWU then ensures the repair is carried out within 48 hours. This procedure has improved the availability of operational dosing pumps, ensuring all water entering the distribution network is securely well disinfected.

B.4 Chlorine Supply and Chemicals Delivery for Desalination Plants:

Since the start of year 2020, a total quantity of 1000 m³ of Sodium Hypochlorite solution NaOCl (10%-12% active chlorine) has been managed, supplied and distributed to the water production and treatment installations throughout all Gaza Strip governorates. The scope of chlorine delivery and supply contract managed by CMWU has included in addition to Chlorine, other water treatment chemicals necessary for the operation of both 100 small and medium scale RO brackish and three Short Term Low Volume (STLV) sea water desalination plants in the Gaza strip. This includes Hydrochloric Acid, citric acid, Sodium Met-bisulfite, Caustic Soda and Anti-scalant and ferric chloride. The provision of these chemicals is essential to the operation of reverse osmosis desalination plants, and contributes significantly to the improvement of water quality at various served areas of Gaza strip.



Figure 21 Chlorine solution supply to water facilities

C. New Water Resource

As the underground coastal aquifer is the main source for water supply to the population of more than 2.2 million living in the Gaza Strip, and Based on various relevant studies, the groundwater deterioration has continued in both quality and quantity in the Gaza Strip due to over abstraction of the aquifer compared to the recharge quantities which led to seawater intrusion and lowering the groundwater table. It has become crucially important to safeguard available fresh water supplies and provide new additional potable water supplies to protect the lives and public health of the people in Gaza. The provision of a Short-Term Low Volume (STLV) seawater desalination plant is one of the mitigation measures integrated in the Comparative Study of options for additional supply of water for the Gaza Strip, currently three STLV desalination plants are existing and the work is ongoing to expand the southern one to reach 20,000m³/day, moreover throughout 2020 PWA through KDF and WB funds has already started the implementation of the associated works of Gaza central seawater desalination plant (GCDP) , in parallel the efforts are exerted to secure the funds for construction the GCDP which is designed to produce 55 million m³ by year 2025 and 110 million m³ by year 2035

C.1 Sea Water Desalination Plants

CMWU in cooperation with PWA throughout different donations has constructed the three short term low volume desalination plants which are:

1- Deir al Balah Sea Water Desalination Plant –Middle area

The desalination plant has been constructed through three phases, the first phase starting with 600m³/day capacity, then IsDB has financed the second phase with 2000 m³/Day capacity and lastly USAID has financed the third phase with 3400m³/day. all phases are, linked and connected to produce in total 6000 m³/day to serve 30,000 inhabitants of the Middle area residents (Deir Al Balah & Al Zawaida cities) through 4000 m³ capacity water blending tank (Al Aqsa).

2- Expansion of the Southern Sea Water Ro Desalination Plant

Southern governorate sea water RO desalination plant is operational now with 6000m³/day capacity, it supplies a good quality water to around 75,000 inhabitants at Rafah and Khan Younis cities.



Figure 22 Sea Water Desalination Plant – Southern Governorates

In cooperation with CMWU and PWA, UNICEF through EU fund is implementing SGDP expansion project to increase the production capacity of the plant to reach 20,000 m³/day, the project also includes connecting the plant with the dedicated power line, this line will be linked with the newly constructed PV system 0.5 megawatt , hence the availability of power supply will assure operating the plant enough hours to meet the needed demand for more than 250,000 inhabitants in Rafah and Khan Younis cities.



Figure 23 Expansion of Sea Water Desalination Plant – Southern Governorates

3- Construction of 10,000 m³/day Sea Water Ro Desalination Plant in Gaza City:

Gaza seawater desalination plant is one component of the STLV program that will improve the potable water supply system for more than 250,000 inhabitants in the Western part of Gaza City. , the construction of the plant includes the following packages and all are completed

- 1st package: Blending tank with 5000 m³ capacity and booster pumping station
- 2nd Package: Transmission line 500 mm diameter, of 6 Km length from the desalination plant to the blending tank,
- 3rd package: Design-build sea water desalination plant, all the plant's activities have been accomplished and the plant is operational since August 2019.
- 4th package: Construction of main electrical power supply line for Gaza SWDP, the The project is completed and the plant is operational now by electricity network.
- During 2020 the service building of RO plant has been furnished and the plant also was provided with monitoring (surveillance) system, whereas there are two tenders are still ongoing to equip the RO with all needed tools and spare parts.



Figure 24 Gaza STL Desalination plant

C.2 Brackish Desalination Plants:

Besides that, CMWU have continued to manage, upgrade, rehabilitate and monitor the 100 existing brackish desalination plants with variant capacities, which were installed from different donations in several areas whereas the groundwater quality is not acceptable for distribution aiming at providing adequate water service for specified areas that are used to be deprived of water supply system. The small capacity plants supply the surrounding population by fountains outside the plant; while the other plants with 600 m³/day or more are used to feed the network in certain areas.

- CMWU in cooperation with AAH and Oxfam has assessed all RO small units through Gaza Strip in order to maintain and rehabilitate those units through different projects to improve their operation efficiency. CMWU and AAH have intervened and finished the maintenance and rehabilitation of 14 Ro units at the southern governorates, besides providing 20 Ro units with PV solar system.
- During 2020 AAH has supported rehabilitation of additional 12 RO units of which 10 will be provided with PV solar energy, the tender documents have been prepared to be launched early 2021.



Figure25: rehabilitation of RO plants

- In cooperation with NRC through GIZ fund, two Ro units in Bani Suhail and Rafah will be rehabilitated, the project also includes supplying 20 water quality kits (testing tools), the tenders have been prepared to be launched early 2021.
- In cooperation with Oxfam and through EU fund, the CMWU has finished rehabilitation of 16 RO plants besides supplying the needed spare parts for maintenance jobs.



Figure 26 Rehabilitation of brackish RO plants and supply spare parts for RO plants

- Besides that, under the same agreement with Oxfam 6 of the targeted RO plants have been equipped with PV solar energy, the project is still ongoing.



Figure 27 providing 6 RO plants with PV solar energy

- Through KDF fund, Al Forqan brackish RO plant at Al Nusirat will be provided with 80 KW -PV solar system, the PV system will be developed to operate separately the RO Desalination plant or the existing water well.
- Through NRC fund two RO desalination plants at Rafah and Bani Suhila are equipped with PV solar system, the project is still ongoing

C.3 Water Networks

This section handles water network plans, upgrading, reconfiguration, resizing. CMWU has succeeded during the year 2020 to implement water networks projects varies between upgrading, reconfiguration, and construction new carrier lines and distribution systems at different areas in the Gaza Strip as follows:

1. The CMWU through ICRC fund has intervened to connect the quarantine centers in Rafah and Dair Al Balah with water networks
2. Rehabilitation of water networks at Al Salam area-Rafah, the project will be launched early 2021, it is financed by PHG .
3. throughout 2020, PWA in cooperation with CMWU has started the implementation of GCDP' associated works, the launched packages include Mecerot connections and construction of 4 water tanks at the middle area and at the east of Khan Younis governorate,
4. The CMWU maintenance crews continued to fix and repair the emergency water networks damages in different areas in Gaza Strip



Figure 28: Maintenance jobs for water & WW networks

C.4 Water Tanks

This section lists the main activities achieved during the period of this report for the new water tanks and water booster pumping stations:

- Construction of two water tanks at Al Amal and Al Satar areas each of 5000m³ capacity, the project is financed by EU through MOF, all the works have been completed and both tanks are operational, the final handing over session conducted on June 2020.



Figure 29 Al Amal and Al Sattar Water Tanks- Khan Younis

- Upgrading of Tal El Sultan pumping station and Providing Canada booster station with PV solar system, the project is funded by ICRC and the work is completed.
- The work is still ongoing in the Construction of Al Zawaida, Al maghazi and Al Buraj water tanks and their carrier lines, the project is included in the associated works packages, it is financed by KDF through PWA
- Complete the construction of Abasan Al Jadida water tank, the project is included in the associated works packages, it is financed by KDF through PWA

C.5 Gaza Sustainable Water Supply Program (Associated Works for Gaza Desalination Project)

The consultancy service aimed to prepare the design and tender documents of the associated works for Gaza desalination project. The project is financed by the world Bank and administrated by the PWA.

The CMWU is part of the technical team in addition to PWA who supervised the consultant during the whole assignment implementation.

The consultant (Lotti) has prepared and submitted to PWA and CMWU the following documents and reports as per the TOR:

- Hydraulic Analysis Report
- Asset Inventory Report and Associated Maps for the existing water distribution system
- Non-Revenue-Water Reports and Maps including NRW strategy and NRW management plan.
- Develop an Investment Plan
- Energy Supply and Energy Management Plan Report
- System Operating Cost Report

- Public Awareness Improvement Report
- Note on SCADA Communication System
- Preliminary ESIA Report

Tender Documents and Complete Tendering Process Report including the following packages:

- ✓ 1st. Package: Southern Carrier including the main pumping stations, Carrier pipes and reservoirs.
- ✓ 2nd. package: North Carrier including the main pumping stations, Carrier pipes and reservoirs
- ✓ 3rd. package: Reconfiguration of Water Distribution System – Southern Gaza Governorates.
- ✓ 4th. package: Reconfiguration of Water Distribution System – Northern Gaza Governorates.
- ✓ Mekorot water Improvement Works – Middle and Khan Younis Governorates Contract Package

The last tender (Mekorot improvement works) was launched during 2020 and still ongoing, it is financed by the KDF. Meanwhile PWA has assigned a consultant to review and update the tender documents of the reconfiguration works. The work is ongoing in close cooperation with CMWU and municipalities' teams to update the tender documents of reconfiguration packages which is financed by WB

D. Waste Water Treatment Plants:

Wastewater Treatment Plants

There are five operational waste water treatment plants in the Gaza strip, three of them are central plants (Khan Younis WWTP, Al Buraj WWTP and North Gaza WWTP) , whereas the other two plants are considered intermediate plants located in Rafah and Gaza city.

CMWU has continued its operational and management roles to manage and carry out comprehensive monitoring program related to the wastewater treatment plants located throughout Gaza strip Governorates and provide for all mitigation measures and improvement programs.

Due to the insecure and intermittent supply of the electricity from GEDCO Grid, it is operationally unrealistic to have sustainable and stable treatment process, however the improvement of the supply for some time during the year had a little effect in the treatment process. Hence to overcome the electricity shortage the three newly constructed WWTPs will be provided with PV solar energy, as the Power is needed all the time for continuous oxygen supply of the aerobic bacteria.

During 2020 there was a slight improvement in wastewater treatment efficiency despite of operating the new WWTP in Khan Younis, the efficiency has reached **84 %** in average, it is affected by the low treatment efficiency of Al Sheikh Ejleen WWTP which operated partially for

more than three months due to the rehabilitation and maintenance works ;whereas, the treatment efficiency will be dramatically improved during 2021 as the newly constructed WWTPs in Khan Younis and Gaza will be operational with high treatment efficiency.

Treatment efficiency and the collected quantities of sewage are shown in **Annex 2**

This section describes the main activities implemented in the treatment plants to improve their treatment efficiencies:

North Gaza Wastewater Treatment Facilities:

North Gaza wastewater treatment plant (NGWWTP) of 35600 m³/day treatment capacity is still under emergency /safe mode operation with minimum staff requirements. CMWU has continued to provide technical operation and maintenance support and assistance for the terminal sewage pumping station and lagoons facilities in Beit Lahia, from which the sewage pumped to new NGWWTP. The main activity in this year in the north area was the implementation of ICRC-financed maintenance and refurbishment contract provided to upgrade the Terminal Pumping Station (TPS) including the following items:

- Construction of overflow concrete box culvert from the inlet manhole to pond no.02 to prevent wastewater floods in the inlet area
- Replacement the chains of mechanical bar screen.
- Cleaning the wet pit room/pumping room
- Repairing the existing warning system





Figure 30 BLWWTP terminal pumping station Spare parts and maintenance activities

Gaza Wastewater Treatment Facilities –Sheikh Ejleen

All previous refurbishment and upgrading works and installations; the existing Sheikh Ejleen wastewater treatment plant (WWTP) brought back into operation mode; the results of treated effluent meet the pre-set design figures achieving about 60 ppm BOD. Also, the efforts continued during 2020 and many maintenance interventions have been completed and others are still ongoing in order to keep the plant in efficient operation.

The progress of the construction works and associated installations of the Central Treatment Plant (Al Buriej WWTP) funded by KFW is satisfactory with total daily capacity of 60,000m³/day . In January 2021; 30,000 m³/day of Gaza wastewater will be diverted to the BWWTP in order to improve the treatment. The sea contamination by the wastewater is stopped due to the operation of Sheikh Ejleen WWTP.

3.5 MW of solar energy project was constructed in the central wastewater treatment plant (BWWTP) and start operation feeding the plant with the required power in addition to 1.2 MW module completed at Al Sheikh Ejleen WWTP and put into operation.

Wadi Gaza Wastewater Treatment Facilities

Wadi Gaza temporary WWTP was closed, and all the sewage collected from the middle area will be diverted to the central pumping station (CPS), then it will be pumped to BWWTP which is currently under commissioning and operation mode , BWWTP is expected to work with its full capacity 60,000m³/day in the second quarter of 2021.

All the wastewater of the middle area will be treated in BWWTP, and this would eliminate the catastrophe of wadi Gaza.



Figure 31 Drying Wadi Gaza WW lagoons

Khan Younis Wastewater treatment plant

The records of the last quarter of 2020 showed that 15000 m³/day are being pumped to the newly operated KHWWT ; the wastewater flow is only collected from Khanyounis city, whereas there is no flow pumped from the eastern villages since no sewage system is existing there, in this regard PWA and CMWU are looking for funding in order to connect the villages with sewage system and to operate KH WWTP with its full capacity, in addition, the CMWU is still working on refurbishment and upgrading ,of the existing pumping systems to cope with the hydraulic characteristics and to convey all the generated sewage from Khan Younis city (around 18,000m³/day) to KHWWT. Until completion these upgrading works the remaining wastewater quantity “around 3000-4000m³/day” will be pumped to the temporary WWTP system located west of the city.

Rafah Wastewater treatment plant

The existing wastewater treatment plant in Rafah with 14,000m³/day average capacity is relatively stable as a subsequent of energy provision stability, but the treatment technology itself having bio towers treatment process has limited removal efficiency and it needs upgrading and modernization to achieve a good quality effluent matching with reuse requirements.

Two phases of solar energy provision were executed to feed 320 KW to the plant, which help improve the functioning of the plant,

Through Japanese fund, different rehabilitation and maintenance interventions have been implemented in Rafah WWTP for the existing Grit removal and sand removing system with mechanical bar screen equipment and cleaning anaerobic inlet lagoons, which relatively improved the treatment efficiency.



Figure 32 Cleaning of anaerobic wastewater lagoons –Rafah wastewater treatment plant

In Parallel with the operation follow up schemes and monitoring the treatment efficiencies of the mentioned plants; CMWU is following up the commissioning and operation of the two central treatment plants Eastern Al Buraij (KFW) and Eastern Khanyounis (IsDB and UNDP& JIKA)

The following are the main implemented activities in the three Central Treatment Plants:

D.1 Gaza Central WWTP Project

KFW has allocated 86.5 million Euros for the construction of Gaza Central Wastewater treatment plant. After completion of the Emergency sewage works in Gaza City and upgrading wastewater treatment plant Sheikh Ejleen; KFW has approved addendum 4.

The addendum agreed to re-plan and update the central WWTP project to take into account changes that have occurred since the original project documents were prepared; the project includes the following:

- Buriej Central Wastewater Treatment Plant and Wadi Gaza Central PS
- Pressure Pipelines from Wadi Gaza PS to Buriej WWTP
- Gravity Collector from Shiekh Ajleen WWTP (Gaza City) to Wadi Gaza PS, including connections to the Central Communities wastewater system.
- Solar Energy source.
- Sheikh Ejleen Measures
- Wadi Gaza Measures

Contract 1: Bureij Central Wastewater Treatment Plant and Central Pump station at Wadi Gaza



Figure 33 Central WWTP and Central PS Wadi Gaza

The contractor has completed all the civil works and electro-mechanical works in the plant as detailed in the following table:

Activity	Percentage completed %
Final Clarifiers	100
Bioreactor	100
Blower Station	100
Primary Clarifier	100
Supernatant Pumping Station	100
4 No. Sludge Thickener Tanks	100
Thickened Sludge Pumping Station	100
Scum Pumping Station	100
1 No. Thickened Sludge Tank	100
Digester Tanks	100
Digester Building	100
Administration Building	100
Gas Holder	100
Workshop Building	100
Sludge Dewatering Building	100
Water Tank	100
Grit and Grease Chamber	100
Return and Excess Sludge Pumping Station	100
Service Water Pumping Station	100
Flow Meter Chamber	100
Primary Clarifier Distribution Chamber	100
Bioreactor Distribution Chamber	100
Scum Pumping Station to Final Clarifiers	100
Grease Holding Tank	100
Electrical Room	100
Variation Order No. 1 – Retaining and Boundary Walls	100
Wadi Gaza Central Pumping Station Activates	100

Some components of the treatment plant such as CHP, Boiler and the desulphurization unit still not commissioned because of the restriction on the movement of international staff because of COVID 19 pandemic.

It is agreed to start the plant with a maximum flow of 30,000m³/day by a local staff and support from international experts. A taking over certificate was issued to the contractor on August 2020 and a start-up for the plant began on 8th of December 2020.



Contract 2: Pressure Pipeline

The project consists of installing the ductile iron pressure pipeline of total length 4600 m (1200 m of diameter 400mm and the 3400m of diameter 1200mm) ,and procure and install 22kV cables and fibre-optic cables between the Wadi Gaza CPS and Buriej WWTP, Contract C2 has now been completed

- Taken over of the works on the 20th August 2019
- Commencement of the Defects Notification Period on the 21st August 2019.
- Completion of the Defects Notification Period on the 20th August 2020.
- Contractor extended his Defects Notification Period to the 25th February 2021.



Figure 34 Central WWTP Pressure line

Contract 3: Gravity Pipeline:

The project includes installing gravity pipelines, and fibre-optic cables between the Interception Chamber at Sheikh Ajleen WWTP and Wadi Gaza Central PS, and connecting the Central Communities Collector to Wadi Gaza CPS as detailed below:

- Construction of Gaza Gravity Collector (DN 1500), 5,700 m long from Sheikh Ajleen WWTP to Wadi Gaza CPS including all ancillary facilities;
- Construction of Central Communities Gravity Collector (DN 1000), 220 m long from Salah Deen Road to Wadi Gaza CPS including all ancillary facilities;
- Manholes;
- Construction of diversion chamber at EWWTP, including dealing with existing flows
- Connection to the inlet manhole at the Wadi Gaza CPS;
- Fibre Optic Cable (SCADA) between the Diversion Chamber at Sheikh Ajleen to Wadi Gaza CPS (5,700 m).
- Reinstatement works.

Substantial Completions and Taking Over of the Permanent Works:

- The Taking Over Certificate together with the Snagging List was issued to the Contractor on Tuesday, 28th April 2020.
- The Contractor completed all works required under the snagging List and notified the Engineer accordingly.
- Final Components of the Contract:
 - 1500mm Concrete Pipes – 5,353m laid to date = 100% Complete.
 - 1500mm Concrete Manholes – 65 No = 100% Complete.
 - 1000mm Concrete Pipes – 215m laid to date = 100% Complete.
 - 1000mm Concrete Manholes – 3 No Constructed = 100% Complete.
 - Fibre Optic Cable – 5,754m laid to date = 100% Completed & Tested.

Interception Chamber including all connections, valves and Fittings – 100% Completed.



Figure 35 Central WWTP Gravity Pipeline

Contract 4: PV – Solar Energy Source

The project includes the complete solar PV system to be installed within the boundary of the Buriej WWTP as detailed below:

- Design, procure, manufacture, ship and deliver to store all equipment and special materials to be imported for the project.
- Provide erection, installation and site testing details for all other items.
- Include civil and building construction, testing and commissioning

The contract awarded early 2019 and all installation works have been completed, GEDCO Power supply has been connected, the PV put into permanent operation.



Figure 36 Solar Panels installation

Sheikh Ajleen Summary of Works Completed:

All works associated with the PV Plant at Sheikh Ajleen has been installed, operated, tested and commissioned successfully.

The Engineer issued the Taking Over Certificate together with the agreed Snagging List on the 10th October 2020 with the Taking Over of the Works from the 26th August 2020 at the time of the Contractor's notification.

Buriej WWTP Taking Over Inspection:

The Engineer issued the Taking Over Certificate together with the agreed Snagging List on the 13th October 2020 with the Taking Over of the Works from the 26th August 2020 at the time of the Contractor's notification

Contract 6: Sheikh Ejleen Measures

The contract includes rehabilitation of GWWTP and repair electromechanical equipment to allow the plant continue operation through the first phase of the central wastewater treatment plant at east Buriej. The works include cleaning of ponds, rehabilitation of electrical panels, rehabilitation and

replacement of mechanical equipment; 100 % of the activities of the project have been completed during 2019.



Figure 37 Parts of Shiekh Ejleen Measures

Wadi Gaza Measurers:

The project started August 2019 and consist of the following activities:

- Grading of and stabilizing/ securing the existing river channel to suit the defined design flows.
- Construction of 16 no. box type culverts for light traffic and pedestrians, replacing the existing culverts.
- Construction of 7 no. river bed sills/ weirs with stilling basins, partly in combination with new culverts.
- Removal of illegal waste dumps and various obstructions from Wadi Gaza valley.
- Installation of underground power cable lines between WWTP EL Buriej and several sewage pump stations, aligned along Wadi Gaza valley.



Figure 38 Part of Wadi Gaza measures

- During October 2020 the Contractor substantially completed the works in Wadi Gaza, there remains some required partial additional works, some of which the Contractor has previously completed, to cover this amount of additional works, Dorsch has raised a Variation Order which

has been sent to CMWU and then forwarded to KfW for their “No objection” in order to close out this contract, additional works completed.

D.2 Khan Younis Wastewater Treatment Plant (KHWWTTP)

The permanent KHWWTTP is Implemented through two phases with capacity 26,656 m³/day for phase I and 44,948 m³/day for phase II; the project is financed by ISDB (KDF), JICA and implemented by (UNDP and CMWU in cooperation with PWA), the tenders of the first phase has been launched by end of 2016 whereas the implementation started on ground early 2017, the project components were included in three separate tenders as follow:

1- Construction of Khan Younis Waste Water Treatment Plant and Buildings

The following process and technology is used for KY WWTP in order to achieve waste water treatment objectives,

- Pre-treatment including screening and de-greasing/de-gritting.
- Secondary treatment including nitrogen removal.
- Tertiary treatment.

The main activities of this package are:

- Effluent treatment:
- Pre-treatment including fine screening as well as grit and grease removal;
- Aeration tanks and clarification tanks;
- Tertiary treatment including sand filtration and UV disinfection;
- Treated effluent outlet pumping station.
- Sludge treatment.
- Gravity thickening;
- Sludge drying on open drying beds;
- Sludge composting.

All the construction activities here above were completed, the treatment plant is currently operated under CMWU mangment..



Figure 39 Khanyounis Central TP

2- Construction of Main Pressure Lines to the Sea and to the Infiltration Basins

The effluent main pressure pipeline constructed and used to pump the treated effluent from the effluent pumping station located at the KY WWTP site to the infiltration basins at Al Fokhari area and to the sea in emergency cases with a total length of around 18.6 kilometers.

The first 5.6 km of this effluent pipeline completed and used to convey the treated wastewater to Al Fokhari infiltration basins. An emergency pressure pipeline of 13 Km length is also completed it is used to discharge the effluent pipeline to discharge treated effluent into the sea

3- Construction of the Infiltration Basins in AL Fokhari

The construction of the infiltration basins over 100 downm was completed since 2019 and now it is used for infiltration the treated wastewater.



Figure 40 Infiltration Basin at Al Fokhari

- In addition, the CMWU in cooperation with UNDP through ISDB fund is currently upgrading the central pumping station 8 , whereas extending the main carrier line from PS 8 to KHWWTWP was completed during the second quarter of 2020 .

in addition, the construction of the dedicated power supply line to the treatment plant is also completed, moreover the plant will be equipped with PV solar energy, UNDP has launched the consultancy services for design PV system of total capacity 7MW to operate the whole TP and there is allocated fund to implement 1.3 MW PV system as a first stage from Norwegian government and another EU fund of total 2.9 M Euro to implement 2.0 MW as a second stage. Recently IsDB is committed to finance 3.7 MW, hence, the whole system 7 MW is expected to be implemented during 2021-2023 to cover the total energy load of the treatment plant.

D.3 The Permanent Northern Treatment Plant (NGEST)

The new wastewater treatment plant of daily capacity 35600m3/is currently operated by PWA-PMU dedicated staff.

In the construction agreement among PWA and WB (Multi donors fund); it is clearly mentioned that CMWU is the operator. An MOU has been drafted among PWA, CMWU and Northern Municipalities which abide the CMWU to operate the NGEST, signing the mentioned MOU is currently under processing

E. Storm Water Activities

Many storm water collection and pumping facilities constructed and upgraded during the past five years have become operational. This provide remarkable improvement and relief and reduce the risk of flooding at various areas of Gaza strip and positive impacts have been significantly recorded from various hot spots in the field. During 2020, the CMWU has continued implementation of the most needed stormwater interventions either through construction new projects or through dealing with all commitment, in cooperation with all partners and municipalities in order to alleviate the situation in some hotspots areas through the following interventions:

- Disburse materials and spare parts for sewage and storm water pumping stations and associated systems from the main CMWU stores to the Municipalities as preparedness activities before the winter season.
- Provide mechanisms and workers to clean up rain water gullies and manholes along streets and districts of the Gaza Strip as per on going works projects during the rainy days.
- Manage annual maintenance and operational preparedness of mobile self-priming storm water trash pumping sets driven by Diesel engines and distribute it throughout various stations spread all over Gaza strip governorates with all associated pressure and intake hoses requirements and fuel needs.

- Cleaning, upgrading of water flows channels to cope, reduce and eliminate the risks of flooding such as construction of additional storm water gullies and pipes, cleaning infiltration basins and storm water lagoons collection systems and rehabilitation of storm water pumping stations.
- Supply all required safety and protective tools, clothes and equipment for technicians and labours working under the storm and flooding conditions.
- the positive impact of the newly NRC financed storm water project in Al Aqsa street at Dair Al Balah was noticed during the rainy season 2020-2021, as no flooding event occurred.
- Also, NRC has supported and financed the preparedness & winterization activities for 2019-2020 winter season, the activities include but not limited to:
 - Tools and clothes supply,
 - Maintenance and cleaning of storm water basins, gullies and wet pits at the middle and southern governorates.
 - Hiring on call to intervene during emergencies.
 - Construction infiltration basin in Rafah



Figure 41: construction of Al Attatra stormwater pipeline and infiltration basin through NRC preparedness project



Figure 42 Upgrading works in Al Juninah stormwater basin-Rafah through NRC project

- Construction of Aslan stormwater infiltration basin in Beit Lahia; the project is financed by IsDB and implemented by Emmar Palestine in cooperation with the CMWU all the works have been completed in August 2020 and the basin is operational now, it collects the Storm water from 2 Km2 catchment area.



Figure 43: Aslan stormwater infiltration basin-Beit Lahia

- Construction of stormwater pumping station and the carrier line to the sea for Al Saftawi basin the project was completed and financed by OCHA through SC



Figure 44 Al Saftawi carrier line



Figure 45 Storm water preparedness activities

F. Waste Water Activities

F.1 WW Networks

This section summarizes the wastewater networks activities include the extension, repair and maintenance through different donations as follows:

1. completed the upgrading of sewage networks at Rafah area, the project is financed by TRC.
2. PWA through Austrian fund is currently working to launch the RFP for consultancy service to update the master plan and to produce the detailed design for sewage system at the eastern villages of Khan Younis governorate, this project is of top priorities needs, since the central WWTP is operational now and it was designed to serve and receive sewage flow from Eastern villages besides Khan Younis city to work with its full capacity 26,500 m³/day
3. Construction wastewater networks at Al Nussirat camp, the project is ongoing, it's financed by ANERA



Figure 46 WW networks in Al Nussirat

4. Through AAH fund, the CMWU in cooperation with Jabalia municipality has completed the rehabilitation of wastewater networks at Qeba'a and Temmraz areas in Jabalia.



Figure 47 wastewater networks in Jabalia

5. Fixing the damages in wastewater networks at Rafah, the works have been implemented by CMWU maintenance crew



Figure 48 Fixing the damages in wastewater network-Rafah

F.2 Electromechanical Services for Waste Water & Storm Pumping and Treatment Facilities

During the period of this report from January to December 2020, several electromechanical maintenance and repair services and activities summarized here below have been carried out to safeguard the systems and reduce the possibilities of breakdown events and eliminate the risks of environmental contamination by wastewater flooding.

Meanwhile, most of wastewater and storm-water services and pumping facilities were continued to be severely overused and overloaded during the last storm events hit Gaza strip in the last year and create several emergency needs for repairs during flooding times. Therefore, CMWU has taken all possible initiatives to reduce the negative impacts of storm.

Several activities have been summarized here below and carried out to maintain, repair and improve wastewater and storm water systems

- 1 Manage and carry out comprehensive electromechanical maintenance and repair program for sewage pumps of wastewater pumping stations, the work includes rewinding electrical motors, changing the bearing sets (upper & Lower bearings), changing mechanical seals sets (Water & oil mechanical seals sets), changing wear rings, rubber rings, rubber repair kits, changing impellers, rotors, etc., and carry out all work shop requirement i.e. changing bolts, impeller balancing, sand blasting, painting, etc. Maintenance task orders exceeded 45 pumps during year 2020.

- 2 Manage and carry out comprehensive electromechanical maintenance and repair program for pressure manifolds of wastewater pumping stations, the work includes maintenance of gate valves, non-return valves, changing flanged coupling, pipes sand blasting, painting, etc. Maintenance task orders were more than 13 tasks per year of 2020.
- 3 Manage and carry out comprehensive electromechanical maintenance, replacement, repair program for automatic mechanical bar screens of wastewater pumping at 5 sewage pumping stations.
- 4 Manage and carry out comprehensive cleaning process for sewage pumping stations, cleaning process includes pump wet pit, bar screen chamber, inlet chamber, grit removal, pumping station yard. Cleaning process takes two times for each pumping stations, but for central pumping station may be per week, this is for huge sand quantities comes by influent wastewater coming to the sewage pumping stations, as well as this process may be after each storm. Cleaning process task orders were more than 33 sewage pumping station for year 2020.
- 5 Upgrading and refurbishment the existing pumping system of KHWWTTP through IsDB fund, the project is still ongoing, it includes upgrading works in PS.08, Hisbit Al Samak and Al Wafiya pumping stations.
- 6 Launching the tender for construction wastewater networks at Al Fokhari which will discharge the flow to PS.08 which is being upgraded, the project is financed by IsDB,
- 7 Rehabilitation, electromechanical maintenance and operation of the auto mechanical bar screen for more than 5 pumping stations “Al Junina P.S, Jumaizet Sabeel PS , Hawaber PS and Al Sekka PS,..”



Figure 49 Installing mechanical Bar Screen

- 8 Rehabilitation and Upgrading of AL Hawaber sewage pumping station, the works included installation of fourth pump and replacement the existing manifold and pressure line, the project is completed and financed by OCHA through AAH



Figure50: mechanical repairs for Al Hawaber PS



Figure 51: cleaning the pumps room in different sewage pumping stations



Figure 52: Rehabilitation of Tal Al Zaatar PS

- 9 During the period of this report from January to December 2020, more than 35 several mechanical repairs have been carried out for the municipal heavy machines including engines overhauling, fabrication new sewage tanks, suction pumps maintenance, tires replacement, filters & oil replacement, body repairs, gear box, transmission system, drive shafts, disc clutches, engines, pins, buckets, lights, absorption dampers, steering joints, in order to keep these machines in good operation and to help the municipal teams to fix the emergency repairs for water and wastewater facilities and infrastructures, usually such repairs are supported by ICRC to make sure that all equipments and machines are operational and ready for emergency cases. The implemented maintenance works during 2020 are listed in the below table



Figure53: Maintenance works for heavy machineries

Table 16 List of major rehabilitation and repair works/Wastewater and storm water facilities

Annual Sewage Works Report for - 2020			
Item No.	Municipality	Site/Facility	Work Description
1	North Bait Lahia	BLWWTP	Supplying and Backfilling Clean sand material
2	Bait Lahia	Al Siafa P.S	Rewinding 7.4 KW electrical motor
			Supply and install upper bearings for Submersible Flygt Pump-CP 7.4 KW
			Supply and install lower bearings for Submersible Flygt Pump-CP 7.4 KW
			Supply and install set of mechanical seals for Submersible Flygt Pump-CP 7.4 KW
			Checking and inspection for deteriorated pumps/parts at the site (P.S) and in the workshop for Submersible Flygt Pump-CP 7.4 KW
3	Bait Lahia	Al Manshia P.S	Rewinding 54 KW electrical motor
			Supply and install upper bearings for Submersible Flygt Pump-CP 54 KW
			Supply and install lower bearings for Submersible Flygt Pump-CP 54 KW
			Supply and install set of mechanical seals for Submersible Flygt Pump-CP 54 KW
			Checking and inspection for deteriorated pumps/parts at the site (P.S) and in the workshop for Submersible Flygt Pump-CP 54 KW

			Supply and install (As per manufacturer installation manual) Impeller for Submersible Flygt Pump-CP 3300. 181HT, 54 KW.
4	Bait Lahia	Amer P.S	Supply and install upper bearings for Submersible Flygt Pump-CP 125 KW
			Supply and install lower bearings for Submersible Flygt Pump-CP 125 KW
			Supply and install set of mechanical seals for Submersible Flygt Pump-CP 125 KW
			Checking and inspection for deteriorated pumps/parts at the site (P.S) and in the workshop for Submersible Flygt Pump-CP 125 KW
5	Bait Lahia	Aslan 04 P.S	Rewinding 54 KW electrical motor
			Supply and install upper bearings for Submersible Flygt Pump-CP 54 KW
			Supply and install lower bearings for Submersible Flygt Pump-CP 54 KW
			Supply and install set of mechanical seals for Submersible Flygt Pump-CP 54 KW
			Checking and inspection for deteriorated pumps/parts at the site (P.S) and in the workshop for Submersible Flygt Pump-CP 54 KW
6	Bait Lahia	Al Mashroaa' P.S	Supply and install (As per manufacturer installation manual) Impeller for Submersible Flygt Pump-CP 3300. 181HT, 54 KW.
10	North Bait Lahia	BLWWTP	Supply, install and test mechanical coupling for horizontally assembled end suction ABS type wastewater centrifugal pump (1100m ³ /hr at 60 meter head and 315KW electric motor)
			Supply and install in the pump room, 2 - electrical mercury type float switch flygt or equivalent.
			Additional Works; Concrete for BLWWTP to install the Sluice gate
7	Jabalia	Hawaber P.S	Rewinding 78 KW electrical motor for multi-manufacturer pumps, KSB 78 KW.
			Supply and install upper bearings for multi-manufacturer pumps, KSB 78 KW.
			Supply and install lower bearings for multi-manufacturer pumps, KSB 78 KW.
			Supply and install set of mechanical seals for multi-manufacturer pumps, KSB 78 KW.
			Supply and install Impeller case for multi-manufacturer pumps, KSB 78 KW.
			Checking and inspection for deteriorated pumps/parts at the site (P.S) and in the workshop for multi-manufacturer pumps, KSB 78 KW.
8	Jabalia	Mahader P.S	Rewinding 30 KW electrical motor
			Supply and install upper bearings for Submersible Flygt Pump-CP 30 KW
			Supply and install lower bearings for Submersible Flygt Pump-CP 30KW
			Supply and install set of mechanical seals for Submersible Flygt Pump-CP 30KW
			Checking and inspection for deteriorated pumps/parts at the site (P.S) and in the workshop for Submersible Flygt Pump-CP 30 KW
			Supply and install two 2" with minimum 2mm thick stainless steel 316L guide rails along the delivery pipe for each pump
9	Jabalia	Al Maslakh P.S	Rewinding 13.5 KW electrical motor

			Supply and install upper bearings for Submersible Flygt Pump-CP 13.5 KW
			Supply and install lower bearings for Submersible Flygt Pump-CP 13.5 KW
			Supply and install set of mechanical seals for Submersible Flygt Pump-CP 13.5 KW
			Checking and inspection for deteriorated pumps/parts at the site (P.S) and in the workshop for Submersible Flygt Pump-CP 13.5 KW
10	Jabalia	Al Alamy P.S	Rewinding 30 KW electrical motor
			Supply and install upper bearings for Submersible Flygt Pump-CP 30 KW
			Supply and install lower bearings for Submersible Flygt Pump-CP 30KW
			Supply and install set of mechanical seals for Submersible Flygt Pump-CP 30KW
			Checking and inspection for deteriorated pumps/parts at the site (P.S) and in the workshop for Submersible Flygt Pump-CP 30 KW
			Install the base of the sewage multi-manufacturer pump, Siniaver 18KW type
11	Rafah	Al Junina Sewage P.S	Rewinding 54 KW electrical motor
			Supply and install upper bearings for Submersible Flygt Pump-CP 54 KW
			Supply and install lower bearings for Submersible Flygt Pump-CP 54 KW
			Supply and install set of mechanical seals for Submersible Flygt Pump-CP 54 KW
			Checking and inspection for deteriorated pumps/parts at the site (P.S) and in the workshop for Submersible Flygt Pump-CP 54 KW
12	Rafah	Block O P.S	Supply and install upper bearings for Submersible Flygt Pump-CP 5.9 KW
			Supply and install lower bearings for Submersible Flygt Pump-CP 5.9 KW
			Supply and install set of mechanical seals for Submersible Flygt Pump-CP 5.9 KW
13	Bani Suhila	Bani Suhila P.S	Rewinding (13-15) KW electrical motor
			Supply and install upper bearings for Submersible Flygt Pump-CP (13-15) KW
			Supply and install lower bearings for Submersible Flygt Pump-CP (13-15) KW
			Supply and install set of mechanical seals for Submersible Flygt Pump-CP (13-15) KW
			Checking and inspection for deteriorated pumps/parts at the site (P.S) and in the workshop for Submersible Flygt Pump-CP (13-15) KW
			Rewinding 2.4 KW electrical motor
			Supply and install upper bearings for Submersible Flygt Pump-CP 2.4 KW
			Supply and install lower bearings for Submersible Flygt Pump-CP 2.4 KW
			Supply and install set of mechanical seals for Submersible Flygt Pump-CP 2.4 KW
			Checking and inspection for deteriorated pumps/parts at the site (P.S) and in the workshop for Submersible Flygt Pump-CP 2.4 KW
14	Khanyuonis	Al Amal Stormwater	Supply and install impeller for pump, KSB No (KRTK 250-400/954UNG-S), and impeller (230) No.(Grey cast iron EN-GJL-250).

15	Khanuonis	Al Wafia P.S	Supply and install an impeller for KSB210 kw (As per manufacturer specifications manual).
16	Khanuonis	Hesbit Al Samak P.S	Supply and install an impeller for KSB210 kw (As per manufacturer specifications manual).
17	Bait Lahia	Amer P.S	Rewinding (2.1-7.5) KW electrical motor
			Supply and install upper bearings for Submersible Flygt Pump-CP (2.1-7.5) KW
			Supply and install lower bearings for Submersible Flygt Pump-CP (2.1-7.5) KW
			Supply and install set of mechanical seals for Submersible Flygt Pump-CP (2.1-7.5) KW
			Checking and inspection for deteriorated pumps/parts at the site (P.S) and in the workshop for Submersible Flygt Pump-CP (2.1-7.5) KW
18	Jabalia	Abu Rashed P.S	Rewinding (85-125) KW electrical motor
			Supply and install upper bearings for Submersible Flygt Pump-CP (85-125)KW
			Supply and install lower bearings for Submersible Flygt Pump-CP (85-125) KW
			Supply and install set of mechanical seals for Submersible Flygt Pump-CP (85-125) KW
			Supply and install Impeller for S.M sewage pump, Flygt, 125kw, CP 3231, (As per manufacturer installation manual)
			Checking and inspection for deteriorated pumps/parts at the site (P.S) and in the workshop for Submersible Flygt Pump-CP (85-125) KW
			Rewinding 30 KW electrical motor
			Supply and install upper bearings for Submersible Flygt Pump-CP 30 KW
			Supply and install lower bearings for Submersible Flygt Pump-CP 30 KW
			Supply and install set of mechanical seals for Submersible Flygt Pump-CP 30 KW
19	Khanuonis	Al Tanfizia P.S	Checking and inspection for deteriorated pumps/parts at the site (P.S) and in the workshop for Submersible Flygt Pump-CP 30 KW
			Rewinding 4.5 KW electrical motor
			Supply and install upper bearings for Submersible Flygt Pump-CP 4.5 KW
			Supply and install lower bearings for Submersible Flygt Pump-CP 4.5 KW
			Supply and install set of mechanical seals for Submersible Flygt Pump-CP 4.5 KW
20	Al Nussirat	Al Nussirat Main P.S	Checking and inspection for deteriorated pumps/parts at the site (P.S) and in the workshop for Submersible Flygt Pump-CP 4.5 KW
			Rewinding the electrical motors, for Sewage multi-manufacturer pumps, Flygt 85 KW type.
			Supply and install upper bearings for Sewage multi-manufacturer pumps, Flygt 85 KW.
			Supply and install lower bearings for Sewage multi-manufacturer pumps, Flygt 85 KW.
			Supply and install set of mechanical seals for for Sewage multi-manufacturer pumps, Flygt 85 KW.
			Checking and inspection for deteriorated pumps/parts at the site (P.S) and in the workshop, for Sewage multi-manufacturer pumps, Flygt 85 KW type.

21	Deair Al Balah	Al Bassa P.S	Carry out complete maintenance and fixing of the two pump duck foot for Sewage multi-manufacturer pumps, Flygt 54 KW
22	Al Moghraqa	Al Moghraqa P.S	Supply and install upper bearings for two Sewage multi-manufacturer pumps, Flygt 13.5 KW.
			Supply and install lower bearings for Sewage multi-manufacturer pumps, Flygt 13.5 KW.
			Supply and install set of mechanical seals for two Sewage multi-manufacturer pumps, Flygt 13.5 KW.
			Checking and inspection for deteriorated pumps/parts at the site (P.S) and in the workshop, for two Sewage multi-manufacturer pumps, Flygt 13.5 KW type.
23	Al Nussirat	New Camp P.S	Supply and install upper bearings for two Sewage multi-manufacturer pumps, KSB 22 KW.
			Supply and install lower bearings for Sewage multi-manufacturer pumps, KSB 22 KW.
			Supply and install set of mechanical seals for two Sewage multi-manufacturer pumps, KSB 22 KW.
			Supply and Install Impeller for Sewage multi-manufacturer pumps, KSB 22KW
			Checking and inspection for deteriorated pumps/parts at the site (P.S) and in the workshop, for two Sewage multi-manufacturer pumps, KSB 22 type.
24	Deair Al Balah	Al Bassa P.S	Carry out Complete electromechanical Overhauling and repair of 2 ton hoist crane
			Supply and Install Impeller for Sewage multi-manufacturer pumps, Flygt 54 KW
			carry out complete workshop mechanical overhauling and repairs of foure 4" inches air release valve
			Supply and install upper bearings for two Sewage multi-manufacturer pumps, Flygt 54 KW.
			Supply and install lower bearings for two Sewage multi-manufacturer pumps, Flygt 54 KW.
			Supply and install set of mechanical seals for two Sewage multi-manufacturer pumps, Flygt 54 KW.
25	Rafah	RWWTP	Checking and inspection for deteriorated pumps/parts at the site (P.S) and in the workshop.
			Supply and install upper bearings for Sewage multi-manufacturer pumps, ABS 45 KW.
			Supply and install lower bearings for Sewage multi-manufacturer pumps, ABS 45 KW.
			Supply and install set of mechanical seals for for Sewage multi-manufacturer pumps, ABS 45 KW.
26	Deair Al Balah	Al Bassa P.S	Supply and install upper bearings for Sewage multi-manufacturer pumps, Flygt 54 KW.
			Supply and install lower bearings for Sewage multi-manufacturer pumps, Flygt 54 KW.
			Supply and install set of mechanical seals for for Sewage multi-manufacturer pumps, Flygt 54 KW type.
			Checking and inspection for deteriorated pumps/parts at the site (P.S) and in the workshop.
27	Rafah	RWWTP	Rewinding the electrical motors, for sewage multi-manufacturer pump ABS 45KW.
28	Jabaliala	Hawaber P.S	Rewinding the electrical motors of Sewage multi-manufacturer pumps of 78 KW

			Supply and install upper bearings for KSB Submersible Pump, 78 KW
			Supply and install lower bearings for KSB Submersible Pump, 78 KW
			Supply and install set of mechanical seals for KSB Submersible Pump, 78 KW
			Checking and inspection for deteriorated pumps/parts at the site (P.S) and in the workshop for KSB Submersible Pump, 78 KW
29	Jabalia	Taal Al Zatter P.S	Rewinding the electrical motors of Sewage multi-manufacturer pumps of 54 KW
			Supply and install upper bearings for KSB Submersible Pump, 54 KW
			Supply and install lower bearings for KSB Submersible Pump, 54 KW
			Supply and install set of mechanical seals for KSB Submersible Pump, 54 KW
			Checking and inspection for deteriorated pumps/parts at the site (P.S) and in the workshop.
30	Al Nussairat	Al Hassaina P.S	Rewinding the electrical motors of Sewage multi-manufacturer pumps of 54 KW
			Supply and install upper bearings for KSB Submersible Pump, 54 KW
			Supply and install lower bearings for KSB Submersible Pump, 54 KW
			Supply and install set of mechanical seals for KSB Submersible Pump, 54 KW
31	Bait Hanoun	Industrial Sewage P.S	Supply and install upper bearings for KSB Submersible Pump, 78 KW
			Supply and install lower bearings for KSB Submersible Pump, 78 KW
			Supply and install set of mechanical seals for KSB Submersible Pump, 78 KW
			Checking and inspection for deteriorated pumps/parts at the site (P.S) and in the workshop.
32	Rafah	RWWTP	Supply and install upper bearings for ABS Submersible Pump, 45 KW
			Supply and install lower bearings for ABS Submersible Pump, 45 KW
			Checking and inspection for deteriorated pumps/parts at the site (P.S) and in the workshop.
33	Bait Hanoun	Industrial Sewage P.S	Rewinding the electrical motors of Sewage multi-manufacturer pumps of 78 KW
34	Rafah	Al Junina Sewage P.S	Supply and install upper bearings for flygt Submersible Pump, 54 KW
			Supply and install lower bearings for flygt Submersible Pump, 54 KW
			Supply and install set of mechanical seals for flygt Submersible Pump, 54 KW
			Checking and inspection for deteriorated pumps/parts at the site (P.S) and in the workshop.
35	Bani Suhila	Bani Suhila Sewage P.S	Rewinding the electrical motors of Sewage multi-manufacturer pumps of 15 KW
			Supply and install upper bearings for flygt Submersible Pump, 15 KW
			Supply and install lower bearings for flygt Submersible Pump, 15 KW
			Supply and install set of mechanical seals for flygt Submersible Pump, 15 KW
			Checking and inspection for deteriorated pumps/parts at the site (P.S) and in the workshop.

36	Bani Suhila	Abu Sroor Sewage P.S	Rewinding the electrical motors of Sewage multi-manufacturer pumps of 2.4 KW
			Supply and install upper bearings for flygt Submersible Pump, 2.4 KW
			Supply and install lower bearings for flygt Submersible Pump, 2.4 KW
			Supply and install set of mechanical seals for flygt Submersible Pump, 2.4 KW
			Checking and inspection for deteriorated pumps/parts at the site (P.S) and in the workshop.
37	Khanuonis	Al Majadlah P.S	Rewinding the electrical motors of Sewage multi-manufacturer pumps of 7.5 KW
			Supply and install lower bearings for flygt Submersible Pump, 7.5 KW
			Supply and install lower bearings for flygt Submersible Pump, 7.5 KW
			Supply and install set of mechanical seals for flygt Submersible Pump, 7.5 KW
			Checking and inspection for deteriorated pumps/parts at the site (P.S) and in the workshop.
38	Deair Al Balah	Al Bassa P.S	Supply, install, and replace two duck foot for a 54kw flygt pump
39	Al Moghraqa	Al Moghraqa P.S	Supply and install upper bearings for flygt Submersible Pump, 22 KW
			Supply and install lower bearings for flygt Submersible Pump, 22 KW
			Supply and install set of mechanical seals for flygt Submersible Pump, 22 KW
			Checking and inspection for deteriorated pumps/parts at the site (P.S) and in the workshop.
40	Bait Hanoun	Al Sultan Abdul Hamid P.S	Supply and install upper bearings for flygt Submersible Pump, 32 KW
			Supply and install lower bearings for flygt Submersible Pump, 32 KW
			Supply and install set of mechanical seals for flygt Submersible Pump, 32 KW
			Checking and inspection for deteriorated pumps/parts at the site (P.S) and in the workshop.
41	Bait Lahia	Dawa'as P.S	Supply and install upper bearings for KSB Submersible Pump, 5.9 KW
			Supply and install lower bearings for KSB Submersible Pump, 5.9 KW
			Supply and install set of mechanical seals for KSB Submersible Pump, 5.9 KW
			Checking and inspection for deteriorated pumps/parts at the site (P.S) and in the workshop.
42	Rafah	Al Junina Sewage P.S	Rewinding the electrical motors of Sewage multi-manufacturer pumps of 54 KW
			Supply and install upper bearings for flygt Submersible Pump, 54 KW
			Supply and install lower bearings for flygt Submersible Pump, 54 KW
			Supply and install set of mechanical seals for flygt Submersible Pump, 54 KW
			Checking and inspection for deteriorated pumps/parts at the site (P.S) and in the workshop.
43	Al Nussirat	Al Hassaina P.S	Supply and Install local manufacturer Impeller for Sewage multi-manufacturer pumps, Flygt 54 KW
			Supply and install upper bearings for flygt Submersible Pump, 54 KW

			Supply and install lower bearings for flygt Submersible Pump, 54 KW
			Supply and install set of mechanical seals for flygt Submersible Pump, 54 KW
			Checking and inspection for deteriorated pumps/parts at the site (P.S) and in the workshop.
44	Bait Lahia	Amer P.S	Rewinding the electrical motors of Sewage multi-manufacturer pumps of 125 KW
			Supply and install upper bearings for flygt Submersible Pump, 125 KW
			Supply and install lower bearings for flygt Submersible Pump, 125 KW
			Supply and install set of mechanical seals for flygt Submersible Pump, 125 KW
			Checking and inspection for deteriorated pumps/parts at the site (P.S) and in the workshop.
45	Bait Lahia	Al Mashroaa' P.S	Supply and install a complete package of 54kw, Flygt type sewage submersible pumping unit

Table 17: list of major repairs/ Heavy machineries

Item	Municipality	Governorate	Machine	Description	Amount \$	Donor
1	Beit Hanoon	North	Loader 950G	Supply and install new turbo, oil cooling system and new Battery 110A, maintenance of gear box unit	10,000.00	ICRC
2	Jabalia	North	Jetting truck Iveco	Supply and install Jetting hose 1", new Battery 2*110A, Supply and install tires 6*22.5-13	5,930.00	ICRC
3	Jabalia	North	Jetting truck Volvo	Supply and install Rear spring ,Supply and install tires 6*22.5-13	4,050.00	ICRC
4	Um Annasser	North	MS Tractor	Supply and install Motor starter, steering arm joints, drive shaft hydraulic pump, all filters, complete set for front & rear lights and new Battery 170A	1,600.00	ICRC
5	Um Annasser	North	Mazda E2200 Truck	Complete overhauling for main engine, Supply and install Motor starter, new rear drum, supply and install tires 2*155/13+2*190/15	2,340.00	ICRC
6	Deir Albalah	Middle	Jetting Truck Volvo FL6	Complete overhauling for main engine, Differential of drive shaft, cooling system, air system, maintenance of steering joints, supply and install jetting hose1", complete disc and clutch set, Supply and install PTO system, battery 2*160A	20,670.00	ICRC

7	Nusairat	Middle	Wheel loader E936	supply and install upper break pump, completer hydraulic selector set, main hydraulic pump	5,395.00	ICRC
8	Nusairat	Middle	Savana GMC	supply and install complete main engine system, maintenance of whole car body including painting and all furniture requirements, supply and install tires 4*195/15"	4,790.00	ICRC
9	Bureij	Middle	Wheel loader E936	supply and install water radiator, water pump, air compressor, turbo, fuel injectors, maintenance of electrical system, supply and install complete wind shield glass	6,945.00	ICRC
10	Bureij	Middle	MS Tractor	supply and install water radiator, water pump, steering joints, driver seat, front light set, engine starter, alternator, exhaust system, jetting hose1", maintenane of break system, maintenance of the rear wheels core, maintenance of electrical system, supply and install complete wind shield glass	5,588.00	ICRC
11	Bureij	Middle	Nissan winner truck	Complete overhauling for main engine, maintenance of whole car body including painting and all furniture requirements, maintenance of break system, Maintenance of front and rear suspension system	4,940.00	ICRC
12	Zawaidah	Middle	Toyota Truck	Complete overhauling for main engine, maintenance of whole car body including painting and all furniture requirements, supply and install water pump, radiator, tires 2*190/15"	4,520.00	ICRC
13	Maghazi	Middle	Mitsubishi L200 truck	Maintenance of whole car body including painting and all furniture requirements, supply and install steering oil pump, all filters, general maintenance of electrical network	2,380.00	ICRC

14	Wadi Alsalqa	Middle	SUZUKI	Maintenance of whole car body including painting and all furniture requirements, supply and install water radiator, rear break unit, battery 80A, maintenance of break system, steering system, supply and install tires 2*215/15, general maintenance of electrical network	3,375.00	ICRC
15	Wadi Gaza	Middle	Mitsubishi L200 truck	Maintenance of whole car body including painting and all furniture requirements, supply and install turbo, front break unit, battery 110A, maintenance of water radiator, supply and install tires 2*205/16, general maintenance of electrical network	3,340.00	ICRC
16	qarara	Khanyounis	Toyota Truck	maintenance of Gear box unit, diesel pump, general maintenance of electrical network	1,142.00	ICRC
17	qarara	Khanyounis	SEAT Truck	Complete overhauling for main engine, Supply and install complete gear box unit	2,245.00	ICRC
18	Fukhari	Khanyounis	MS Tractor	Complete overhauling for suction pumping unit, Supply and install bearing set for wheels, maintenance of oil pump, maintenance of break system	4,718.00	ICRC
19	Bani Suhaila	Khanyounis	Nissan suction truck	Complete overhauling for main engine, Supply and install air compressor, turbo, maintenance of air compressing system, supply and install battery 2*110A	5,570.00	ICRC
20	Bani Suhaila	Khanyounis	Volvo FH12 truck	Supply and install hydraulic pump, maintenance of drive shaft , supply and install tires 6*24/1200	5,000.00	ICRC
21	Abasan Jadida	Khanyounis	Nissan suction truck	Supply and install complete engine unit	6,365.00	ICRC
22	Khuzaa	Khanyounis	Nissan suction truck	Supply and install complete gear unit, battery 150A clutch hydraulic pump, tires 2*22.5-295/80, maintenance of suction system	10,310.00	ICRC

23	Khuzaa	Khanyounis	Wheel loader G950	Maintenance of front bucket with new protection edge, maintenance of control transmission unit.	5,110.00	ICRC
24	Abasan Khabira	Khanyounis	Nissan suction truck	Supply and install complete engine unit, new battery 110A, tires 2*100/20, maintenance of suction system	11,830.00	ICRC
25	Khanyounis	Khanyounis	Backhoe loader CASE	Supply and install Gear hydraulic pump, operating hydraulic pump.	3,025.00	ICRC
26	Beit Lahia	North	Wheel loader G950	Complete overhauling for main engine, supply and install transmission system valves, turbo, maintenance of ejects pins.	15,560.00	ICRC
27	Rafah	Rafah	Mack Jetting truck	Supply and install disc and clutch set, battery 150A, jetting hose 1", front windshield glass, complete gear unit, tires 315-80/22.5, maintenance of jetting hose cylinder.	8,400.00	ICRC
28	Rafah	Rafah	Mack Jetting truck	Supply and install water radiator, maintenance of break system, air network, general electrical networks, hydraulic pipes and system, differential gear unit, new side warning lights.	4,400.00	ICRC
29	Rafah	Rafah	Toyota Truck	Supply and install disc and clutch set, break pump, front cylinders for break system, maintenance of electrical networks.	1,020.00	ICRC
30	AL Shoka	Rafah	Wheel loader G950	Supply and install water pump, water radiator, battery 110A, bearing set for water pump, rubber wheel for water pump, pressure hose for cooling system, valve set for ejects system, maintenance of main ejects system, steering ejects, hydraulic parts and connections.	13,550.00	ICRC
31	Al Nassir	Rafah	Toyota Truck	Supply and install disc and clutch set, front& rear head lights, battery 100A	1,150.00	ICRC

32	Al Nassir	Rafah	Tractor	Supply and install main hydraulic pump, water pump, water radiator, motor starter, damaged wind shield glass, front head lights, battery 150A, maintenance of water tank body	5,640.00	ICRC
33	Gaza	Gaza	Mack Jetting truck	Supply and install hydraulic pump, jetting hose 1", steering joints, sensor for gear hand, slewing ring gear, slewing ring gear 1", tires 4*315/80R22.5.	6,645.00	ICRC
34	Gaza	Gaza	International truck	Supply and install PTO, jetting hose 1", steering joints, , slewing ring gear, tires 4*315/80R20.	8,745.00	ICRC
35	Gaza	Gaza	Wheel loader CASE	Supply and install break ring, brake disc, oil seal for wheel	9,454.00	ICRC

2. ACTIVITIES PROGRESS

2.1 Geographic Information System (GIS)

During 2020 GIS department at the CMWU has developed a new web application include and not limited to all the water and wastewater facilities data and information as well as pictures to each facility. The web application can be used in smart phones (IOS and Android systems) as well as desktop interface and can be reached at <https://gis.cmwu.ps>.

2.2 Environmental Management Plan (EMP)

CMWU has monitored and analyzed the water quality in the domestic water wells (twice a year), in addition to wastewater collection and sampling for all WWTPs on a weekly basis.

3. OTHER ACTIVITIES

Other activities have been running to enhance the performance of CMWU as well as strengthen the relationship between CMWU and PWA through enhancing the management relationship between each other, as well as other activities between the CMWU and funding agencies through close follow up and transparent financial procedures.

The following activities illustrate the CMWU other activities;

3.1 Enhance the identity of the CMWU as fully functional service provider:

- CMWU Board of Directors has agreed on a decision that all municipalities who receive O&M services from the CMWU should pay 10 % of the O&M cost to the CMWU account. This step was applied for all the municipalities whereas some municipalities paid their dues on a monthly basis.
- Restructuring CMWU head quarter and regional offices for better performance.
- Expand the CMWU work activities to integrate extra municipalities in the utility system.
- Enhance the interface management between CMWU and PWA by regular meeting and close coordination.
- Municipality of Gaza and Jabalia have re-joined the CMWU.
- CMWU in cooperation with the MoLG and the PWA finalized MOUs for the municipalities that receive desalinated water, and signed them
- A consultancy service for transferring the CMWU to regional water utility has been launched by PWA through AFD finance.
- CMWU operates the new WWTPs in accordance with the water law,
- CMWU has prepared and published the O&M budgetary plan as a holistic view to operate and maintain the WASH systems including the strategic facilities

3.2 Continuity of Services during COVID-19 Outbreaks:

Despite of all challenges including Corona pandemic, CMWU in cooperation with WASH departments at municipalities has succeeded to operate WASH facilities to keep the acceptable level of services for all Gaza Strip. In the meantime, all WASH facilities, CMWU and municipal teams have been provided with the needed safety tools and equipment to avoid infection during the work.

In addition, the CMWU cooperated with MOH in order to connect the quarantine centres with water and wastewater networks including:

- European hospital through ICRC fund
- Dair Al Balah QC (water network) through ICRC fund
- Rafah QC (water & WW network)
- Turkish hospital (wastewater network)

CMWU partners have cooperated and provided the CMWU with emergency needs to enable the CMWU to control the situation, these supports included

- 1- supplying sterilization materials, face masks and gloves for CMWU and municipalities operation teams, through NRC, IR, HA, GIZ fund.

- 2- supplying chlorine for disinfection purposes in wastewater pumping stations and WWTPs, through ICRC fund
- 3- supplying chlorine and chemicals for water facilities (water wells and desalination plants)

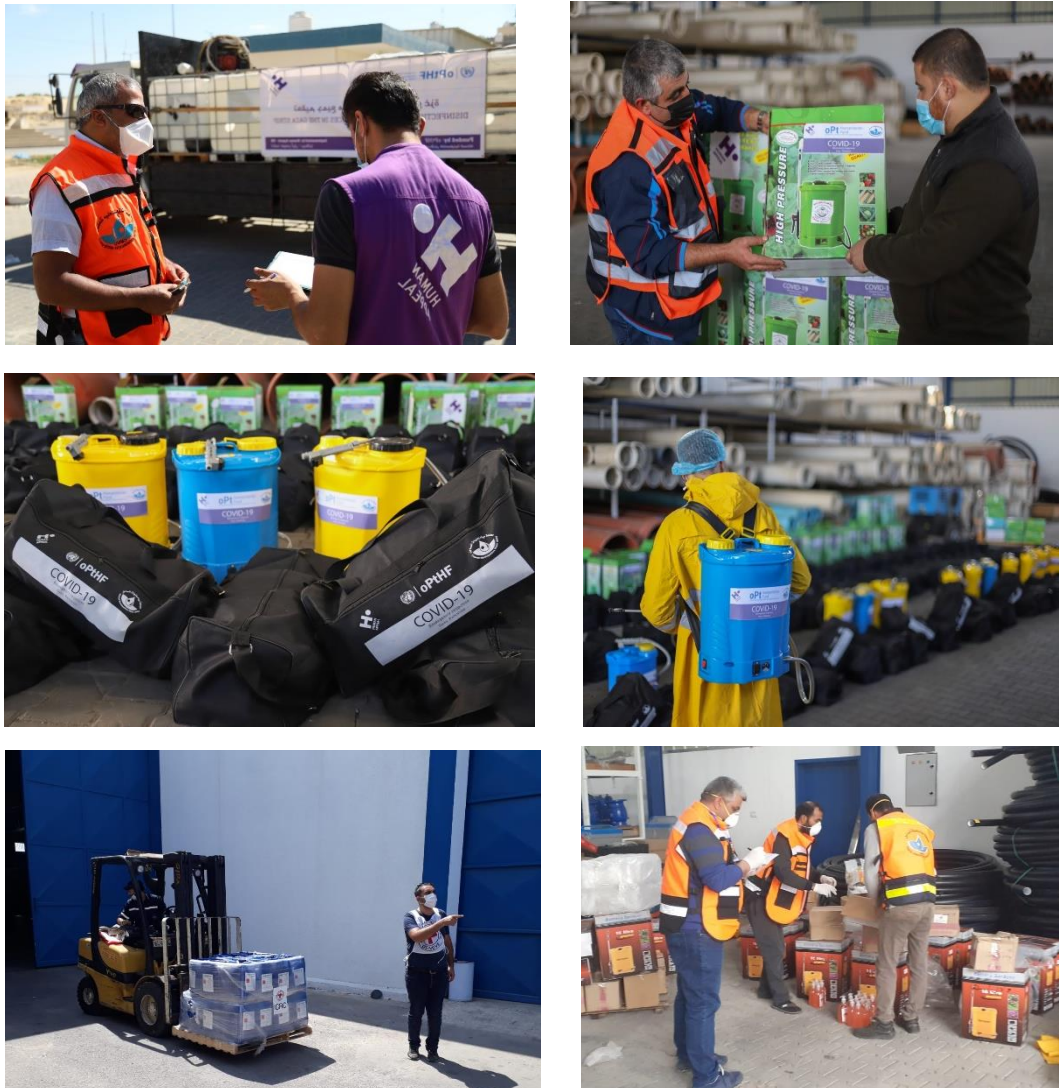


Figure 54: Supplying Hygiene and safety tools to CMWU

3.3 Coordinate with other entities:

As known since the establishment of CMWU, all the projects for either development or for emergency are funded from different donors until CMWU could stand alone for its facilities operation and maintenance as well as developmental projects. The following are the on-going activities in cooperation with PWA and other donors' agencies as;

IsDB: is still financing the remaining packages of sea water desalination plant in Gaza city 10,000 m³/day. Also, IsDB is committed to finance during 2021, the construction of PV solar plant for KHHWTP, refurbishment and rehabilitation of sewage pumping system in Khan Younis, in addition to construction wastewater networks at Al Fokhari

UNICEF: still financing the second phase of STLV (SGDP) desalination plant, in addition to launching and financing during 2021 two projects: providing 6 of water & Wastewater facilities with PV solar system, and construction stormwater network in Khan Younis

ICRC: has financed different projects which aim to improve the operational schemes and assure continuity of water and wastewater services. The last projects supported by ICRC are, providing PV system for Canada water tank, maintenance works and providing the Second power line for wastewater facilities, maintenance of heavy machines,

KFW: will partially finance the operation and maintenance cost of Gaza central WWTP for the coming 5 years, KFW has allocated 20M Euros for water sector MIP (Multi sectorial program) the fund is allocated for Energy Management Program

EU: is still financing the expansion of seawater desalination plant STLV at the southern governorate to reach 20,000 m³/day by adding additional 14,000m³/day. In addition to financing the storm water project at Rafah and PV solar energy for some Wash facilities. Already the CMWU in cooperation with EU, PWA and MOF started the projects' preparation

GIZ: is financing "COVID-19 Related Emergency Support to Essential Service Provision", the financed program includes supply spare parts and chemicals, repair& maintenance works for WASH facilities, public awareness activities related to COVID-19, the tenders have been launched to start implementation early 2021.

Oxfam: has financed rehabilitation and maintenance of 16 RO desalination units through Gaza Strip, and providing 6 RO plants with PV solar system. In addition, Rafah WWTP has been rehabilitated through Oxfam fund.

SC: in cooperation with CMWU, SC has equipped 3 water wells with PV solar energy, in addition to implementing stormwater pumping station and its force main for Al Saftawy storm water basin.

AAH: in cooperation with CMWU; AAH has completed rehabilitation of 14 Ro units at the southern governorates, providing 10 Ro units with PV system, maintenance and rehabilitation works for 3 water wells and sewage pumping stations at Khan Younis. Recently, AAH is financing rehabilitation of 20 RO plants and providing 10 RO plants with PV solar system.

NRC: in cooperation with CMWU, through OCHA fund has completed the preparedness and winterization activities at the middle and southern governorates. In addition, NRC is financing chlorine supply for water disinfection, besides rehabilitation of 2 RO plants and equipping them with PV solar system.

Other Ngo's: CMWU has been keeping the communication with all NGO's that are working in the water sector in order to work within master plans and its defined projects and targets.

3.3 Missions to CMWU Facilities:

During the period of this report, many donors' agencies and diplomatic missions have been postponed due to COVID-19 outbreaks, the limited visits took place in the sea water desalination plants, WWTPs and some facilities that needs interventions to rehabilitate or upgrade, the following are the main visits:

- On February 2020, EU mission visited different facilities which will be targeted under EU WASH programs
- On February 2020, Minister of MOLG accompanied with CMWU had visited Gaza WWTP
- On February, signing MOU between PWA Minister Mr. Mazen Ghonaim and Eng. Monther Shoblaq for delegation the CMWU to operate the three existing STLVs plants.
- On February 2020, in the presence of PWA Minister Mr. Mazen Ghoniam, CMWU participated in the conference organized by Al Aqsa university about water situation in Gaza Strip.
- On February 2020, an opening ceremony for Al Amal stormwater project has been held in the presence of Mr. Mazen Ghonaim ,the Ministerial delegation, IDB representatives, CMWU and Emmar palestine
- On February 2020, an opening ceremony for Al Safa Water Tank has been held in the presence of Mr. Mazen Ghonaim ,the Ministerial delegation, CMWU and Emmar Palestine
- On September 2020, Ministerial delegation visited the CMWU HQ to discuss the water sector needs and challenges.



- On November 2020, Academic team from Islamic university visited the CMWU HQ to discuss the cooperation between universities and the CMWU.
- On December 2020, EU- ambassadors accompanied with UNICEF and PWA visited the Southern STLV site, to follow up the progress of the expansion project.



Figure55: Ministerial and donors' missions

3.4 Public awareness campaigns:

Public Awareness campaigns implemented during the last year relied on the methodology of raising the public awareness messages mainly about COVID-19 either to customers or to CMWU and Municipal operation teams, besides the other awareness activities related to water and wastewater projects. the media and awareness activities are summarised below:

- Preparing the relevant media and awareness programs for several water and wastewater projects. Including the following topics
 - Saving water
 - Paying Water Bills
 - Cleaning tanks



▪ Water situation in Gaza Strip

- Preparing public awareness materials about COVID-19 and sharing it with partners and Municipalities.
- Conducting Awareness sessions about COVID-19 for CMWU and Municipalities technical teams.
- Coordination for scientific trips and accompanying the visitors to different water and wastewater facilities.
- preparing the design and printing posters either for water and wastewater projects or for CMWU other activities.
- Assisting CMWU partners to organize different workshops related to public awareness campaigns, besides hosting many of workshops in the CMWU headquarter.
- Ceremonies: 4 projects' opening ceremonies have been conducted during 2020.
- Publishing CMWU news on social media and newspaper



Figure 56 CMWU Public Awareness Activities

MAIN OBSTACLES

One of the main and major obstacles towards continuity of water and wastewater services during 2020 was Corona pandemic, it released severe effects on all sectors in Gaza Strip including water sector; hence, the CMWU as a service provider was in front of difficult challenge since the situation requires keeping WASH facilities operational all the time to meet the increase in water demand and to discharge the generated wastewater in a safe way, that added burdens on the CMWU which already suffers from lack of emergency resources like (Fuel for standby generators ,spare parts for maintenance jobs, safety and protection materials, ..etc) added to that; the effect of siege forced on the Gaza commercial borders towards importing the necessary goods to finish the works.

Moreover, the catastrophic shortages and unreliability of electricity power supply has severely and adversely affected the whole pumping and treatment systems of water and wastewater services. Also, standby electricity Diesel generators located at various sites were heavily and in somehow harmfully affected with long term operating schemes to keep and protect the services provided to the people of Gaza.

Over the last years the operational electrical demand for the water and wastewater facilities was 45 MW , where it has increased to around 75 MW since the central facilities (WWTPs and STLVs) entered the operation mode during 2020.

Fuel, abuse of the generators, besides the fluctuated electrical current are the reasons behind the high operation and maintenance costs.

Depreciation of the economic situation still affects negatively the collection efficiency during the year, besides the inherited tariff; which is low in comparison to the actual services costs.

Operation of strategic facilities like WWTPs, STLVs and reservoirs has put an extra financial burden on the CMWU.

SUCCESS STORY**COVID-19 WASH Response Plan**

As a prior mitigation, CMWU with its partners have developed WASH response plan to mitigate Corona risks and to avoid any drop in the services. In August, 2020; the pandemic has spread in Gaza Strip and immediately after that Gaza Strip has been put under strict lockdown. Unfortunately, the epidemic is still active and affected negatively on the WASH services.

CMWU worked hard with all donors and partners in order to secure chlorination materials (Sodium hypochlorite solution) which is essential for water disinfection to ensure pumping safe water to the people.

In addition, the CMWU succussed to secure the chemicals materials for water desalination plants like (Antiscalant, caustic soda, SMBS, sodium hypochlorite solution) to avoid stoppage of the three sea water desalination plants and 100 brackish water desalination plants which are considered one of the main sources for safe drinking water in Gaza Strip.

Despite of the harsh socio-economic situation, Corona pandemic, continuation of siege and electricity shortages , the CMWU in cooperation with municipalities succeeded to provide acceptable water and wastewater services to all Gaza strip, and that achieved by the assistance of partners who helped the CMWU to bridge the gaps in O&M expenses by supplying spare parts, disinfection materials , chemicals, and implementation of various fast track emergency maintenance and refurbishment works.

The below are the main fast track interventions implemented after COVID-19 outbreaks:

- Connecting European Hospital and Turkish friendship hospital with the sewage collection System. Those two hospitals are the main hospitals dealing with the infected cases by CCOVID-19.
- Providing Safety cloths, Hygienic Hand cleaning Gel, Masks, gloves and other sterilization to all municipalities staff.
- additional 4 MCM of water produced from water wells.
- Distribution chlorine for disinfection for all municipalities.
- Providing the quarantine centres with fresh Water.
- Connecting the quarantine centres with the water networks.
- Collecting and treat the generated sewage from the quarantine centres.
- Public awareness sessions and brochures are provided.

Dr. Yousef Abu Al Reesh (Deputy of minister -MoH) thanked the CMWU for its support during this pandemic. Also, CMWU appreciates the efforts of partners “ KfW, UNICEF, NRC, Oxfam, AAH, Islamic relief, ICRC, Human appeal” for their valuable support during the pandemic.



Figure 57 Providing the Quarantine centers with water & WW services

CONCLUSION

In order to fulfil the National Water Plan in the reuse of wastewater, construction of desalination plants, management of the aquifer water, and increasing the efficiency of the distribution networks. PWA developed a strategy that is called CSO-G (Comparative Study of Options for Gaza). The aim of this strategy is to identify a rolling program of interventions that will represent a Palestinian consensus for addressing the current problems in the water sector in Gaza through list of interventions where the main are:

1. Short-term low-volume [STLV] desalination.
2. Improving the domestic water distribution network.
3. A Water and Health Monitoring Project.
4. Increased water imports from Israel.
5. Regional [high-volume] desalination.
6. Pilot wastewater treatment and reuse projects.
7. Large-scale wastewater and reuse programmes, after the treatment plants are completed.

In the meantime, to provide a new fresh water resources to the system, PWA in cooperation with CMWU has been looking for financing large projects especially largescale seawater desalination plants and waste water treatment plants even the current political situation is not stable in order to:

1. Bridge the gap between the water supply demand and the available quantities.
2. Improve the quality of the supplied water which will lead to mitigate the health hazards, especially for the poor people.
3. Relief the stress on the coastal aquifer of Gaza Strip and upgrade its reserve of water for the next generations.

CMWU shall keep looking for self-dependency specially to cover the operation cost for such chemical, biological lab creation and vehicles workshop.

CMWU shall expand and improve water bill issuance and collection efficiency in order to be able to recover most of its operational expenses.

CMWU shall follow up the staff transfer from the municipalities to the CMWU and follow up a clear business plan in order to reach the sustainability by 2025.

END

Annex 01

Average Wastewater Quantities and Treatment Efficiency for the WWTPs during 2020

WWTPs Records-2020												
		Influent					Effluent					
Facility	Total Quantity m3 in 2020	BOD (mg/l)	COD (mg/l)	TSS (mg/l)	PH	EC	BOD (mg/l)	COD (mg/l)	TSS (mg/l)	PH	EC	Av. Treatment Efficiency
RWWTP	5,532,697	538	1207	630	8	5117	125	276	99	8	6952	77%
KhWWTP (Laggons)	5,327,856	417	934	456	8	3697	72	154	59	8	3905	83%
KhWWTP (Sofa)	3,900,000	514	930	450	8	5500	7	33	18	8	5100	99%
Gaza (Al Sheikh Ajlin WWTP) Under maintenance year 2020	21,809,970	542	985	526	8	4833	178	350	126	8	5145	67%
NGEST	14,064,524	439		430.94	8.34	2523.45	12.34		18.84	8.01	2310.24	97%
Total Quantities	50,635,047											
Avg. Treatment efficiency for all		84%										

Facility	Effluent discharge
RWWTP	All treated WW is pumped to the sea
KhWWTP(Laggons)	All treated WW is pumped to the sea
KhWWTP(Sofa)	All treated WW is pumped to infiltration basins
Gaza(Al Sheikh Ajlin)	treated WW is pumped to the sea (during 2020, the average annual treatment efficiency affected by rehabilitation works which were executed during the third quarter of 2020, after these rehabilitation works the Treatment eff. has improved, it varies from 85%-88%

NGEST

treated WW is pumped to infiltration basins

Annex 2

ملخص تقرير الانجاز السنوي لمصلحة مياه بلديات الساحل لسنة 2020

اولا: الإنجازات الفنية:

يمكن تلخيص أهم المنجزات الفنية لمصلحة المياه خلال سنة 2020 بما يلي:

1- العمل على تحسين كميات المياه وذلك من خلال:

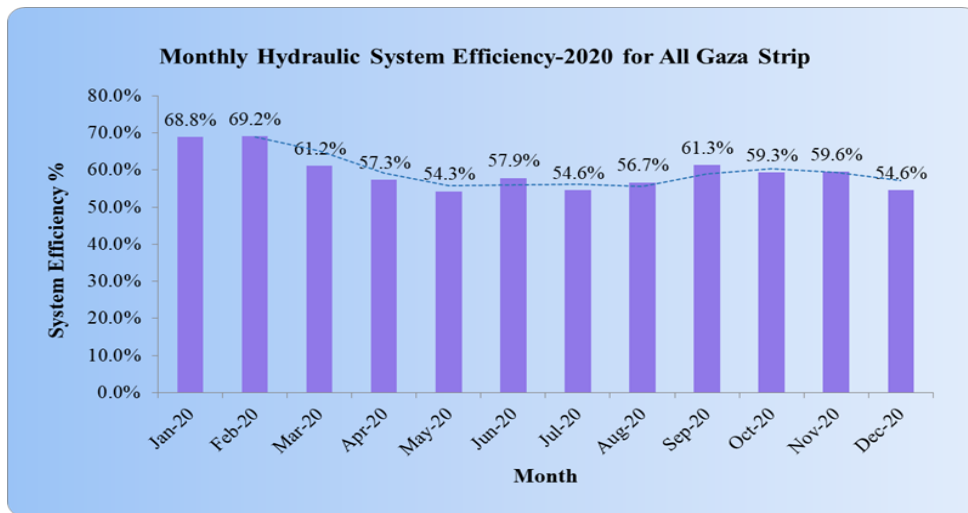
العمل على تقليل الفاقد في نظام التوزيع وتحسين كفاءة الشبكة: بالرغم من التحديات الكبيرة التي تواجه المصلحة وذلك من خلال:

1. دعم برامج الصيانة لشبكات المياه من خلال توفير قطع الصيانة والدعم الفني
2. متابعة قراءات عدادات انتاج المياه وجمع ومراجعة بيانات تحقيقات الجباية
3. تغيير العدادات المتعطلة للمحافظة على نسبة فاقد إجمالي في قطاع غزة لا تتجاوز 36%

المحافظة على تشغيل مرافق المياه بأعلى كفاءة وأفضل إنتاجية وذلك من خلال:

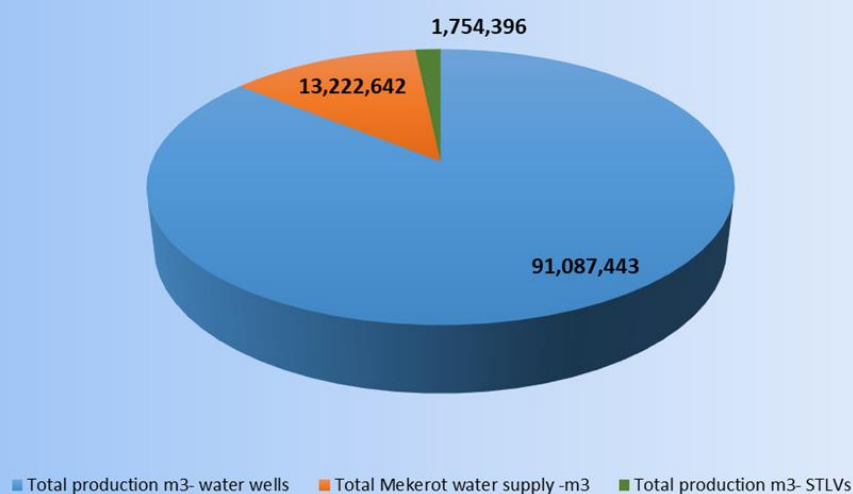
1. إجراء الإصلاحات والصيانة اللازمة للأبار ومحطات الضخ وتوصيل الكهرباء لبعض الأبار إضافة الى حفر أبار جديدة.
2. التدخل المستمر لورشة الصيانة المتنقلة للقيام بأعمال الصيانة المهمة في الشبكات والمرافق
3. تشغيل بعض الأبار باستخدام نظام التحكم والمراقبة الآلي (SCADA)
4. توفير الوقود اللازم لتشغيل المولدات حسب الكميات المتوفرة
5. تركيب وحدات طاقة شمسية لبعض المرافق ووصل مرافق حيوية بخطوط تغذية كهرباء بديلة
6. تحسين معدل استهلاك الطاقة في إنتاج وضخ المياه

وبلغت كميات المياه المنتجة من الأبار في قطاع غزة في سنة (2020) 91 مليون متر مكعب، كما بلغت كميات المياه المستوردة من مكروت 13.22 مليون متر مكعب وبلغ متوسط نسبة كفاءة تشغيل أبار المياه 98% في سنة 2020 في حين وصل معدل حصة الفرد من المياه المستهلكة 83 لتر /يوم .

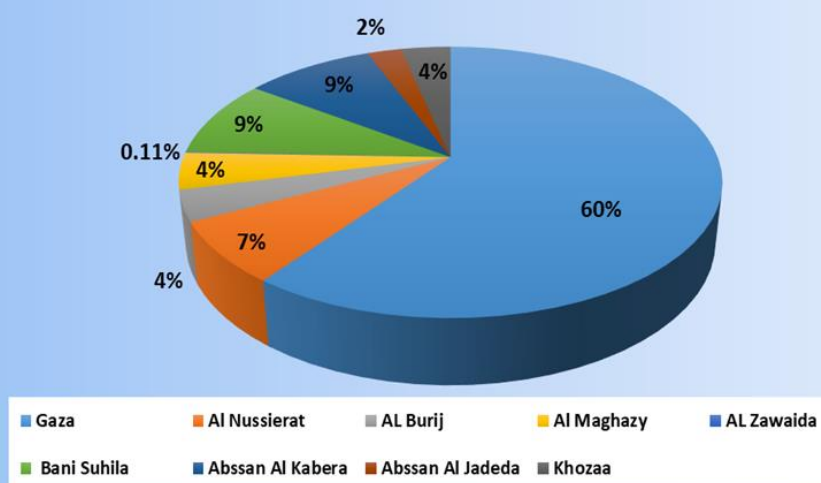


معدلات كفاءة شبكة المياه في محافظات قطاع غزة

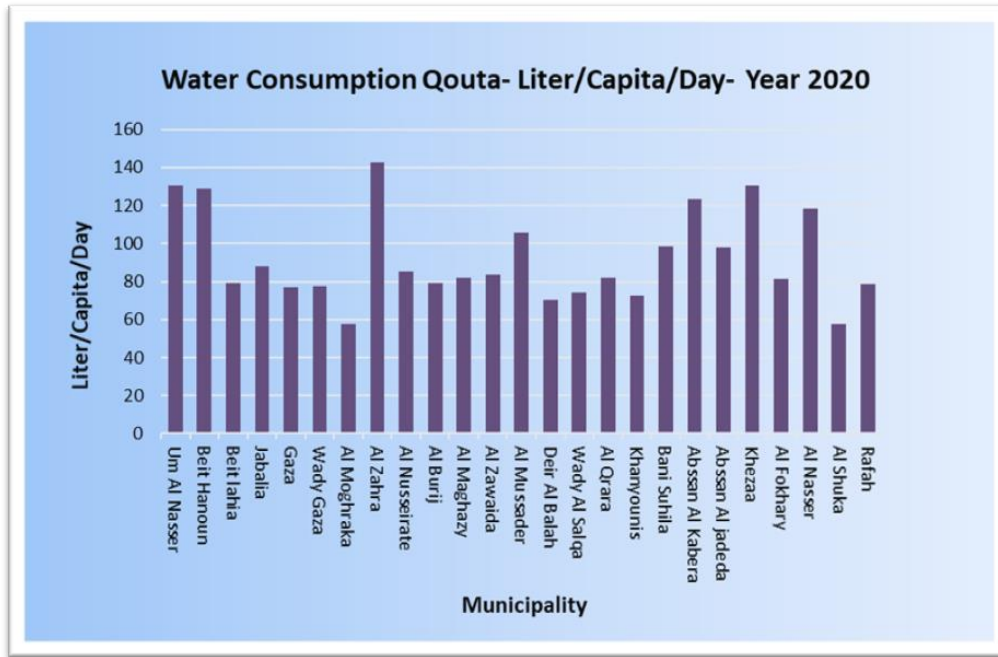
Water Supply Categories-2020, Gaza Strip



Mekerot Water Supply -2020, Gaza Strip



كمية المياه المنتجة والمستهلكة ونسب توزيع كميات مياه مكروت لكل بلدية خلال عام 2020



معدل حصة الفرد من المياه المستهلكة في كل بلدية

2- العمل على تحسين جودة المياه وذلك من خلال:

2.1 تطهير المياه:

- يتم التطهير باستخدام محلول الكلور (صوديوم هيبوكلورايت) الذي يتم توزيعه على الآبار ومحطات الضخ في كل مناطق القطاع. حيث تم توزيع 1000 متر مكعب من محلول الكلور (تركيز 10-12%) في عام 2020
- تقوم المصلحة بتطبيق نظام المراقبة لكفاءة نظام التطهير في جميع المناطق وجمع تقارير نتائج فحوصات الكلور الحر في المصدر وفي نقاط محددة في شبكة التوزيع.
- تقدم المصلحة الدعم الفني لطواقم التشغيل من خلال إصلاح مضخات حقن الكلور وتركيب مضخات جديدة وتوفير أجهزة فحص الكلور الحر.
- تدريب طواقم التشغيل العاملة في تطهير المياه لرفع كفاءتهم ولاتباع اجراءات الوقاية والسلامة.
- وصلت كفاءة التطهير في شبكة المياه الى 97.38% لسنة 2020

2.2 توسعة وتشغيل محطات تحلية المياه:

- تشغيل محطة تحلية مياه البحر القائمة بدير البلح (البصة) لتصبح طاقتها الانتاجية 6000 متر مكعب/ يوم
- تشغيل محطة تحلية مياه البحر على شاطئ دير البلح بتمويل EU بطاقة انتاجية 6000 متر مكعب/ يوم لخدمة كل من رفح وخان يونس وجاري العمل لتوسيع المحطة لتصبح طاقتها الانتاجية 20,000 متر مكعب/ يوم
- تم تشغيل محطة تحلية مياه البحر في السودانية لخدمة مدينة غزة بطاقة انتاجية 10,000 متر مكعب/ يوم بتمويل البنك الاسلامي للتنمية. ويتم خلطها بمياه الآبار في الخزانات وتخدم أكثر من 250,000 نسمة من سكان غرب مدينة غزة حيث لوحظ بشكل كبير الأثر الإيجابي لهذه المحطة على جودة المياه المزودة لسكان غرب مدينة غزة.

2.3 تشغيل وصيانة محطات التحلية القائمة:

- تزويد محطات تحلية مياه الآبار المالحة (100 محطة) بالمواد الكيميائية اللازمة لتشغيلها مثل الصودا الكاوية وحمض الهيدروكلوريك.
- المساعدة في صيانة وإعادة تأهيل هذه المحطات وتقديم قطع الغيار اللازمة للصيانة.
- تركيب نظام طاقة شمسية لمعظم محطات تحلية المياه المالحة القائمة حيث تم خلال عام 2020 تزويد أكثر من 20 محطة بالطاقة الشمسية وجاري العمل أيضا على تزويد عدد 10 محطات بالطاقة الشمسية

2.4 صيانة واستبدال شبكات المياه القديمة: حيث بلغ طول شبكات المياه التي تم إنشاؤها أو استبدالها حوالي 30 كم حتى نهاية 2020

- ### 2.5 إنشاء خزانات المياه: وتهدف الى تحسين جودة المياه من خلال خلط المياه الجيدة أو المحلاة مع مياه الآبار في الخزانات لتحقيق العدالة في جودة المياه لأكبر عدد ممكن من المستفيدين.
- تشغيل خزاني مياه في خان يونس (السطر والأمل) سعة كل منها 5000 متر مكعب
 - إعادة تأهيل محطات الضخ لعدد من خزانات المياه بالإضافة الى تزويد عدد 5 خزانات بنظام الطاقة الشمسية

3- تحسين جودة مياه الصرف الصحي:

3.1 محطات معالجة الصرف الصحي:

3.1.1 تشغيل المحطات القائمة: يوجد في قطاع غزة خمس محطات معالجة 3 محطات مركزية ومحطتين تعملان على المدى المتوسط وهي محطة الشيخ عجلين ومحطة رفح كما يوجد محطة تعمل بشكل مؤقت غزة غرب مدينة خان يونس سيتم اغلاقها بعد الانتهاء من تطوير منظومة الضخ التابعة لمحطة المعالجة المركزية (صوفا) بداية عام 2021 . وتقوم مصلحة المياه بمتابعة أعمال الصيانة والتطوير والتشغيل في هذه المحطات للمحافظة على أدائها لحين انتهاء دورها.

3.1.2 محطات المعالجة الجديدة:

I. مشروع إنشاء محطة معالجة غزة المركزية بقدرة 60 ألف متر مكعب/ اليوم بتمويل من KfW: تم الانتهاء من جميع الأعمال وجاري حاليا عمل التشغيل التجريبي للمحطة

II. مشروع إنشاء محطة معالجة خان يونس بقدرة 26,600 متر مكعب/ اليوم: بتمويل مجموعة من المانحين (ISDB (KDF), JIKA): تم الانتهاء من جميع الأعمال ويتم تشغيل المحطة حاليا بقدرة 15 ألف متر مكعب/ اليوم وهو اقل من القدرة الاستيعابية للمحطة وذلك لان المحطة تم تصميمها لخدمة 70% من سكان خان يونس و35% من سكان القرى الشرقية ونظرا لعدم وجود نظام صرف صحي في القرى الشرقية يتم حاليا استقبال مياه الصرف الصحي فقط من مدينة خان يونس.

III. محطة معالجة الشمال (NGEST) بتمويل مجموعة مؤسسات مانحة والبنك الدولي : تم تشغيل المحطة خلال 2020 من خلال طواقم سلطة المياه الفلسطينية وسيتم لاحقا تشغيلها من قبل مصلحة المياه بعد تأمين الدعم المالي للتشغيل حيث أن البلديات غير قادرة على تغطية هذه النفقات.

نظراً لصعوبة تأمين الكهرباء في محطات المعالجة على مدى الساعة وعدم كفاية الوقود لتشغيل المولدات بالإضافة الى وجود بعض أعمال الصيانة والتأهيل في محطة الشيخ عجلين لمدة تجاوزت 3 شهور فان ذلك أثر على كفاءة المعالجة السنوية خلال عام 2020 حيث بلغت 84% ، في حين أن هذه النسبة ستزداد بشكل ملحوظ خلال الربع الثاني من عام 2021 بعد دخول محطة غزة وخان يونس مرحلة التشغيل الكامل.

3.2 تصريف مياه الأمطار

تم الانتهاء من تنفيذ العديد من مشاريع تصريف مياه الأمطار أهمها:

- إنشاء حوض تجميع مياه الأمطار في رفح مع قناة تجميع رئيسية بتمويل من OCHA من خلال المجلس النرويجي. هذا المشروع حل مشكلة فيضان مياه الأمطار في منطقة العطار بشكل جذري.
- تأهيل وتنظيف حوض أمطار الجنيينية
- إنشاء خط تصريف مياه الأمطار في شارع الأقصى بدير البلج من خلال مؤسسة NRC.
- إنشاء حوض ترشيح مياه الأمطار في منطقة أصلان في بيت لاهيا بتمويل من البنك الإسلامي من خلال مؤسسة أعمار فلسطين.

3.3 الصرف الصحي:

تطوير شبكات الصرف الصحي

- إنشاء شبكة تجميع الصرف الصحي في رفح بتمويل من الهلال الأحمر التركي
- صيانة شبكات الصرف الصحي في مناطق متفرقة من قطاع غزة
- تجهيز وثائق العطاء لمشروع إنشاء شبكات صرف صحي في مدينة رفح بتمويل من PHG
- تجهيز وثيقة الشروط المرجعية لمشروع الخطة الشاملة لنظام الصرف الصحي لمحافظة خان يونس ، حيث يتم التعاون مع سلطة المياه لإيجاد التمويل الخاص بإنشاء نظام الصرف الصحي للقرى الشرقية من محافظة خان يونس.

أعمال الصيانة الالكتروميكانيكية لمحطات ضخ الصرف الصحي ومياه الأمطار:

- تم القيام بأعمال الصيانة الالكتروميكانيكية للعديد من محطات تجميع وضخ الصرف الصحي ومنها صيانة ما يزيد عن 33 مضخة، واستبدال ما يزيد عن 13 محبس و5 بارسكرين وغيرها الكثير.
- أعمال التنظيف لأكثر من 33 محطة في عام 2020.
- تجهيز عدد من المضخات المتنقلة العاملة بالديزل وتوزيعها لمختلف المناطق.
- الاستمرار في صيانة الآليات الثقيلة التي تخدم قطاع الصرف الصحي والأمطار.



أعمال صيانة وتنظيف غرف المضخات في محطات ضخ الصرف الصحي

ثانياً : إنجازات البرامج الأخرى:

- 1- نظم المعلومات الجغرافية:
تم تطوير قاعدة البيانات الخاصة بمرافق المياه والصرف الصحي بالإضافة الى ربطها ببرامج التشغيل و الصيانة لتلك المرافق حيث تم دعم هذا المشروع من اللجنة الدولية للصليب الأحمر.
تم تطوير موقع الكتروني للمستخدم لإمكانية الحصول على أي معلومات عن هذه المرافق.
- 2- خطة المراقبة البيئية:
وذلك من خلال القيام بالفحوصات الدورية لمياه الآبار ومحطات معالجة مياه الصرف الصحي.

ثالثاً : نشاطات أخرى:

- 1- تعزيز دور المصلحة كمقدم للخدمة: وذلك من خلال تعزيز مساهمة البلديات في دعم المصلحة في أعمال الصيانة.
- 2- العمل على تحويل مصلحة المياه الى مرفق إقليمي يضم كافة بلديات قطاع غزة
- 3- العمل على جذب بلديات أخرى للانضمام للمصلحة مالياً وخصوصاً بعد إعادة إنضمام غزة وجباليا للمصلحة.
- 4- تعزيز العلاقة والتعاون مع المؤسسات المانحة
- 5- الاستمرار في برامج التوعية الجماهيرية لزيادة الوعي لدى الجمهور حول الوضع المائي وأهمية مشاريع التحلية وترشيد المياه وأهمية دفع فاتورة المياه.
- 6- تقديم الدعم لكافة البلديات أثناء جائحة كورونا حيث تم توريد العديد من مواد التعقيم والالبسة الوقائية للعاملين في قطاع المياه والصرف الصحي بالإضافة الى قطع الغيار والمواد اللازمة لأعمال الصيانة الطارئة.
- 7- توصيل عدد من مراكز الحجر بشبكة المياه والصرف الصحي وذلك بالتعاون مع وزارة الصحة الفلسطينية
- 8- الحفاظ على تعقيم المياه بمادة الكلور لضمان تزويد السكان بمياه آمنة خلال جائحة كورونا.

المعوقات: أهم المعوقات التي واجهت المصلحة:

- جائحة كورونا والتي لا زالت تؤثر سلباً على سير العمل في كافة القطاعات.
- الحصار المفروض على القطاع.
- العجز الكبير في الطاقة الكهربائية
- التراجع الكبير في الوضع الاقتصادي مما أثر كثيراً على نسبة التحصيل