



State of Palestine

Coastal Municipalities Water Utility



Annual Progress Report 2012

Coastal municipalities Water Utility – CMWU

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Acknowledgment

This annual report has been prepared by the CMWU management team, which is mainly composed of all CMWU Activities progress during the year 2012

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CMWU would like to thank all other donors to their continuous support in financing water and waste water projects such as OCHA (HERF), ICRC, QRC, KFW, AFD, TRC, UNICEF, Oxfam, GVC, ANERA, UNDP, Muslim Hands, Islamic Relief, Save the children, and TIKA. Without their supports it would have been difficult to overcome many of the humanitarian problems, also their assistance to implement some of emergency measures in order to avoid environmental disasters and further deterioration of the water sector which resulted from the lack of big investments in this vital sector.

1.0 INTRODUCTION

During the past 6 years, the Gaza Strip has been fully under siege by IDF except for minimum requirements of living. This siege has caused several development strategies and plans to be in a noticeable delay and make all CMWU efforts as water and waste water service provider to keep the service running without any main or major breakdown. This has tighten the PWA and the CMWU from developing and implementing their plans by enhancing the services through delivering accepted water for drinking and other usage as well as construction of waste water treatment plants.

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 attract the donors to implement some of the developmental projects. Also, the Israeli siege on Gaza Strip is still partially hindering the CMWU and its partners in the donor's community of getting into Gaza Strip some of the needed equipments, materials and spare parts in order to improve the services provided to the inhabitants of the Gaza Strip,

CMWU teamwork continues to manage and implement various repair, refurbishment and overhauling works related to more than 190 water wells, 26 water Storage Tanks, 8 water desalination plants, 14 water booster stations, 42 wastewater pumping stations, 4 waste water treatment plants, water networks, storm water networks, sewage collection networks and basins with all associated equipments 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 lost. Therefore, many contracts launched during this period of the project, with local contractors for specialized maintenance and repair needs e.g. generators, deep well water pumping sets...etc.

The poor reliability of electrical power supply grid with overall difect of about 35% connecting the water and wastewater facilities including water wells , pumping facilities and treatment works continue with its harsh negative impacts to create a lot of damages and loss of services at various sites. In addition to the moderate production of Gaza power generation plant ranges from (50-75 MW), Gaza electricity Distribution Company (GEDCO) has continued to claim that the lack of regular fuel supplies and absence of materials make it impossible to do any upgrading or services improvement with this regard. Also, the shortages of fuel supply to Gaza strip affects the deliveries to around 20 water production sites which still have no connections to grid electric power supply.

PWA and several financing and humanitarian agencies e.g. World Bank, IDB, GCC, QRC, TIKa, TRCs, EC, ICRC, UNRWA, UNDP, UNICEF, GVC, OCHA (HRF), PAH, CARE, ACF, KFW and others have continued to play their great roles to assist and facilitate the delivery of fuel and materials but with limited capabilities and interventions, where strict accessibility controls provided against several materials and equipments to pass through the main commercial gates between Gaza and Israel makes it so difficult to fulfil the planned projects implementation programs in the due time.

2.0 TECHNICAL PROGRESS ACTIVITIES

This report describes the progress of each task at CMWU during the period from January 2012 to end of December 2012. The running activities are being classified into different categories such as water wells activities; water networks activities, Water Storage Tanks, wastewater networks and plants activities, mechanical and electrical activities, vehicles maintenance activities.

2.1 Water Wells

2.1.1 Wells Construction Progress:

Currently; Due to increasing demand for water in some areas (Deir El Balah, Khan Younis, Rafah and Gaza cities); during this period, many water wells are either in progress of construction to be ready for water production or have been put in operation. The following are a descriptive

1. Rehabilitation and upgrading of Malaysian Water Well in Al Shoka – Rafah (CMWU-IDB/GCC NS W 06-01-2012): This well was operated on November 2012.
2. Construction of water well in Al Qarara area funded by Muslim hands in progress.
3. Also the CMWU followed up the following water wells activities with different municipalities
 - Al Jamaia water well at Deir Al Balah: carry out the pumping test.
 - Haiteen water well: carry out pumping test and design the stainless steel filter.
 - Preparing the tender documents for Al Buraij water well
 - Assess and follow up the repair works for Al Nadi water well in Beit lahia.
4. Yafa water well at Jabalia: follow up the pumping test.



Fig(1) – Al Malaysian Water Well

2.1.2 Electromechanical Progress

CMUW 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 reservoirs 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).

During the period of this report the works include installation of both high and low tension electrical grid lines with all associated transformers for different water wells have been already initiated as it will be detailed here-below. There are still other facilities waiting the materials entry to Gaza Strip in order to complete connecting all the facilities with electricity.

Supply and installation of several standby power supply generating sets at various water wells and pumping sites to overcome the problems of electricity cutoffs which used to occur daily in Gaza.

Moreover, CMWU has succeeded to continue the implementation of the following works in water wells at different areas;

- Completed the electrical connection installations of TIKa water well in Rafah
- Completed the connections installation of electricity grid lines to 10 water sites (wells, desalination plants) including remote monitoring and control system as per TIKa funded project.
- Continue to carry out all recalibration, adjustment and electrical repairs of soft starters and re-operating water wells at different areas of the Gaza Strip. The records of such works show more than 60 electrical repair jobs were carried out and completed.
- Manage and carry out usual inspection of electrical panels and the generators all over the water wells facilities.
- Carry out several upgrading and refurbishment of electrical installations of lighting system and chlorination pumps at different water wells and pumping facilities all over the Gaza Strip.
- Follow up, supervision, revision and taking over of all new control panels installed at different water wells and booster stations all over the Gaza Strip.

- Supervise and implement the optimum selection of vertical turbine water pumps with high efficiency to achieve energy savings as per cubic meter of water produced.
- Manage the installation of dosing pumps and chlorination equipments at the wells' exits to safeguard the water supplied against any risk of contamination ensuring that the water supplied to the customers is well disinfected with positive residual chlorine levels detected.

A) Standby power supply facilities:

More than 200 standby generators located throughout water and wastewater facilities of rated power ranges from 50KVA to 900KVA are continued to be well maintained, repaired and serviced by CMWU team works and specialized repair and service contracts arranged with local generators dealers.

During the period of this report and as a result of unreliable grid electricity power supply, the generators have continued to be heavily and severely affected by long daily hours of operations which create lots of repair and maintenance needs and parts. The repair records show that more than 150 predictive, preventive and corrective maintenance job orders were carried out and applied at various areas.



Fig (2) - 88 KVA generator in AlShokah on line booster station

B) Water meters:

During the period of this report, 10,000 water meters besides 100 bulk meters were supplied to CMWU stores through IsDB fund in addition to water fittings for maintenance purposes. While 1300 customers' water meters of different sizes have been completely installed at different areas of the Gaza Strip. Also, 3 production meters of sizes 4", 6" and 8" have been installed at various water wells and other facilities for water production and supply monitoring program.



Fig (3) – Supply of Water Meter

C) Mobile mechanical maintenance and repair workshop

- The mobile mechanical service maintenance unit established by CMWU continues to repair many of the municipal water wells faults which used to be repaired in the past by private services.
- Mechanical repairs and refurbishment of ten water pumping manifolds for both water and wastewater pumping stations.
- Repair and adjustment of 6 water meters for water wells exits
- Arrange for all metal works installations required to connect Abu Medain water well to Al Burij municipal water networks
- Mechanical repair of water distribution valves on the network
- Carry out several water and wastewater networks repairs ,replacement and reconnection works at various CMWU areas along Gaza strip.
- The team was involved in different emergency repairs required at various water and wastewater sites in Gaza strip . e.g repair and rectify mechanical breakdown of Gaza sewage pumping station 7B and eliminate the risk of flooding.

2.1.3 Wells Functionality Progress

Water wells operating hours have been continued to be 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 has been traced and calculated for the targeted period from which the functionality efficiency reaches 90%.

Despite of the continuation several operational constraints and difficulties of 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 safeguard the level of functionality for water wells which represent the major source of water in Gaza strip. Also, it is worthy 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 has 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 wells out of 194 water production wells at the same time out of service waiting for repair or refurbishment.

The registry of major mechanical and electrical repairs and maintenance job orders showed that during this period 122 job orders of main mechanical and electrical repair upgrading were carried out and technically categorized as follows:

- Follow up the repair and maintenance of electrical faults related to pumps electrical drive motors and associated systems.
- Electrical upgrading and repair of control switchboards
- Power supply connections and cabling between the grid and the electrical control switch board.
- Repair and upgrading of PLC controllers
- Replacement of control instrumentation e.g. pressure switches...etc
- Continue to carry out remote monitoring system for water wells, where additional 10 sites have been added to the existing system of four pilot water wells sites .The system was initially designed to register for faults notification and some data acquisition.
- Mechanical repair of deep well vertical turbine water pumping sets and submersible pumps of water wells.
- Refurbishment and repair of water wells' exit pumping manifolds.
- Replacement of deteriorated sand removal hydro cyclones.

The following works represents part of the main categories listed here above:

- Carry out 34 jobs of repairs, replacement, new installations and M&E works for chlorine dosing systems which are essentially required for water disinfection systems throughout all water production facilities.
- Manage and carry out complete mechanical overhauling and refurbishment of pumping manifolds of water wells where 15 sites in Khanyounis and Rafah and the middle area have been covered during the period of this report.

2.1.4 Water Quality Monitoring Progress

During the period of this report from January 2012 till December 2012 the following activities have been carried out and applied as follows;

- a) Supply and distribution of Sodium hypochlorite solution of 10% -12% active chlorine concentration for all water production wells and pumping facilities, all as per supply and delivery contracts signed with the supplier called here Ismael Alaiwa Co. and funded by GCC/IDB. The records shown in table No. (1) states that a total quantity of 800 m³ of sodium hypochlorite solution were distributed for all Gaza Strip water wells and pumping facilities.

Moreover ,the task includes as well for supply and distribute different water treatment chemicals listed here below for seven brackish water desalination plants each of 50m³/hr and one sea water desalination plant of 30m³/hr, all as per the same delivery contracts of sodium hypochlorite .

• Hydrochloric acid 33%	25	ton
• Caustic soda 50%	5	ton
• Anti-fouling agent	7	ton
• SBS	1.5	ton
• Citric acid	1	ton
• BTi	500	liter



- b) Manage and carry out field residual chlorine monitoring program essentially provided to follow up the effectiveness of disinfection throughout 550 sampling points spread all over the water network and wells exits in Gaza strip. Field records and reports generated from sites photometric measurements showed that during the period of this report from January 2012 to December 2012 the disinfection efficiency have been closely achieved, where average annual efficiency of 99.3% is shown and illustrated as per table and figure provided here below .

Table No. (1): Water Disinfection Monitoring Program

No.	Municipality	Total No. of sample	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12
			Positive Samples	Positive Samples	Positive Samples	Positive Samples	Positive Samples	Positive Samples	Positive Samples	Positive Samples	Positive Samples	Positive Samples	Positive Samples	Positive Samples
1	Um Al Nasser	9	9	9	9	9	8	8	8	9	9	9	9	8
2	Beit Hanoun	19	19	19	19	19	19	19	19	19	19	19	19	19
3	Beit lahia	26	26	26	24	25	26	26	26	26	26	26	26	26
4	Jabalia	42	42	42	42	40	42	42	42	42	42	42	42	42
5	Gaza	86	84	84	85	86	85	85	85	84	84	84	85	85
6	Wady Gaza	8	8	7	8	8	8	8	8	8	8	8	8	8
7	Al Moghraka	12	12	12	12	12	12	12	12	12	12	12	12	12
8	Al Zahra	12	12	12	12	12	12	12	12	12	12	12	12	12
9	Al Nusseirate	24	24	24	24	23	24	24	24	24	24	24	24	24
10	Al Burij	20	20	20	20	20	20	19	19	20	20	19	20	20
11	Al Maghazy	24	24	24	24	24	23	24	24	22	24	24	24	24
12	Al Zawaida	24	24	24	24	24	24	24	24	24	24	24	24	24
13	Al Mussader	11	11	11	11	11	11	11	11	11	11	11	11	10
14	Deir Al Balah	30	30	30	30	30	29	29	30	30	30	30	30	29
15	Al Qrara	18	17	17	18	18	17	18	18	18	18	18	18	18
16	Khanyounis	44	44	44	44	44	44	44	44	44	44	44	44	44
17	Bani Suhila	20	20	20	20	20	20	20	20	20	20	20	20	20
18	Abssan Al Kabera	18	17	17	18	18	18	18	18	18	18	18	18	18
19	Abssan Al jadedda	16	16	16	16	16	16	16	16	16	16	16	16	16
20	Khezaa	16	16	16	15	16	16	16	16	16	16	16	15	16
21	Al Fokhary	12	12	12	12	12	12	11	12	12	12	12	12	12
22	Al Nasser	12	12	12	12	12	11	12	12	12	12	12	12	12
23	Al Shuka	12	12	12	12	12	12	12	12	12	12	12	12	12
24	Rafah	46	46	46	46	46	46	46	46	46	46	46	46	46
Total		561	557	556	557	557	555	556	558	557	559	558	559	557
Monthly Disinfection Efficiency %			99.29%	99.11%	99.29%	99.29%	98.93%	99.11%	99.47%	99.29%	99.64%	99.47%	99.64%	99.29%
Annual Disinfection Efficiency %			99.32%											

NO.	Municipality	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	Total
		m ³	m ³	m ³	m ³	m ³	m ³	m ³	m ³	m ³	m ³	m ³	m ³	2012
1	Um AL Nasser	13100	11360	11390	14700	16670	17570	18530	19590	17640	17280	17000	17000	191830
2	Beit Hanoon	275990	237380	390160	323120	324710	344110	235430	321540	325461	320880	265342	275841	3639964
3	Beit Lahia	503386	464146	505927	564603	558048	541083	540529	651542	635463	604303	584713	580000	6733743
4	Jabalia	966852	899314	834709	1017276	963093	1009119	1091508	1215404	1000000	1000000	1000000	1000000	11997275
5	Gaza	2839318	2107154	2839318	2107154	2421797	3023389	3023389	3372741	3044348	3336870	2701375	2701375	33518228
6	Wadi Gaza	10920	11920	13920	13920	15020	17660	10880	14720	13000	13000	13000	13000	160960
7	Al Moghrakah	37530	39980	31500	63530	59380	59210	87480	67990	72500	86150	67990	67990	741230
8	Al Zahra	28850	23608	26760	38150	40760	45470	46850	40660	44000	43100	33720	31620	443548
9	Al Nussirate	310760	266540	254800	315030	367570	364406	413301	449139	373084	364320	364320	364320	4207590
10	Al Buriej	91850	108395	116696	122506	119205	144980	150335	92980	123185	123385	123385	123385	1440287
11	Al Maghazi	116067	92429	102466	121583	121379	136041	146661	131708	121697	128361	103582	104590	1426564
12	Al Zawiada	72833	78941	82759	105970	115563	118558	118558	85170	90000	90000	90000	90000	1138352
13	Al Musader	10920	11920	13920	13920	15020	17660	10880	14720	13000	13000	13000	13000	160960
14	Deir Al Balah	322137	315952	298945	414893	423647	408114	437694	422044	444590	439953	439953	439953	4807875
15	Al Qarara	77405	66502	78707	81722	81790	84215	94960	81790	81790	81790	81790	81790	974251
16	KhanYounis	696669	618952	598646	712329	770714	787577	845463	800000	800000	750000	750000	750000	8880350
17	Bani Suhaila	121564	119260	133013	182080	195010	156840	155510	183450	158930	143740	130190	130190	1809777
18	Abassan Al Kabira	72050	71320	64910	110870	114590	118890	110450	118020	118020	109200	121350	91840	1221510
19	Abassan Al Jadidah	25430	34170	26000	35160	38000	36000	36350	36100	36100	30680	30630	35770	400390
20	Kheza'a	32320	33490	30270	52910	51620	40330	55290	63480	63480	47390	36260	35030	541870
21	Al Fukhari	21300	17240	17175	28525	31145	31195	35635	39735	33025	34140	22050	20460	331625
22	Al Nasser	26460	20630	20630	23350	26000	25760	31010	42300	37370	35150	39960	26920	355540
23	Al Shokah	40546	43240	63390	67650	66070	66150	66150	66150	66150	66156	62330	62295	736277
24	Rafah	613000	564238	549496	628095	637192	657539	733187	701025	745537	725140	631254	651541	7837244
Total m3		7327257	6258081	7105507	7159046	7573993	8251866	8496030	9031998	8458370	8603988	7723194	7707910	93699252



Fig (5) Monthly water disinfection Efficiency –Year 2012

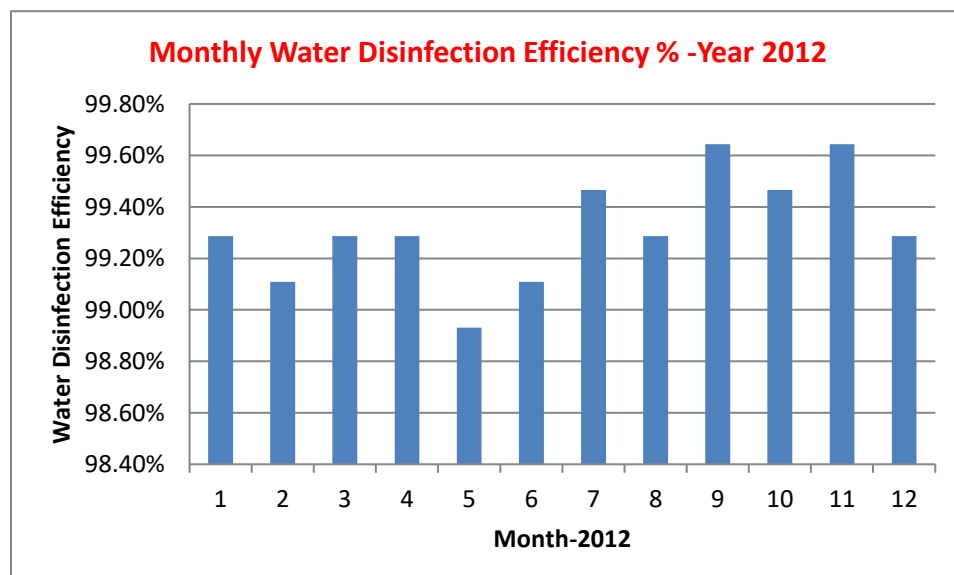


Table No.(2) Water Disinfection Monitoring Program

Sodium Hypochlorite Injection & Dosing Rate at Water Well Exit				
No.	Month -2012	Monthly Water Production (m³)	Monthly Chlorine Delivery (m³)	Chlorine Dosing Rate mg/liter
1	January	7327257	69	1.1
2	February	6258081	55	1.1
3	March	7105507	69	1.2
4	April	7159046	61	1.0
5	May	7573993	64	1.0
6	June	8251866	61	0.9
7	July	8496030	78	1.1
8	August	9031998	60	0.8
9	September	8458370	70	1.0
10	October	8603988	77	1.1
11	November	7723194	71	1.1
12	December	7707910	65	1.0
Average Dosing Rate		93697240	800	1.0

- c) Issue periodic reports of water disinfection efficiency related to the water distribution networks and production exits.
- d) Carry out periodic and field testing of the microbiological content for the new water networks and follow up any emergency testing requirements during emergency events and any risk of contamination which may occur throughout various working site.
- e) Supply of water chemical testing materials and equipments for ongoing water wells testing and quality monitoring program.
- f) Supply laboratory testing equipments and chemicals required to carry out various tests and monitoring programs.

2.1.5 Establishment and opening of CMWU Central Water Lab

During the last period, CMWU and in co-operation with UNDP and with generous fund of US\$ 500,000 from Austrian government has succeeded to establish and operate CMWU central lab located at Deir Al Balah sea water desalination plant. The new well equipped laboratory in addition to microbiological and chemical testing abilities for water and wastewater, it includes for the first testing equipment (ICP) in Gaza strip which shall facilitate the monitoring and testing program of heavy metals in water and wastewater.

The laboratory was inaugurated on 19th June 2011, and training program for CMWU staff in charge has been initiated and carried out by the consultant and the supplier of laboratory and equipments.



Fig (6) - CMWU Central Laboratory –Deir Al Balah

Moreover, several testing and quality monitoring programs have been initiated and launched to local consultant to produce well designed programs for both water and wastewater quality aspects.

2.2 New Water Resource

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. Desalination of seawater and/or brackish water is one of the proposed solutions to relieve the stress on the groundwater but due to large investment requirements to develop such plant which is not available at this time since it needs a stable political and economical situation. Henceforth, CMWU in cooperation with PWA throughout the recent study will attract funds to construct three moderate desalination plants with the capacity of 13 MCM as short term low volume program .Also, as emergency interventions CMWU constructed small scale brackish desalination plants to deliver acceptable drinking water quality in areas that already suffer from water shortage and deteriorated water quality with high salinity.

CMWU has continued to manage, upgrade, rehabilitate and monitor desalination plants from different donation which were constructed in several areas where the groundwater quality is not acceptable for distribution aiming at providing adequate water service for areas that are used to be deprived of water supply system.

CMWU has constructed new brackish water desalination plant at Al Nussirate area (Taj Al Waqar water well) funded by INTERPAL . The project includes supply and installation well head brackish water desalination plant of total production capacity 30m³/hour desalinated water. Also, 50m³/hr well head brackish desalination plant funded by Unicef shall be installed at Al Forqan water well in Al Nussirate area .



Fig (7)- Taj Al Waqar Water Desalination Plant – Al Nussirate

CMWU has constructed a new brackish water desalination plant at Rafah area. The project included drilling of new water well or productivity of 75 cubic meter / hour and 100 cubic meter concrete blinding tank .This project was financed by OXFAM.



Fig (8) Al Salam Brackish Water Desalination Plant - Rafah

2000m³/Day sea water desalination module with all associates funded by GCC/IDB has been contracted and the works have been commenced early October 2012 at Middle area sea water desalination plant to serve both Al zawaida and Deir Al Balah municipalities through blending water reservoir.

2.2.1 Mechanical Repairs Progress

During the period of this report from January to December 2012, several mechanical refurbishment repairs, and upgrading works and installations have been continued to be carried out at various operating water sites .Purpose has been applied to keep the existing and the new water installations functioning well and improve the level of reactivity towards some operational constraints such as unreliable power supply and shortages of spare parts and fuel supplies.

In addition to the regular continuous repairs and maintenance works the following major upgrading works have been provided and completed:

1. Supply and install 4 containerized brackish water desalination plants each of 50m³/Day capacity funded by Unicef at various water wells in Middle area ,KHanyounis and Rafah
2. Follow up the implementation of 50m³/hr well head brackish water desalination project at Al Forqan water well in Al Nussirate funded by UNICEF.
3. Replacement of 10 deep well vertical turbines in water wells of Khanyounis and Rafah in order to improve energy consumption and pumps efficiencies.
4. Completion of new installation of water booster station comprising of three pumps with all associated electromechanical installations at Saudi water reservoir of Rafah.
5. Carry out all mechanical and electrical installation required to provide Al Siyafa well in service mode in Beit Lahia.



Fig (9) - Rehabilitation of elevated water tank in Khanyounis – Saada Desal. Plant

6. Continue to manage and monitor the supply and distribution of programmed diesel fuel supplies to various standby power supply generators located at water wells ,desalination and pumping facilities funded by GCC/IDB ,UNRWA, UNICEF,OCHA(HRF) and other donors .This task has become one of the life supporting systems in Gaza strip which are essentially required to support water sector during harsh conditions of unreliable electricity supplies in Gaza strip from grid lines .Therefore it has crucially become needed to operate standby generators and to safe guard satisfactory water supplies to the people in Gaza strip .During the period of this report 800,000 liters of diesel fuel were supplied and distributed as shown on the following tabulated data :

Table No. (3) Monthly diesel fuel supplies from January to December 2012

No.	Month -Year	Fuel Delivery (Liter)
1	Jan-12	125000
2	Feb-12	125000
3	Mar-12	108744
4	Apr-12	41254
5	May-12	58277
6	Jun-12	36327
7	Jul-12	77948
8	Aug-12	38386
9	Sep-12	40914
10	Oct-12	1000
11	Nov-12	111211
12	Dec-12	100000
Total (liter)		864061

**Fig (10) - Fuel supply and distribution**

7. Carry 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.

2.2.2 Electrical Works Progress

During the period of this report several electrical repairs and upgrading activities were applied and carried out as follows:

1. Continue to manage and follow up remote monitoring program initiated for specific water wells in Rafah and Khanyounis. The system will enhance and improve the operation and maintenance activities for different water and wastewater facilities and eliminate the human intervention. Also, all operational data and faults records shall

be remotely provided by the system down to the designated control room at CMWU regional and HQ offices.

2. Continue to carry out technical review and provide electrical design for new projects whether it is implemented now or proposed to be carried out in the future e.g. booster stations, reservoirs, wells lifting stations.
3. Continue to review electrical shop drawings and review as built drawings for electrical installations of all new projects managed and carried out by CMWU along with all Gaza strip governorates.



Fig (11) - Repair of high pressure pump- Khanyounis RO desalination plant

2.2.3 Computerized Maintenance Management System CMMS

CMWU by its own resources has took the initiative to produce its modified version of CMMS software required to manage and drive all maintenance programs with different activities for water , wastewater and vehicles facilities.

The soft ware modules have been completed and installed for demonstration at Rafah regional area which will improve maintainability and serviceability levels for different equipments and systems .The new soft ware will efficiently deal with scheduled and unscheduled job orders for maintenance and enhance the implementation of preventive maintenance needs as per manufacturer's recommendations.

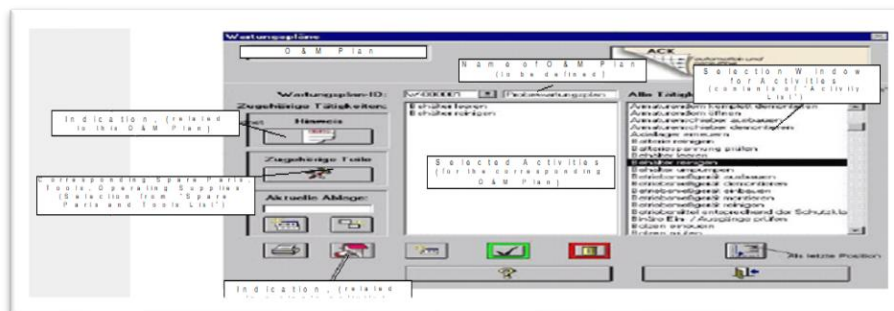


Fig (12) -CMMS screen shot

2.3 Water Networks and Reservoirs

This section handles water network plans, upgrading, rehabilitation activities, water tanks activities and water booster pump stations activities.



Fig (13) - Water Reservoir in Jabalia

1. Completed Construction of Water Carrier for Jabalia Water Tank, the project is financed by Islamic Relief
2. Completed Rehabilitation of Water Network in Rafah, Khan Younis and Beit Lahia, the project also financed by Islamic Relief .
3. Completed Installation of two main pipelines for two areas in Khanyounis, the project is financed by ANERA.
4. Completed Rehabilitation of Water Networks at Eastern area of Jabalia , the project is financed by GCC/IDB
5. Completed Rehabilitation of Water Networks at (Dair El Balah Camp and Bani Suhila) the project is financed by GCC/IDB
6. Completed “Construction of Tal Al Sultan Water Tank-Rafah” the project is financed by UNDP.
7. Completed Construction of water storage tank and water booster pumping stations in Khanyounis with capacity of 5000 cubic meter. The project is financed by ANERA
8. Completed “ Construction of Water network at Khan Younis and Rafah Area” the project is financed by PHG
9. Completed Rehabilitation of Water Networks at the middle area of Gaza Strip , this project is financed by GCC/IDB
10. Completed Rehabilitation of Water Networks at Beit lahia , this project is financed by ANERA
11. Completed Rehabilitation of Water Networks at Khan Younis , this project is financed by ANERA
12. Completed Rehabilitation of Water Networks at Beit Hanoun , this project is financed by GCC/IDB
13. In progress Rehabilitation of Water Networks at (Khan Younis and Rafah Governorates), this project is financed by GCC/IDB.

14. In progress “ Construction of Water Tank 3000 m3 and Pumping station in Al Moghraka “ this project is financed by GCC/IDB.
15. In Progress “ Construction of Water Tank 4000 m3 at Bani Suhaila the project is financed by GCC/IDB.
16. In progress “Construction of Water Tank 4000 m3 at Dair El Balah the project is financed by GCC/IDB.
17. In Progress “ Construction of Water Carrier lines and Distribution Networks at Al Moghraka Area, the project is financed by GCC/IDB.
18. In Progress “ Rehabilitation of Water Networks at Rafah, the project is financed by GCC/IDB.
19. In Progress “ Construction of Water Networks at Al Nussairat, the project is financed by Islamic Relief.
20. Consulting Services for Design of major water supply projects. CS 01-07/2011-WB-AFIII which includes detail design of water tanks, pumping station and water and wastewater networks in Deir El Balah and Khan younis governorates.
21. Preparing the TOR of new consultancy service: Consultancy Services for Calibration of Water Supply System Models for Rafah and Deir El Balah.
22. Complete the adopted general technical specifications have been reviewed, compiled and classified into the following sections:
 - General provisions.
 - Earth works.
 - Concrete works
 - Piping works
 - Finishing works
 - Electrical works
 - Pumping stations
 - Desalination plants
23. Cooperation and assistance of other ministries:
 - Ministry of public works in designing water networks including detail drawings and BOQ for new housing projects (Al Boraq and Esra’a – KhanYounis, and Beisan – North)
 - Cooperation with consultants in the detail design of water and wastewater of main roads in Gaza Strip.
 - Cooperation with ministry of planning in preparing the annual operational plan 2012.

2.4 Waste Water Treatment Plants

There are three main waste water treatment plants located in Beit Lahia, Gaza and Rafah areas as well as two intermediate treatment plants in Khan Younis (Mawasi area) and under construction Wadi Gaza WWTP. This section will be divided into four main activities components based on treatment plants location as follows:

2.4.1 Beit Lahia WWTP:

The following activities take place at BLWWTP:

Proposal to clean the ponds no. 1 and 2 of BLWWTP was raised to PAH in order to increase the capacity and raise the treatment efficiency of the plant and the proposal was approved in December 2012 and the agreement will be signed at the beginning of 2013

2.4.2 Gaza Central Sewerage Project (KFW Donation):

A) KFW has allocated 70 million Euros for the construction of Gaza Central Wastewater treatment plant. This project consists of the following components:

1. *Construction of the new El- Bureij Wastewater treatment Plant*
2. *Wadi Gaza Central Sewage Pumping Station*
3. *Construction of 3700 meters long pressure main*
4. *Construction of 5400 meters long gravity trunk line.*

Due to the political situation in Gaza Strip, the project has been frozen. Alternatively, and as an emergency requirement, it has been agreed with the KFW that the CMWU will prepare a proposal to upgrade GWWTP to serve Gaza city for the next five years. This proposal has been accepted by the KFW and part of the Central WWTP fund was allocated to finance the Emergency Sewage Works in Gaza City. The hired consultant by KFW has finalized the detailed upgrading designs for GWWTP extension and other related components such as upgrading PS1, and constructing the pressure line of diameter 600 mm with total length 4500 meters.

Two contracts were signed with Masoud and Ali Contracting Company (MACC) in order to start upgrading GWWTP

- The contract No. 1 had been signed between CMWU and Masoud and Ali Contracting Company (MACC). The contractor had succeeded to enter the materials and this contract is totally completed and all materials were handed over to CMWU/MOG.
- The contract No. 2 (civil works) had been signed between CMWU and MACC whereas the contractor almost finishes the construction works.



Fig (14) - Gaza Wastewater Treatment Plant

B) Supply and install a complete new Flygt type wastewater pump at Gaza sewage pumping station No. 1, Al Montada Model 3231/735-5159 of hydraulic capacity 800m³/hr at a total head of 53m which was funded by UNICEF .The pump has replaced the deteriorated pump at the station and **reduced the risk of flooding towards Gaza beach**. The following activities have been completed in this project:

1. Completion of all works at the pump station (Pump station No. 1), and the pump station is under operation.
2. 100% completion sludge drying beds at East Bureij and 75% of sludge drying beds at the treatment plant site.
3. Completion of the two sludge holding ponds at the treatment plant.
4. Completion of 100% of laying the 500 mm ductile Iron pipe from pump station 2 to pump station 1.
5. Completion of 100% the 600 mm DI pipe line from pump station 1 to the treatment plant.
6. Completion of all works at the treatment plant, it is under testing and commissioning.

2.4.3 Wastewater Activities in Rafah and Khan Younis Governorates

2.4.3.1 The following activities take place in Rafah-WWTP:

1. A complete monitoring plan for Rafah and Khan Younis wastewater treatment plants have started since June 2011; the work has included all the biological analysis for the wastewater before and after each element of treatment plant.
2. Works to install the sand classifier at RWWTP is considered at the new project of operation and commissioning.

3. Completed of phase two of operation and commissioning of RWWTP the work included construction of two monitoring wells and one recovery well, in addition to the equipments needed to run the monitoring activities.
4. A proposal to clean the ponds no. 1 and 2 of RWWTP was submitted to PAH in order to increase the capacity and raise the treatment efficiency of the plant and the proposal was approved in December 2012 and the agreement will be signed at the beginning of 2013

2.4.3.2 The Following Activities take place at KHWWT:

Most of Khan Younis WWTP upgrading phase has been completed during 2012, this upgrading works have been carried out in order to increase the system efficiency and to be compatible with the additional quantity of WW flow 12,000 M3/Day

The following are the main activities.

1. Construction of new inlet structure fine bar screen and grit removal.
2. Installing venture meter at the inlet.
3. Increasing number of aerators at the aerated lagoons in order to increase the system treatment efficiency
4. The second anaerobic lagoon was converted to completely mixing aerated lagoon by adding new six aerators.
5. Lagoon No.4 was divided for two lagoons 4A & 4B one for settling and the second for polishing.
6. Repairing the polyethylene sheets for the ponds to prevent WW seepage.
7. Re- locating and laying the pipes inside the plant in addition to laying bypass pipes to facilitate cleaning the ponds and maintenance works.
8. Cleaning the ponds from the accumulative sludge and removing it to dumping site after de-watering.
9. Planting trees around the external fence in order to reduce sand accumulation in the ponds.



Fig (15) - KH Wastewater Treatment Plant

2.4.4 Wastewater Activities in Middle Area Governorate

The following activities took place in the Middle area:

1. A baseline study has been completed for the existing situation of the wadi Gaza and has been discussed with all the concerned Authorities.
2. Completed EIA study and concept design for the intermediate wastewater treatment plant at Wadi Gaza.
3. Starting implementation phase of Wadi Gaza Wastewater treatment plant, this project includes two components (Wadi Gaza WWTP and the pressure line from UNRWA pumping station to the plant with 2700 meter length) the project is financed by ICRC.

The main objectives of construction of waste water treatment plant (WWTP) in Wadi Gaza are:

- A. Drying Wadi Gaza from the raw wastewater streams running over 5 km along the Wadi course and causing serious environmental pollution and public health hazards. Drying the Wadi will be achieved by directing all the raw wastewater streams to the temporary WWTP.
- B. Treating the collected wastewater to a quality suitable for safe disposal to the sea. This will protect the marine environment and keep it suitable for fishing and recreational purposes. Treating the wastewater for irrigation reuse was excluded since it requires higher treatment technologies and higher investment costs that are not justified for a temporary situation.

Project Main Activities

consisting of Pipelines, Energy breaker, Mechanical and Manual Bar screens, anaerobic lagoon, Aerobic lagoon , Polishing pond, outfall to the sea, all protection to the embankment to prevent from seasonal flooding, all the electrical works including connection to existing network and connection fees, transformer if needed, Electrical

generator, Fuel tank and containment, Guard room and electrical room, outfall pipe and structure to the sea and all necessary external works and un mentioned items which is necessary to make the treatment operational to give the quality of effluent as the following requirement:

Quality Parameter	Disposal to the sea
BOD 5 (mgO ₂ /L)	60
COD (mgO ₂ /L)	200
TSS (mg/L)	60
Fecal Coliform(No./100ml)	50,000

Starting construction of the second component of Wadi Gaza project" Sewage Pressure line from UNRWA Sewage pumping station to Wadi Gaza WWTP, also this project is financed by ICRC.

2.5 Storm Water Activities

1. Completed Construction of storm water network, storm water pond upgrading Al Jeniena pump station- Rafah, this project was financed by TIKa and during 2012 protection fence around Al Jenuna stormwater ponds has been installed.
2. Completed "construction of storm water and wastewater network in Khan Younis", this project financed by QRC.

Fig (16) - Construction of Storm water pond and storm water networks at Rafah Area



2.6 Waste Water Pump stations and networks:

This section handle expand, repair and maintenance of all waste water network activities as;

1. Completed” Upgrading and Maintenance of Beit Hanoun sewage pump stations lot (1), this project was financed by ICRC.
2. Completed” Construction of Al Berka wastewater pumping station-Dair El Balah” the project was financed by TIKa.



Fig (17) Al Berka WW pump station- Dair Al Balah

CMWU is now in the process of

1. Upgrading of Al Hawaber pump station and construction of pressure pipeline from Hawaber pump station to the treatment plant at the Northern Area, the project is financed by ICRC.



Fig (18) – Construction of Al Hawaber Sewage P.L

2. Completed “Construction of Wastewater Network through Gaza Strip” the project was financed by GCC/IDB.
3. Completed “Construction of Wastewater Networks and House connections at Rafah Governorate” the project was financed by UNICEF
4. Completed “Construction of Wastewater Networks at Rafah Municipal area” the project was financed by UNICEF
5. Completed “Construction of Wastewater Networks at Beit Hanoun” the project was financed by Save the children.
6. Completed “Construction of Wastewater Pumping Station and WW Networks at Bani Suhaila” the project was financed by OXFAM
7. In progress “Construction of Wastewater Networks at Jamal Abed Al Nasser St. At Khan Younis” this project is financed by ANERA.
8. Completed “Construction of UPVC 450 mm gravity sewage line at Beit Hanoun, this project was financed by save the children.
9. In progress “Construction of Wastewater Networks at Al Kateba area. -Khan Younis” this project is financed by ANERA.



Fig (19) – Bani Suhaila P.S



Fig (20) WW Networks at Rafah-UNICEF

2.7 Electromechanical Services - Waste Water Pumping and treatment Facilities.

During the period of this report ,several electromechanical maintenance and repair services listed here below have been carried out to safe guard the systems and reduce the possibilities of breakdown events:

1. Procure and install of six surface aerators for Beit Lahia wastewater lagoons
2. Construction of 60 square meters service building at Abo Rashid Waste Water pumping station
3. Procurement of jetting hoses crimping machine.
4. Maintenance of bar screens of Abo Rashid, Al Alami and Mahader
5. Complete upgrading of Al Alami and Mahader PS, the work included construction of service buildings.
6. Construct a complete secondary pumping station in north lagoons as replacement of Al Qus ps
7. Replacement of Galvanized Steel wet pit covers with stainless steel ones with better design to get rid of accumulation of toxic gases.
8. Maintenance of sluice gates, gate valves, check valves and electrical hoist cranes in all Ps in Jabalia and B. Lahia
9. Carry out 37 electrical repair jobs at different sites e.g. programming PLC, replacement of soft starters, re-connections and cabling and repairs of controls.
10. Complete all technical follow up of all electromechanical services and systems for the new wastewater projects and facilities – e.g. Hawaber pumping station in Jabalia, Sultan Abdel Hamid pumping station and main pumping station in Beit Hanoon.etc.
11. Follow up systems malfunctioning events with the contractor during one year defects liability period and assuring the repairs and rectification to be carried out in accordance with requirements and manufacturer's recommendations for Rafah WWTP funded by ICRC.
12. Complete repairing and maintenance contract for wastewater vehicles funded by QRC
13. Complete the supply contract for wastewater aerators equipment funded by QRC .The tender was opened and passed towards evaluation stage.
14. Follow up, supervise implementation project for upgrading and rehabilitation of wastewater pumping stations through out Gaza strip governorate funded by QRC as follow:
 - Complete maintenance of Tofah mini pumping station (Speroni) –Khanyounis
 - Complete overhauling of 3300-181 Flygt pumping unit of Basa Pumping station , the malfunction is mainly due to sand accumulation
 - Mechanical overhauling and repair in the manifold of new camp pumping station of NUSIRAT.
 - Maintenance and cleaning and Repair of Beit Hanoon Main PS manifold.

- Following up the cleaning and the blowing of infiltration basins at the north of Beit Lahia.
- The gears of the two bar screens of pumping stations Wafia and Hesbet Al samak were replaced and both are functioning well-Khanyounis.

3.0 PROGRAM ACTIVITIES PROGRESS

This section will deal with the utility administrative

3.1 Geographic Information System (GIS)

Through GIS department at CMWU and by UNICEF donation, CMWU could accomplish surveying all waste water manholes in all of Rafah and Khan Younis cities and the related maps have been updated based on the actual field survey. The collected data were incorporate into the GIS system.

A new GIS web site has been created to show the different area maps with its live demonstration for the current infrastructure in the different areas. Application for this purpose is being implemented and secured as well by login permission. This web site can be access as <http://gis.cmwu.net>. By this achievement anyone through the world web internet can view the data in case permission is secured.

3.2 Customer Services

In this period, lots of activities were running to enhance the customer services program as follows;

1. Follow up the operation and maintenance of comprehensive customer information and Service system CCISS at 14 different municipalities in Gaza Strip in total coordination with CMWU IT section.
2. CMWU continue issuing the water bill in a monthly basis for 14 municipalities in Gaza Strip region. The number of customers served by the 3 regional offices (Rafah, Khanyuins and Der El Balah) is 47,403 customers.
3. The efforts to increase collection efficiency especially in Rafah Area continued through different cooperation with legal and local institutes, but the bad economical situation mainly the financial crisis that the Palestinian government passes through affect these efforts drastically.
4. The customer services department prepares a proposal for Tariff change in the area of Rafah. In cooperation with the technical directorate, the department manages to have updated figures regarding the cubic meter cost for water and using this information the new Tariff proposal is developed. The CMWU is now in the process to get the necessary approval before starting the application.
5. A letter was sent to minster of local government to invite the head of the main municipalities in Gaza Strip in order to form a pressure group directing the government to take necessary actions in order to enhance the ability of the municipalities and the

CMWU to collect the water bills due amounts. This can be done through issuing the necessary legislations that will help in raising the monthly collection ratio.

6. Follow up the progress of the bill improvement collection campaigns firstly issued in April 2009 in Rafah area. The collection figures were encouraging and meet the campaign expectation. The collection ratio has raised from 25% in 2008, to 44% in 2009, 48% in 2010, 58.50% in 2011, but finally and due to different circumstances (financial crisis with the Palestinian government which delay the disbursement of employees salaries several times during the year in addition to the war on Gaza in November along with the general bad economical situation, unfortunately the collection ratio decrease to 46.0% in 2012.
7. The efforts to increase collection efficiency includes the followings;
 - Rewards Campaign for the committed customers.
 - Legal follow up campaign for uncommitted customers.
 - Door to Door Campaign to collect the monthly bill at customers door step.
 - Hiring past experienced employees to collect the bill from totally uncommitted customers.
 - Sign an agreement with municipalities police to help in collecting the due amounts form the uncommitted customers.
8. The Participation in public awareness campaign funded by UNICEF in order to spread the culture of water saving among the residents in Southern and Middle area of Gaza Strip.

3.3 Vehicle Maintenance

During this period, CMWU keeps maintaining all water and wastewater vehicles for the operation purposes despite the scarcity of spare parts and the bad quality of fuel in the market through a service contract funded by QRC for the following works categories and the records show that 10 major repair and maintenance jobs have been carried out:

1. Mechanical repair and maintenance of wastewater jetting and tankering equipments including the repair of tanks and motor overhauling and pumps replacement.
2. Mechanical overhauling of vehicle motors.
3. Body repairs and painting works.
4. Arrange for all preventive maintenance spare parts and materials e.g. lubricants oil, grease, batteries, tyres...etc
5. Replacement of jetting pumps.
6. Mechanical repairs and overhauling of excavators JCP.

4.0 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;

4.1 Enhance the identity of the CMWU as a fully functional service provider:

1. Following up the new CMWU structure for the head quarter and regional offices for better performance.
2. Expand the CMWU works in other areas in order to cover all Gaza Strip Governorates.
3. Enhance the interface management between CMWU and PWA
4. Form the coordination committee with Municipality of Gaza in order to implement the Gaza sewerage Emergency Project financed by KFW.
5. The consultant finalized and submitted to CMWU the strategic plan for the coming five years.

4.2 CMWU Headquarters:

4.2.1 Construction of Water & Wastewater Lab.

During the last year the CMWU has constructed the Water & WW central lab. In Al Zahra city, the building of the lab has been completed and the lab equipments have been supplied this project is financed by GCC/ISDB

Finishing works for the lab now is ongoing and once finishing works completed the supplied equipments will be installed and the lab will be in operation in order to manage and monitor the quality for water & WW. The Building will be the CMWU headquarters .



Fig (21) Water & WW lab.

4.2.2 Construction of CMWU Maintenance Workshop and Warehouse.

The CMWU as a service provider is looking for supplying materials (pipes, pumps, fittings, meters.....) required for emergency cases and in maintenance of water & WW facilities through Gaza strip whereas those materials should be stored in a suitable place to keep them in a good situation. In addition to that there is a need to specify place for maintenance workshop where maintenance and fixing the (pumps, vehicles, jetters, valves....) take place, Consequently the CMWU during the last year has succeeded to obtain the fund from ISDB to construct this maintenance workshop and warehouse, this project is under construction now.

4.3 Follow up the World Bank Activities:

The main financing agency to the CMWU operation and maintenance activities is the World Bank, through which we are looking to achieve the following;

1. Keep managing the implementation of the performance indicators since they are very important to keep the functionality of the utility.
2. Coordinate among the different departments of head quarter and the Regional offices to improve the performance indicators; especially the collection system and treatment efficiencies.
3. Plan for projects in coherence with the strategic plan.
4. Activate the new parallel financed project between the World Bank and the ISDB with a budget 17.54 MUSD "Gaza Water Supply and Sewage System Improvement Project". The project development objective is to improve the quality and efficiency of water supply service provision in Gaza via (i) rehabilitation and expansion of water supply networks and facilities and (ii) building the capacity of the Palestinian Water Authority (PWA) in Gaza and the Coastal Municipalities Water Utility (CMWU).

4.4 Public awareness campaigns:

Advocacy and Public Awareness campaign implemented during last year (2012) relied on the methodology of raising the public awareness of water and sanitation in the Gaza Strip and concentrated on the following issues:

- Saving water
- Cleaning tanks
- Water pollutants
- Water situation

However, Building the capacity of the activists in the field of water and sanitation, that targeted different groups; youth (males, females), women, farmers and children.

Parts of the implemented activities are mentioned here below for instant:

1. Training courses: Media & awareness unit implemented 2 training courses, which targeted 54 trainees from all over Gaza Strip.
2. Workshops: Media & awareness unit implemented 36 workshops in all the 5 Gaza governorates.
3. Producing a play of the water issues: Media & awareness unit implemented 20 shows of "Noqtet Nazam Play" in different areas of Gaza Strip, the play displayed the water issues including groundwater pollution, tank clearing, and negative behaviors of water consumption, drinking polluted water and other related topics.
4. T.V. Ad: Designing one T.V. Advertisement (video clip), which highlights the importance of the water and its issues.
5. Radio Awareness Episodes: broadcasting 12 radio awareness episodes.
6. Children Program; in the World Water Day, at Al Qattan Center.
7. Media Materials including; 4 different stickers, 2 posters, 2 brochures, coloring books for children, billboards and 1 manual.
8. Ceremonies: 4 closing ceremonies, 7 opening projects ceremonies, and 1 World water Day ceremony.



4.5 Coordinate with other entities:

As known since the establishment of CMWU, all the projects for either development or for emergency are funded from different donor agencies until CMWU could stand alone for its facilities operation and maintenance as well as developmental projects. This is expected to take more than 5 years at least. The following are the activities which will take place in cooperation with other donors' agencies as;

1. **ISDB:** an agreement signed with ISDB, UNDP, PWA and CMWU to construct the Central Wastewater Treatment Plant At Khan Younis. GCC/ISDB during 2012 has financed 5 packages of projects for improving and rehabilitation of Water & WW sector at Gaza Strip also, new projects will be implemented during 2013 by ISDB fund.
2. **UNICEF:** an agreement signed with EU, PWA, and CMWU to construct a sea water desalination plant between Rafah and Khanyoounis with capacity 6000 m³/day , in addition to a new agreement signed between UNICEF and CMWU to rehabilitate water & wastewater networks at different locations in the southern area.
3. **ICRC:** During the last 2 years 2011/2012 ICRC has financed different projects which aim to improve especially the wastewater sector at different areas of Gaza strip of a total budget reaches 5 MUSD. In addition to that ICRC has financed many new projects which will be implemented till year 2014.
4. **UNRWA:** Coordinate with UNRWA in order to complete the two uncompleted projects: (a) The Tal Sultan Sewage P S is now in operational mode, (b) Sewage Pressure carrier line in Khanyounis (negotiation stage).
5. **QRC:** has financed different projects to be implemented through 2012 including electromechanical upgrading and maintenance for water wells and WW pump stations.
6. **Oxfam:** during the last year OXFAM has financed Construction of Al Salam Water Desalination plant, in addition to Construction of Bani Suhaila Sewage Pumping Station and WW networks project.
7. **TIKA:** All the projects funded by TIKA have been completed during the last year 2012,
8. **UNDP:** Follow up implementation of Beit Hanon Water supply projects which started on October 2012, the project divided into four components as follow:
 - Construction of water tank with Capacities of 4000m³ in the west part of Beit Hanoun.
 - Construction of water tank with Capacities of 3000m³ in the east part of Beit Hanoun.
 - Re-Configuration works for the existing water wells.
 - Construction of Distribution water networks

Total budget of those components is 2.5M USD.

9. **Save the children:** in cooperation with CMWU save children during 2012 completed rehabilitation/ maintenance the wastewater networks in Jabalia , in addition to fixing and construction new fences for storm water ponds at Al Saftwai area in Jabalia during the children' protection program.
10. **Other Ngo's:** CMWU is keeping communication with all NGO's that are working in the water sector in order to work within master plans and its defined targets.

4.6 Classification And Codification Of CMWU Stores Materials

The CMWU start the test of new computerized Financial and Administration Management system. Part of this system will be Materials management including the Central and regional warehouses.

In order to solve many problems in the current warehouse management system, it was necessary to adopt a good and efficient Classification and codification system for CMWU stores materials. A comprehensive manual for Classification and codification of material has been prepared. 100% of CMWU stores materials have been given a unique code and descriptive name. New supplied materials will be systematically incorporated into the system.

1. Inventory of all CMWU assets including: wells, pumping stations, R.O plants, wastewater treatments plants, etc.
2. Setting up coding system for the CMWU assets.
3. Inventory of cars, IT products, furniture and stationary in the CMWU central and regional offices and setting up coding system and incorporating data in the computer database.

5.0 Main Obstacles

One of the main and major obstacles towards accomplishing on going contracts are the siege forced on the Gaza commercial borders towards importing the necessary goods to finish the works. Added to that; the cost of materials which becomes higher than its regular price due to difficulties in obtaining those materials to implement the projects. Some of the contractors have succeeded to import their materials with higher prices in which affect the engineering estimation for the projects' supply materials.

Due to Gaza Strip situation, some of the developmental projects are not financed and some of the water and waste water projects become humanitarian projects.

During the period of this report, Gaza strip was suffering from catastrophic shortages and unreliability of electricity power supply which 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 some how

harmfully affected with long term operating schemes to keep and protect the services provided to the people of Gaza .

In addition for all these obstacles the last offensive on Gaza Strip causes many damages and adds new challenges to continuo supplying water and wastewater services.

6.0 War 2012

On 14 November 2012 at about 4 pm o'clock in the evening, the Israeli aircrafts started shelling Gaza Strip from the air, and the military Israeli boats were shelling Gaza Strip coast all over the shore line, afterwards the Israeli tanks started shelling the Gaza Strip from different locations. The war has lasted for 8 days, and then the cease fire was on 21 November 2012.

After the cease fire declaration, several technical and administrative teams have been formed by CMWU to carry out detailed physical, technical and environmental survey to assess various damages occurred during the period of Israeli Military Offensive in the Gaza Strip for water and wastewater infrastructure and facilities.

Damages Assessment

Based on the field survey by the CMWU teams during and after the Israeli Military Offensive war on the Gaza Strip, a total direct damages estimates reaches up to 595,000 USD and it will become more since every day there are some new damages found in some areas of the Gaza Strip which still under construction debris.

Damages Type	Estimated Cost USD\$
Water wells	20,000
Water Network Distribution	20,000
Waste water Network Distribution	10,000
Waste water Facilities	30,000
Water Tanks	400,000
Expected Un seen Damages were the vibration bombs used may destroyed the nearby networks and facilities.	100,000
Civil Work, Equipment and Material Damages	5,000
Contingency	10,000
Total USD \$	595,000

7.0 Conclusion

Due to over abstraction from the aquifer, the ground water became saline as a result of the seawater phenomena. Therefore, CMWU in cooperation with PWA have been looking for financing large projects especially large scale 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 is working hard to market itself locally in a way to convince the two municipalities outside the CMWU frame to join CMWU in order to improve the water and waste water services for all over the Gaza Strip.

CMWU shall look for self dependency especially in 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 has been working jointly with the WB and IDB in order to support a new project which includes operational cost and developmental projects for the next 3 years until CMWU is able to stand alone.

END