



State of Palestine

Coastal Municipalities Water Utility



Bi-Annual Progress Report 2013

By

CMWU Management Team

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TABLE OF CONTENTS

ACKNOWLEDGEMENT	3
INTRODUCTION.....	4
1. IMPROVING QUALITY & QUANTITY OF WATER.....	5
1.1 Overall Water Distribution System Efficiency	5
1.1.1 Wells Construction Progress:.....	8
1.1.2 Electromechanical Progress	9
1.1.3 Water Wells Functionality Progress	11
1.1.4 Water Wells Energy Consumption	13
1.1.5 Water Quality Monitoring Progress	14
1.2 New Water Resource.....	21
1.2.1 Mechanical Repairs Progress	22
1.2.2 Electrical Works Progress	25
1.2.3 Computerized Maintenance Management System CMMS	26
1.3 Water Networks and Reservoirs.....	26
1.4 Waste Water Treatment Plants	27
1.4.1 Beit Lahia WWTP:	27
1.4.2 Gaza Central Sewerage Project:	27
1.4.3 Rafah Wastewater treatment plant (RWWTP)	29
1.4.4 Khanyounis Temporary Wastewater treatment plant (KhTWWTP)	29
1.4.5 Wastewater Activities in Middle Area Governorate (WGIWWTP)	29
1.5 Storm Water Activities.....	31
1.6 Waste Water Pump stations and networks	31
1.7 Electromechanical Services - Waste Water Pumping and treatment Facilities.	33
2.0 PROGRAM ACTIVITIES PROGRESS.....	34
2.1 Geographic Information System (GIS)	34
2.2 Environmental Management Plan (EMP).....	35
2.3 Customer Services.....	35
3.0 OTHER ACTIVITIES.....	36
3.1 Enhance the identity of the CMWU as a fully functional service provider:	36
3.2 CMWU New Assets:	36
3.2.1 Construction of Water & Wastewater Lab.....	36
3.2.2 Construction of CMWU Maintenance Workshop and Warehouse.	37
3.3 Donor's visits to the CMWU sites:.....	38
3.4 Follow up the World Bank Activities:.....	38
3.5 Public awareness campaigns:	39
3.6 Coordinate with other entities:.....	40
3.7 Classification and Codification of CMWU Stores Materials.....	41
4.0 Main Obstacles.....	41
5.0 Conclusion	42
Success Story.....	43

List of Tables

Table 1	Overall Biannual System Efficiencies
Table 2	Repair Jobs January – June 2013
Table 3	Supplied Chemicals January-June 2013
Table 4	Water Disinfection Monitoring Program
Table 5	Total Biannual Production (m ³) January-June 2013
Table 6	Repair Works for dosing pumps

List of Figures

Figure 1	Biannual System Efficiency 2013, Middle-South Areas
Figure 2	Drilling and Equipping of a Water Well
Figure 3	Generator in Al Shokah on line Booster Station
Figure 4	Water Meters Stocked at CMWU Stores
Figure 5	Functionality Percentage of All Areas
Figure 6	Specific Energy Consumption 2013
Figure 7	Monthly Water Disinfection Percentage 2013
Figure 8	Chlorine Dosing Unit
Figure 9	Monthly Water Disinfection Efficiency
Figure 10	Training Session – Water Disinfection and Chlorination
Figure 11	Taj Al Waqar Water Desalination Plant-Al Nussirate
Figure 12	Construction of Seawater Reservoir in Deir Al Balah RO Desalination Plant
Figure 13	Rehabilitation of Taj Al Waqar Water Well, Al Nussirate
Figure 14	Fuel Supply and Distribution
Figure 15	Electrical Control Switchboard
Figure 16	Repair of a High Pressure Pump
Figure 17	CMMS Screen Shot
Figure 18	Construction of Al-Moghraka Water Tank
Figure 19	Gaza Wastewater Treatment Plant
Figure 20	Khanyounis Wastewater Treatment Plant
Figure 21	Wadi Gaza Wastewater Treatment Plant
Figure 22	Construction of Al Hawaber Sewage P.L
Figure 23	Bani Suhaila Pumping Station
Figure 24	Wastewater Networks in Rafah
Figure 25	Installation of Mechanical Floating Aerator-BLWWTP
Figure 26	Water and Wastewater Lab
Figure 27	CMWU Main Workshop and Central Warehouse
Figure 28	IsDB visit to Al Moghraka Water Tank
Figure 29	CMWU Public Awareness Campaigns and Ceremonies

List of Annexes

Annex 1	Performance indicators
Annex 2	EMP procedures
Annex 3	Weekly reports
Annex 4	Procurement Plan
Annex 5	Financial report

ACKNOWLEDGEMENT

This bi-annual report has been prepared by the WSSSIP project management unit (PMU) teamwork in-cooperation with Coastal Municipalities Water Utility (CMWU) - operational team. The report is mainly composed of all relevant activities progress schemes implemented during the first half of year 2013 with special emphasis on the Parallel finance by WB & IsDB

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 continuous support in order to push this project and all other projects towards success.

Thanks also continue to the World Bank as a main funding agency for O&M activities and to the Islamic development Bank (IsDB) for the parallel finance program "Gaza Water Supply and Sewage System Improvement".

PMU and CMWU operational team would like to thank all other donors to their continuous support in financing water and waste water projects such as OCHA (HRF), ICRC, QRC, KFW, AFD, TRC, UNICEF, Paltel, 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.

INTRODUCTION

Throughout the first six months of WSSSIIP project, all efforts and activities have been directed in parallel towards implementing the essential required water and wastewater projects and managing set of operational and maintenance tasks which are playing great role to improve the level of services for the people in Gaza strip. Hence to achieve the following;

- a) Keep managing and monitoring the performance indicators since they are very important to keep the functionality of the utility.
- b) Coordinate among CMWU different departments of head quarter and the Regional offices to improve the performance indicators; especially the collection system and treatment efficiencies.
- c) Plan for projects in coherence with the strategic plan.

During the past 6 months from Jan. to June 2013, the Gaza Strip has been continued to be under IDF restrictions across the borders commercial gates except for minimum requirements of living and some selective materials for development projects. These restrictions and control over materials and equipment deliveries through the borders gates have caused several development strategies and plans to be in a noticeable delay and make all PWA and CMWU efforts 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 PMU / PWA & 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 PWA, 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,

PMU-PWA and CMWU teamwork continues to manage and implement various repair, refurbishment and overhauling works related to more than 205 water wells, 26 water Storage Tanks, 10 water desalination plants, 16 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 upgrading, maintenance and repair needs e.g. generators, deep well water pumping sets...etc.

The poor reliability of electrical power supply grid with overall deficit of about 40% connecting the water and wastewater facilities including water wells, pumping facilities and treatment works continues 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 construction and spare parts materials make it impossible in some how to do any upgrading or services improvement with this regard.

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. Also, strict accessibility controls have been applied by Israel

authorities against several types of essentially required materials and equipments to pass through the main commercial gates between Gaza and Israel.

Therefore it has become relatively so difficult to fulfil and complete other planned projects implementation programs in the due time.

TECHNICAL PROGRESS ACTIVITIES

This report describes the progress achieved during the period from January 2013 to the end of June 2013. 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.

1. IMPROVING QUALITY & QUANTITY OF WATER

*refer to Annex 1 for Performance Indicators Table

1.1 Overall Water Distribution System Efficiency

Throughout implementing the first year of WSSIP project PMU and CMWU has continued monitoring in order to improve the overall efficiency of the existing water distribution systems.

The 1st year target of 63% has been achieved in first six months. By the end of June 2013 the system efficiency has been progressively achieved its target demonstrating an acceptable performance and conclusion to this task.

Efforts to improve the overall system efficiency will continue to be made through to the end of 1st year. PMU and CMWU believe 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.

The improved management of data introduced by CMWU continues to be a valuable tool to monitor and report the overall system efficiency each month. Meter readings continue to be collected by the Municipality and regional areas staff. Although new data collection and verification procedures were introduced, some difficulties were experienced in the municipal reports; this required CMWU to perform additional verification crosschecking and refinement of the submitted figures.

The overall biannual system efficiencies recorded to date are as follows:

Table 1. Overall Biannual System Efficiencies

No.	Month	Water production m ³	Water billed m ³	System Efficiency%
1	January	2,871,327	1,824,223	63.5%
2	February	2,735,615	1,891,957	69.2%
3	March	3,267,718	1,893,233	57.9%
4	April	3,339,128	1,940,826	58.1%
5	May	3,365,132	2,139,399	63.6%
6	June	3,653,398	2,316,294	63.4%
Total		19,232,318	12,005,932	63.0%

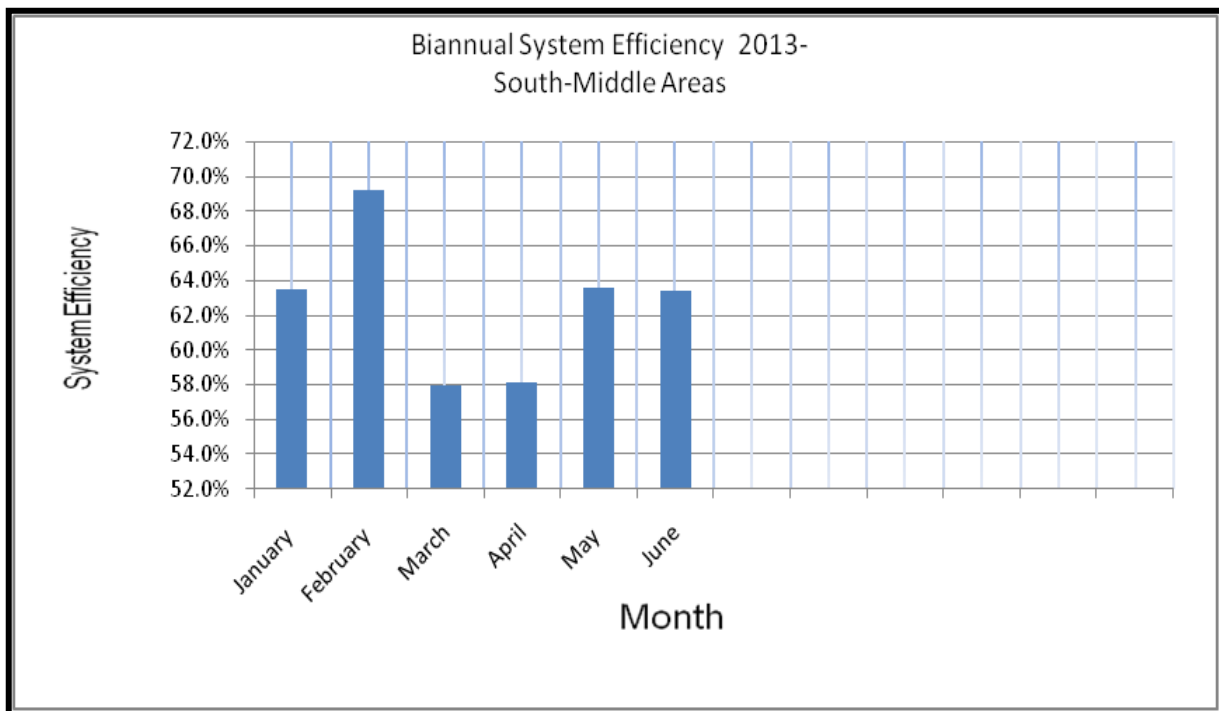


Figure 1. Biannual System Efficiency 2013, Middle-South Areas

The low system efficiency occurred during months March and April 2013 can be attributed to the large number of illegal connections mainly in Khan Younis and Middle area municipalities.

The efforts and initiatives to improve the system efficiency have continued during the 1st year of WSSIP project, these are outlined below:

- Network Rehabilitation:

The water mains rehabilitation and repair program in the 20 municipal areas have continued to be applied by CMWU repair and maintenance team works including mobile workshop specialized for such purposes. All the sites have been successfully handed over and operated again. The work for the construction and rehabilitation program of water distribution networks was carried out based on criteria that was oriented towards reducing the unaccounted for water.

- Meter Installation:

The meter installation program has been initiated and continued during the period of this report from Jan to June 2013. It is anticipated that the effect of the installation of new accurate meters, particularly replacing blocked meters, will continue to improve the overall efficiency of the system. During the period of six months of project 1st year, a total of 5900 meters were issued and installed throughout different areas to replace blocked meters and to provide for new connections as well.

The meter installation program was extended to cover non-metered buildings including Hospitals, Schools, Masjeds, 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 responsibility of the municipalities to take the readings of these buildings even if they are exempt from water fees has been discussed at municipal level.

- Network Repair and Maintenance:

A comprehensive network repair and maintenance program was introduced to the targeted areas during the 1st year of WSSSIIP Project.

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 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 stores.

A summary of the 268 repair jobs performed during the period from January 2013 to end of June 2013 are listed in the following table:

Table 2. Repair Jobs January – June 2013

No.	Municipality	January	February	March	April	May	June
1	Al Zahra		2		3		4
2	Wadi Gaza		1			3	
3	Musader					1	
4	Wadi Al salqa			2			
5	Moghrakah		3			1	
6	Buraij	1		4		2	
7	Maghazi	6	7	14	8	6	4
8	Deir Balah	10	10	6	11	8	5
9	Zuwaida	2		6	5	4	6
10	Nusirat		4		5		4
11	Khan Younis	5	3		8	2	6
12	Khoza'a		1			1	2
13	Qarrara		3		3		
14	Abassan Kabira	1	1	2	2		1
15	Bani Suhaila		3		2		1
16	Abassan Jadidah			1		1	
17	Al Fukhari			1			
18	Al Naser		2		2		
19	Al shokah		1		3		
20	Rafah		10	15	9	8	10
Total		25	51	51	61	37	43
Total Repairs		268					

This program of water distribution networks repairs has contributed significantly to the reduction of the unaccounted for water. PMU 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.

1.1.1 Wells Construction Progress:

Currently and due to increasing demand for water in some areas (Deir El Balah, Khan Younis, Rafah and Gaza cities); many water wells are either in progress of construction to be ready for water production or have been put in operation. The descriptions of activities are listed as follows:

1. Drilling, construction and equipping of new Abu Hamam water well of 50m³/Hr production capacity to serve 15000 inhabitants of Deir Al Balah people in the middle area funded by IsDB. The water well was purposely drilled to relocate one of the existing wells close to Israel security fence and since more than ten years it has been out of service. All works have been completed, tested and the well is in operational mode.
2. Electromechanical equipping and installations including civil works construction of Al Siyafa water well in Beit Lahia of production capacity 70m³/hr funded by IsDB and serving 15000 m³/hr inhabitants. The water well is equipped with pumping systems with all associates, electrical control switchboard, construction of operator buildings and boundary wall with Gate. All works and installations have been successfully completed, tested and the water well is in operational mode.
3. Tender documents with all associated procurement and technical documents have been completed and launched to relocate water well F192 of production capacity 60m³/hr and serving 15000 inhabitants in the middle area municipalities (Al Nussirate and Al Bureij areas) . Also the works shall include for electrification of two water wells in the area F191 & F192 which are currently operating only by diesel generators.
4. Rehabilitation and upgrading of Malaysian Water Well in Al Shoka – Rafah (funded by IsDB); this well has been operating since December 2012.
5. Construction of water well in Al Qarara area funded by Muslim hands in progress.
6. Also the PMU in cooperation with CMWU followed up the following water wells activities at 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.
7. Yafa water well at Jabalia: follow up the pumping test.



Figure 2. Drilling and Equipping of a Water Well

1.1.2 Electromechanical Progress

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 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 occurs daily in Gaza.

Moreover, PMU in cooperation with 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
- Electrification of three water wells at al Esraa area western of Khanyounis
- Electrification of abu Hamam new water well eastern of Deir Al Balah
- Completed the connections installation of electricity grid lines to several 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 41 electrical repair jobs were carried out and completed.
- Manage and carry out usual inspection of electrical panels and generators at all 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.
- Design; 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.
- Manage and supervise implementation of specialized service contract.

- Manage and arrange for procurement of all essentially required spare parts and equipment for CMWU warehouse stock recovery program.

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 95 predictive, preventive and corrective maintenance job orders were carried out and applied at various areas.



Figure 3. Generator in Al Shokah on line Booster Station



Figure 4. Water Meters Stocked at CMWU Stores

B) 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 six water pumping manifolds for both water and wastewater pumping stations.
- Repair and adjustment of 8 water meters for water wells exits
- Arrange for all metal works installations required to connect Al Salam brackish water RO desalination plant in Rafah to Al Brazil water distribution zone.

- Mechanical repair of water distribution valves on the network throughout all operating areas.
- 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.

1.1.3 Water Wells Functionality Progress

The functionality of Water Wells Task aims to make sure that all breakdowns of water wells in Rafah Area, Khan younis Area and Middle Area will be rectified in a very short time to achieve the satisfaction of the water customers in those areas.

The functionality 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:

Q_w : flow rate of each well.

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

D_m : No of days of the month

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 97%.**

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 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 sites of water production wells at the same time out of service waiting for repair or refurbishment.

The water wells functionality measured throughout the services areas for the 1st half of year 2013 has been shown here below:

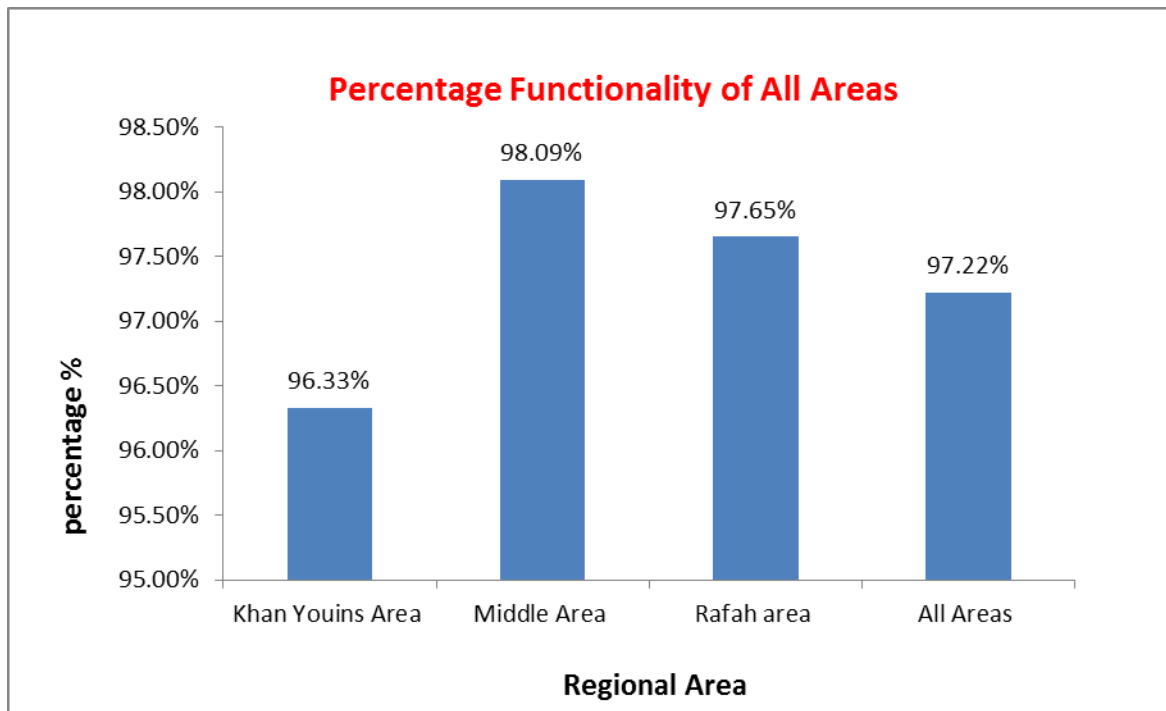


Figure 5. Functionality Percentage for served Areas

The registry of major mechanical and electrical repairs and maintenance job orders show that during this period 76 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 and manage 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 24 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 10 sites in Khanyounis and Rafah and the middle area have been covered during the period of this report.

1.1.4 Water Wells Energy Consumption

The objective of this task 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 1st half of 2013, the prevailing conditions of electricity cut off occurred and scheduled on daily basis has become part of the operating inputs for the system ,and the target for specific power consumption of WSSIP project 1st year have been achieved of less than **0.5 KWh/m³** of water produced from wells.

PMU and CMWU has continued to manage the efficiency of the pumping equipment utilized in the water wells, where more than 15 water wells pumps turbines throughout several services areas have been replaced and changed by new more efficient turbines by IsDB parallel fund. This intervention improves the pumping efficiency and reduces the specific power consumption.

The management program set for monitoring of energy consumed by water production wells shows that during the first half of year 2013 , the overall specific Energy consumption in the three targeted regional Areas is **0.472 KWh/m³**, all as illustrated here below :

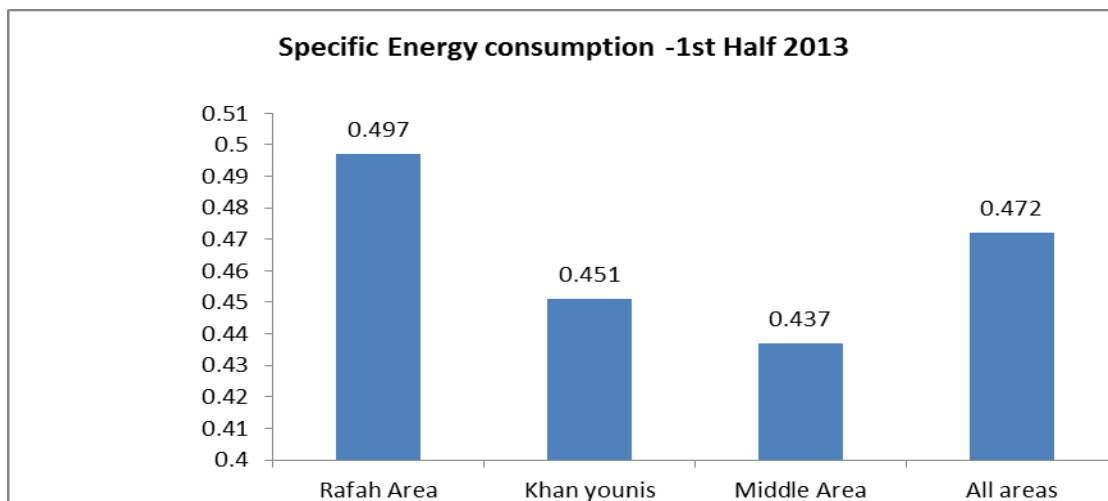


Figure 6- Specific Energy Consumption 2013

1.1.5 Water Quality Monitoring Progress

Improve Water Disinfection

The project first year target of 99.8% coverage has been very challenging, the maximum recorded disinfection efficiency for the period January 2013 – June 2013 is **99.5%**. Throughout the period of six months the disinfection efficiency has progressively increased successfully maintaining a high level of Chlorination throughout the distribution network. As indicated through the chlorine monitoring program, PMU and CMWU is confident that 99.5% of the network can be disinfected using the chlorination systems installed. Managing and sustaining this maximum efficiency through the effective maintenance and repair program has resulted in an excellent performance and conclusion to this task.

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

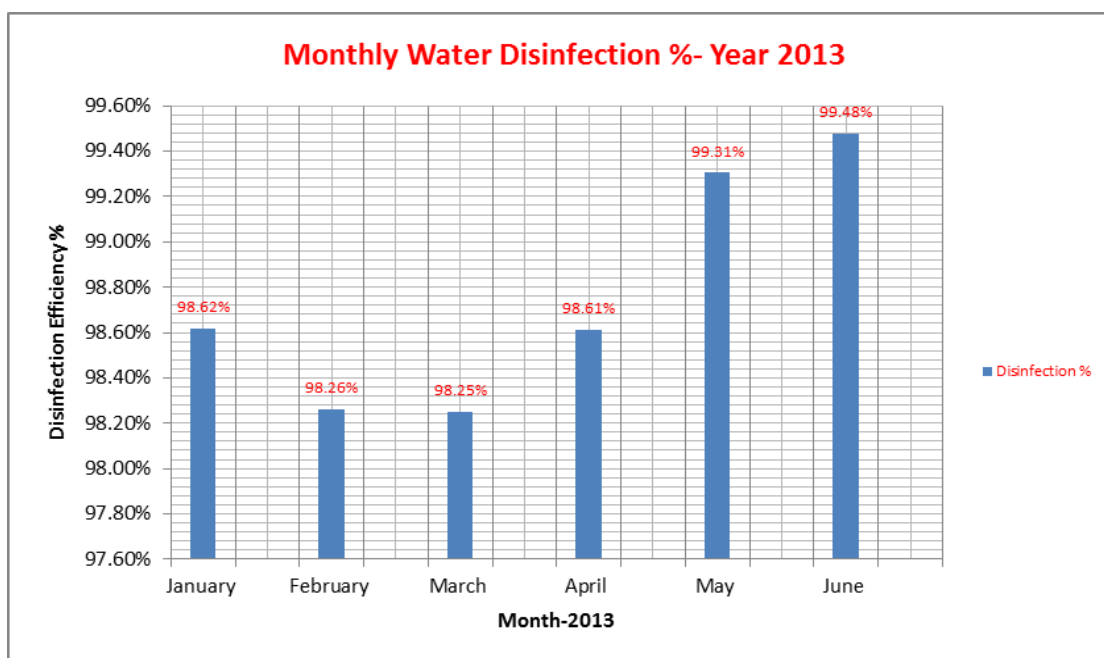


Figure 7- Monthly Water Disinfection Percentage 2013

a) Chlorine Supply and Delivery

Since the start of WSSSIP Project a total quantity of **464m³** of Sodium Hypochlorite NaOCl (10%-12% active chlorine) has been supplied and distributed to the water production and treatment installations in the Gaza Strip.

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 brackish and sea water desalination plants in Gaza strip. This includes Hydrochloric Acid, citric acid, Sodium Metabisulfite, Caustic Soda and Anti-scalant and ferric chloride.



Figure 8-Chlorine Dosing Unit

The provision of these chemicals is essential to the operation of the desalination plants, and contributes significantly to the improvement of water quality in the areas supplied.

The supply and delivery follow almost the same procedures introduced as per WB procurement guidelines for the supply and delivery of Chlorine. The table below shows the quantities of chemicals supplied to the desalination plants from the start of WSSIP project

Table 3. Supplied Chemicals January-June 2013

Chemicals Supplied From 1st Jan 2013 to End Jun 2013 (Ton)		
Municipality	Chemical	Quantity (ton)
Khan Younis (Desalination Plants L43/L87)	Hydrochloric acid	6.5
	Caustic Soda	3.5
	Sodium Metabisulfite	0.50
	Antiscalant	2.5
Rafah (Desalination Plants Salam/Sheoot)	Hydrochloric acid	4.5
	Caustic Soda	3
	Sodium Metabisulfite	0.50
	Antiscalant	3
Bani Suhaila (Desalination)	Hydrochloric acid	4.5
Deir Al Balah Brackish water J32	Hydrochloric acid	3
Deir Al Balah Sea Water Desalination Plant	Caustic Soda	3.5
	Sodium Metabisulfite	0.50
	Antiscalant	3
	Hydrochloric Acid	3
Al Nussirate Ro Desalination Plants –Taj Al Waqar &Al Forqan	Caustic Soda	3.00
	Sodium Metabisulfite	0.50
	Antiscalant	3.50

b) 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 570 locations (sampling points) carefully selected to give a true representation of the whole distribution network. The results of the program continue to be saved in the database designed to establish a historical reference, where detailed Monthly disinfection reports are monthly produced and issued.

It is clearly shown that by the end of June 2013 there is a significant achievement in which the disinfection efficiency targets of the network has been progressively approached and reached of around **99.5%**.

The test results show a maintained residual chlorine level that is consistent within each municipality. During the first half of year 2013 CMWU has 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 summarised in the table provided here below:

Table 4. Water Disinfection Monitoring Program

No.	Municipality	No. of Sample	Jan-13		Feb-13		Mar-13		Apr-13		May-13		Jun-13	
			Negative -No. Samples	Positive- No. samples	Negative -No. Samples	Positive- No. samples	Negative -No. Samples	Positive- No. samples	Negative -No. Samples	Positive- No. samples	Negative -No. Samples	Positive- No. samples	Negative -No. Samples	Positive- No. samples
1	Um Al Nasser	9	0	12	0	9	0	9	0	9	0	9	0	9
2	Beit Hanoun	19	0	19	0	19	0	19	0	19	1	18	0	19
3	Beit lahia	26	0	26	0	26	0	26	0	26	0	26	0	26
4	Jabaliala	42	0	42	0	42	0	42	0	42	0	43	0	42
5	Gaza	86	1	85	1	85	2	84	2	84	1	85	2	84
6	Wady Gaza	12	0	12	0	12	0	9	0	12	0	12	0	12
7	Al Moghraka	12	0	12	0	12	0	12	0	12	0	12	0	12
8	Al Zahra	12	1	11	1	10	2	10	1	11	0	12	0	12
9	Al Nusseirate	24	0	24	0	24	0	24	0	24	0	24	0	24
10	Al Burij	20	1	19	0	20	0	20	1	19	0	20	0	20
11	Al Maghazy	24	0	24	0	24	0	24	0	24	0	24	0	24
12	Al Zawaida	24	2	22	1	23	2	22	0	24	0	24	0	24
13	Al Mussader	12	0	12	2	10	1	10	0	12	0	11	0	12
14	Deir Al Balah	30	0	30	2	28	0	30	0	30	0	30	0	30
15	Wady Al Salqa	12	0	12	0	12	0	12	0	12	0	12	0	12
16	Al Qrara	16	0	16	0	16	0	16	3	13	0	16	0	16
17	Khanyounis	44	1	43	0	44	0	44	0	44	0	44	0	44
18	Bani Suhila	20	0	20	0	20	0	20	0	20	0	20	0	20
19	Abssan Al Kabera	18	0	18	0	18	3	15	1	17	1	17	1	17
20	Abssan Al jadedda	16	0	16	0	16	0	16	0	16	0	16	0	16
21	Khezaa	16	0	16	2	14	0	16	0	16	0	16	0	16
22	Al Fokhary	12	0	12	0	12	0	12	0	12	0	12	0	12
23	Al Nasser	12	2	10	0	12	0	12	0	12	0	12	0	12
24	Al Shuka	12	0	12	0	12	0	12	0	12	1	11	0	12
25	Rafah	46	0	46	1	45	0	46	0	46	0	46	0	46
Total		576	8	571	10	565	10	562	8	568	4	572	3	573
Monthly Disinfection Efficiency			98.62%		98.26%		98.25%		98.61%		99.31%		99.48%	

Table 5. Total Biannual Production (m³) January-June 2013

NO.	Municipality	January-2013	February - 2013	March-2013	April-2013	May-2013	June-2013	Total
		m ³	m ³	m ³	m ³	m ³	m ³	m ³
1	Um AL Nasser	13559	11758	11789	15215	17253	18185	87758
2	Beit Hanoon	284270	244501	254750	332865	334451	354227	1805065
3	Beit Lahia	509958	404943	514055	549264	548999	592177	3119396
4	Jabalia	996824	927198	809035	997262	941399	1081646	5753364
5	Gaza	2870898	2425516	2537426	3011967	3917033	3668221	18431060
6	Wadi Salqa	5560	6960	11440	11840	19520	12760	68080
7	Wadi Gaza	7570	6490	8360	9030	8570	11390	51410
8	Al Moghrakah	41590	44010	66380	89500	65630	79800	386910
9	Al Zahra	29778	26788	32100	32521	39948	40197	201332
10	Al Nussirate	293700	285340	342950	341300	350790	407670	2021750
11	Al Buriej	122097	90760	110129	119047	131304	136049	709386
12	Al Maghazi	103874	118877	118868	117097	140655	140643	740014
13	Al Zawiada	79216	84302	83749	117860	116105	132245	613477
14	Al Musader	10150	12880	13670	12233	13240	22080	84253
15	Deir Al Balah	366008	331622	405257	443061	417558	414517	2378023
16	Al Qarara	91934	87510	126580	102008	131414	142540	681986
17	KhanYounis	726911	669157	775391	781589	813935	885053	4652036
18	Bani Suhaila	110910	116170	142690	141920	151520	142630	805840
19	Abassan Kabira	83959	83959	105701	102505	107893	115611.5	599628.5
20	Abassan Jadida	30570	29150	41100	28130	35000	35000	198950
21	Kheza'a	37350	35050	38540	48000	50270	45690	254900
22	Al Fukhari	21200	19600	18860	19888	25600	27600	132748
23	Al Nasser	24540	25920	30400	36680	36610	50290	204440
24	Al Shokah	39125	38960	36524	35850	46060	44560	241079
25	Rafah	625450	602110	736593	722763	658322	767073	4112311
Total Biannual Production (m ³) -Year 2013		7527000	6729531	7372336	8219395	9119079	9367855	48335196

c) Chlorine Dosing Units

PMU and CMWU have continued to manage the repair and replacement of faulty dosing units. A number of new chlorine dosing units were installed to replace defective units. Technical specifications for installation were issued to the Municipalities and regional offices.

The following table summarizes the number and location where new dosing units are installed and where repairs have taken place during the period from 1st January 2013 to the end of June 2013.

Table 6- Repair Works for dosing pumps

Municipality	Number of repairs	Number of new dosing units installed	Well
Khanyounis	21	2	Maan, Al Shaer (L176)
Jabalia	12	1	YAFA
Nusairat	8	1	Hiteen Well
Deir El Balah	15	1	Culture center well
Beit Lahia	5	1	Al Siyfa
Beit Hanoon	3	1	Al Awqaf well C76
Qararah	7	-	
Bani-Suhaila	2	-	EV 01, EV03
Abasan Kabirah	2	-	
Rafah	14	-	P52, P124, P138, P144

Also, 9 residual chlorine field testing photometers have been procured and made available for nine municipalities to carry out on site sampling, testing and monitoring of water disinfection throughout water supply and distribution systems.

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

During the first half of year 2013 CMWU has provided additional 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.

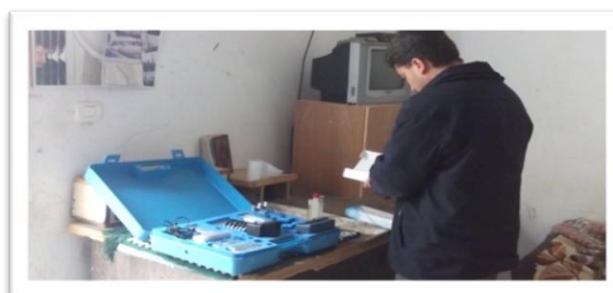


Figure 9. Monthly Water Disinfection Efficiency

d) Training

During the first half of WISSSP 1st year of the project the PMU is aware that the technical skills and resources vary between each Municipality. To reduce the impact on the project; CMWU encouraged the utilisation and transfer of skills among Municipal staff, as well as, arranging practical training sessions for the Electrical and Mechanical Tradesmen who are in charge of water disinfection tasks

○ Utilisation/Transfer of Skills

Some Municipalities have found it difficult to provide the resources to repair faulty dosing pumps either due to the lack of skilled technicians or the availability of skilled staff. To alleviate this problem PMU arranged for the skilled Chlorine technicians to repair the fault pumps from other areas, this process was co-ordinated and supervised by PMU creating pool of expertise. It is hoped that this will continue to develop into a transfer of technical skills among Municipalities.

○ Tradesmen Training

As part of the long-term training program, the Mechanical and Electrical tradesmen from various Municipalities have been attending practical training courses organised by CMWU. The training covers in addition to the monitoring skills the Operation and Maintenance procedures relating to the Chlorine dosing pumps including the Health and Safety awareness/restrictions during the repair activities.

During the period of 1st year 2013, CMWU has provided safety equipments to the Utility staff that comes into contact with the Chlorine and Chlorination systems on a regular basis. A periodic supply of safety equipments have been arranged with the chlorine supplier to included equipments such as goggles, gloves and protective clothes. Also, for those who are not normally dealing with the Chlorine systems directly, CMWU has organised a supply of safety equipments that are available to be distributed as required.

○ Training Session

PMU arranged for two training sessions for both middle area and Southern area operating teamwork's each of two days training session for all chlorination technicians and engineers during February 2013. The subject was related to the safety and emergency procedures and general drinking water disinfection methods, with specific attention to Sodium Hypo-Chlorite solution.

The course was well attended by participants from each Municipality and regional operating areas of 25 participants for each session.



Figure 10. Training Session – Water Disinfection and Chlorination

1.2 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 relief 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 has attracted 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.

PMU and 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.

Taj Al Waqar RO Desalination Plant –Al Nussirate, Middle area

CMWU has completely constructed new brackish water desalination plant at Al Nussirate area (Taj Al Waqar water well) funded by INTERPAL. The plant includes supply and installation well head brackish water RO desalination plant of total production capacity 25m³/hour desalinated water ,where 10000 inhabitants of Nussirate refugee camp are served by drinkable quality of water (TDS less than 300ppm).On January 2013 The plant was successfully tested , handed over and brought into operational mode.



Figure 11. Taj Al Waqar Water Desalination Plant-Al Nussirate

Al- Forqan RO Desalination Plant –Al Nussirate

During the period of this project 50m³/hr (1200m³/Day) well head brackish water RO desalination plant funded by Unicef has been also constructed and installed at existing Al Forqan brackish water well in Al Nussirate area .The plant was completed and tested in May 2013 and brought into operating mode to serve 15000 inhabitants with drinkable and healthy water services of TDS less than 300ppm.

Extension of Existing Deir al Balah Sea Water Desalination Plant –Middle area

2000m³/Day sea water RO desalination modules funded by IsDB are now in the process of construction and it will be linked and connected to the existing 600m³/Day module ,producing in total 2600m³/day to serve 30000 inhabitants of the middle area residence (Deir Al Balah & Al Zawaida cities) through planned blending schemes with water from wells .All civil works have been almost completed and electromechanical installations and equipment shall be shipped from Italy down to Gaza strip in which an appropriate co-ordination with Israeli authorities shall be made to facilitate the entry of the materials and equipment .The targeted completion date is end of December 2013 ,subject to the equipment delivery through commercial gates between Gaza and Israel.



Figure 12. Construction of Seawater Reservoir in Deir Al Balah RO Desalination Plant

Design and construction of 6000m³/Day Sea Water Ro Desalination Plant

As part of implementing STLV sea water desalination plan initiated by PWA, new 6000m³/Day sea water RO desalination plant shall be constructed and operated to serve 75000 inhabitants of both Khanyounis and Rafah western parts .The project is funded by EU and implemented by Unicef in co-operation with PWA & CMWU and both ESIA and design documents are nearly completed and tendering for construction of the plant shall be initiated and carried out early next October 2013. The plant shall mainly comprise of the following items:

- Four sea water beach wells each of 200m³/hour capacity
- Three sea water RO desalination trains each of 2000m³/Day production capacity.
- Electrical sub-station and three standby generators (3x0.66MW) with all associated electrical works and installations.
- Chemicals storage and dosing systems
- Permeate water storage tank and booster station
- Plant truss building and site landscaping
- Administration building and ancillary facilities
- Rehabilitation and upgrading of existing water carrier line connecting between the plant and the two existing water blending reservoirs.

1.2.1 Mechanical Repairs Progress

During the period of this report from January to June 2013, several mechanical refurbishment repairs, upgrading works and repair 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. Rehabilitation and repair of damaged borehole screen filter at Berka water well K21 in Deir Al Balah .The work includes also for replacement of defective vertical turbine water pumping set with all associated piping and drive shafts by IsDB parallel fund.
2. Deepening and repair of Al Naser water well No.2 in order to increase the water column inside the borehole for safe operation conditions of the pump. Also, the pump turbine has been upgraded with higher number of stages to cope with water system and pumping hydraulic characteristics and requirements by IsDB parallel fund.
3. Replacement of submersible water pumping set of Al Naser water well No.1 by vertical turbine water pump with all associated fittings and accessories by IsDB parallel fund.
4. Repair and rehabilitation of Al Forqan water well pump turbine, where new turbine has been installed.
5. Supply and install vertical turbine water pumping set at Mosabeh well in Rafah to replace deteriorated submersible pumping set.
6. Mechanical upgrading and rehabilitation of water pumping set in Maan water well in Khanyounis.
7. Replacement of damaged 20hp electric submersible motor for Taj Al Waqar well in al Nussirate.
8. Rewinding of reject water submersible pump in Banisuhaila brackish water desalination plant.
9. Mechanical rehabilitation and repair of vertical turbine water pumps at Rafah water wells W1 and P145.
10. Rewinding of 75hp electric motor for AL Nuwairi water well M11 in Bani-Suhaila.
11. Mechanical overhauling and repair of malfunctioned vertical turbine water pump in Al Shawa well in Beit Lahia .
12. Rewinding of 150hp electric drive motor for Al Salateen water well in Beit Lahia.
13. Repair and rehabilitation of gland seal and replacement of main bearing for one of end suction KSB horizontal centrifugal water pumping set.
14. 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 .All units have been completed ,tested and brought into operational mode .
15. Replacement of 6 deep well vertical turbines in water wells of Khanyounis and Rafah in order to improve energy consumption and pumps efficiencies by IsDB parallel fund.
16. Completion of new installation of water booster station comprising of three pumps with all associated electromechanical installations at Saudi water reservoir of Rafah.
17. Completion of all mechanical and electrical installation required to provide Al Siyafa well in service mode in Beit Lahia.



Figure 13- Rehabilitation of Taj Al Waqar Water Well, Al Nussirate

18. 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 WB, GCC/IDB, UNRWA, UNICEF, OCHA (HRF) and other donors .This task has become one of the life supporting systems in Gaza strip which is 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.



Figure- 14 Fuel Supply and Distribution

19. 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.

1.2.2 Electrical Works Progress

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

1. Manage, supervise and carry out all procurement required for specialized electrical service contracts including the procurement of essentially required stock of spare parts and equipments.
2. 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.
3. 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.
4. 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.



Figure. 15 Electrical Control Switch board



Figure.16- Repair of a High Pressure Pump

1.2.3 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.

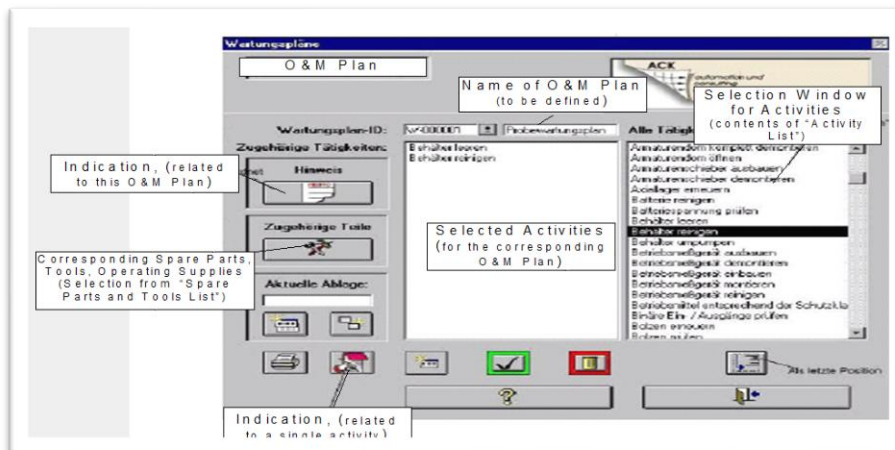


Figure 17- CMMS Screen Shot

1.3 Water Networks and Reservoirs

This section handles water network plans, upgrading, rehabilitation activities, water tanks activities and water booster pump stations activities as CMWU succeed during the period of this report to implement a lot of water networks project varies between rehabilitation , upgrading , and construction new carrier lines and distribution systems in different areas of the Gaza Strip as follows:

1. Completed Rehabilitation of Water Networks at Eastern area of Jabalia , the project is financed by IsDB
2. Completed Rehabilitation of Water Networks at (Dair El Balah Camp and Bani Suhila) the project is financed by IsDB
3. Completed Rehabilitation of Water Networks at the middle area of Gaza Strip , this project is financed by IsDB
4. Completed Rehabilitation of Water Networks at Beit Hanoun , this project is financed by IsDB
5. Completed Rehabilitation of Water Networks at (Khan Younis and Rafah Governorates), this project is financed by IsDB.
6. Completed "Construction of Water Carrier lines and Distribution Networks at Al Moghraka Area, the project is financed by IsDB.
7. Completed "Rehabilitation of Water Networks at Rafah, the project is financed by IsDB.
8. Completed "Construction of Water Networks at Al Nussairat, the project is financed by Islamic Relief.

In addition more than five reservoirs are under construction now:

- In progress "Construction of Water Tank 3000 m³ and Pumping station in Al Moghraka "this project is financed by IsDB.
- In Progress "Construction of Water Tank 4000 m³ at Bani Suhaila the project is financed by IsDB.

- In progress "Construction of Water Tank 4000 m³ at Dair El Balah the project is financed by IsDB.
- In progress "Construction of Beit Hanoun water tank 3000 m³ capacity." Financed by UNDP.
- In progress "Construction of Om Al Nasser water tank 4000 m³ capacity" Financed by UNDP.



Figure. 18 Construction of Al-Moghraka Water Tank

1.4 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 describe the main activities implemented in all the treatment plants to improve their treatment efficiency.

1.4.1 Beit Lahia WWTP:

Cleaning the two anaerobic ponds no. 1 and 2 in BLWWTP completed in May 2013 and that increases the capacity of the ponds however the treatment efficiency of the plant takes two months at least to touch the improvement which reached **67%** by end of June 2013.

1.4.2 Gaza Central Sewerage Project:

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

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

Due to the political situation in the Gaza Strip, the project was 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 construction of PS1, and constructing the pressure line of diameter 600 mm with total length 4500 meters.

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

- The contract No. 1 was for supplying materials and all the materials and equipments were submitted to CMWU/MOG.
- The contract No. 2 was for construction works at the pump station (Pump station No. 1); the pump station is operational now, construction sludge drying beds at East Bureij and GWWTP site beside two sludge holding ponds at GWWTP. In addition to install 500 mm ductile Iron pipe from pump station 2 to pump station 1 and 600 mm DI pipe line from pump station 1 to the treatment plant, that all with works at the treatment plant (inlet structure, bar screen, grit removal, bio tower feed PS, 4 new bio towers , and some internal piping and connections).

The two contracts are now under the defect liability till end of this year, the result of upgrading GWWTP has been reflected on the capacity of the plant which has been increased from 40,000 m³/d to 90,000 m³/d, and also improve the efficiency of the treatment to reach by end of June 85%.

- Preparation for contract three is in process; the contract will cover the operation of the treatment plant and support the missing requirements in contracts 1, 2.
- Preparation for contract 4 is in process; the contract will cover the rehabilitation of PS 3 and supporting PS 2. The contract will also include repair the sea water pipeline from GWWTP to the sea and installation of a new pipeline from PS 3 to PS 1.
- Preparation of contract no. 5 is in process; the contract will cover protection for the Wadi Site at Al Buraij site in addition to the construction of the access road to the central wastewater treatment plant.

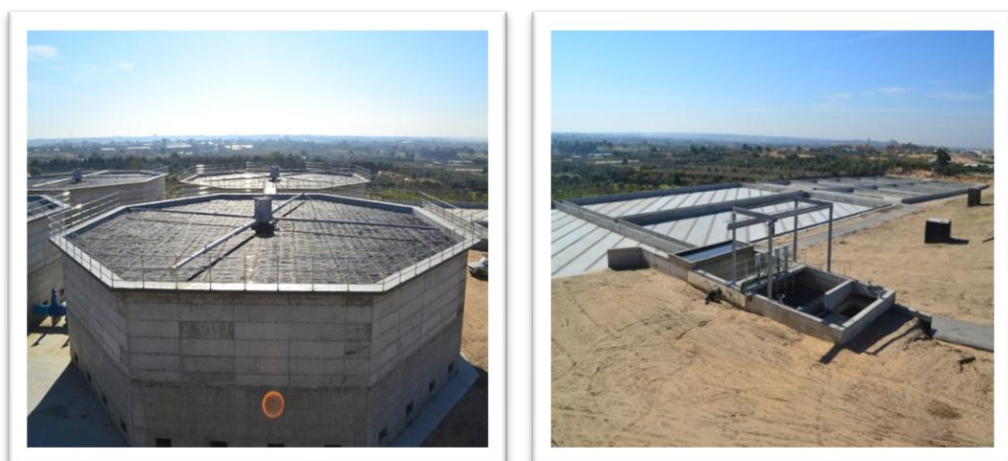


Figure. 19 Gaza Wastewater Treatment Plant

1.4.3 Rafah Wastewater Treatment Plant (RWWTP)

Cleaning the two anaerobic ponds no. 1 and 2 in RWWTP completed in June 2013 and that increases the capacity of the ponds and will improve the treatment efficiency of the plant in the coming months as it reached end of June 74%

1.4.4 Khanyounis Temporary Wastewater treatment plant (KhTWWTP)

During the period of this report upgrading activities at Khan Younis WWTP have been completed, in order to increase the treatment capacity to reach 12000 m³/d and improve the treatment efficiency, her under list of these implemented activities

1. Construction of new inlet structure fine bar screen and grit removal.
2. Increasing number of aerators at the aerated lagoons
3. The second anaerobic lagoon was converted to completely mixing aerated lagoon by adding new six aerators.
4. Lagoon No.4 was divided for two lagoons 4A & 4B one for settling and the second for polishing.
5. Repairing the polyethylene sheets for the ponds to prevent WW seepage.
6. Cleaning the ponds from the accumulative sludge and removing it to dumping site after de-watering.
7. Planting trees around the external fence in order to reduce sand accumulation in the ponds.

All these upgrading works have improved the treatment efficiency in the plant to reach 76% end of June



Fig (15)

Figure. 20 Khanyounis Wastewater Treatment Plant

1.4.5 Wastewater Activities in Middle Area Governorate (WGWWTP)

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. Implementation phase of Wadi Gaza Wastewater treatment plant is in progress, this project includes two components (Wadi Gaza IWWTP 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 (IWWTP) 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 intermediate 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, protection to the embankment to prevent from seasonal flooding, 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 internal and external works which are 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

Wadi Gaza WWTP currently under construction where construction of the second component of Wadi Gaza project" Sewage Pressure line from UNRWA Sewage pumping station to Wadi Gaza WWTP has been completed.



Figure. 21 Wadi Gaza Wastewater Treatment Plant

1.5 Storm Water Activities

1. The CMWU has lunched consultancy service for” *The Detail Design of Retention and Infiltration Basin in Al Amal Area at Khanyounis Governorate*”. Recently PALTEL Group Foundation has allocated a grant for rectifying Al Amal lagoon to be a retention pond and infiltration basin at wet season and a recreational area in the dry season, in addition to eliminate any sewage connection to the storm water network in Khanyounis. Construction phase will be lunched once the Consultant finishes the design.
2. Construction of Storm Water Network, Storm Water Pond at Rafah Municipal Area project will be launched in one week. This project is finance by PALTEL Group Foundation and the main activities of this project are:-
 - Implementation of storm water pipelines of diameter 45 cm up to 100 cm with all associated manholes, gullies.
 - Implementation of storm water pond, infiltration boreholes.
 - Pressure pipeline from Al Junina pumping station and the nearest existing network.

1.6 Waste Water Pump stations and networks

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

1. In progress “Repair and maintenance of water and wastewater networks through Gaza strip” funded by UNICEF.
2. Prepare the design for Al Berka wastewater networks. Kfw is committed to finance this project of a total amount 1.1 M Euros.
3. Prepare the tender documents for re-construction UNRWA PS at Al Nussirat through ICRC support.
4. Completed “cleaning and rehabilitation of Al Qashash main Gravity wastewater line” funded by ICRC.
5. Assist the ministry of public works and housing in the following activities:-
 - i. Review the tender documents for Khalifa city project
 - ii. Review the tender documents for Hamad city project
 - iii. Review infrastructure design drawings for Salah El Deen Street.
6. Completed Upgrading of Al Hawaber pump station and construction of a pressure pipeline from Hawaber pump station to the treatment plant at the Northern Area, the project is



financed by ICRC

Figure. 22 Construction of Al Hawaber Sewage P.L

7. Completed “Construction of Wastewater Network through Gaza Strip” the project was financed by IsDB.
8. Completed “Construction of Wastewater Networks and Household connections at the Southern Governorates” the project was financed by UNICEF
9. Completed “Construction of Wastewater Networks at Beit Hanoun” the project was financed by save the children.
10. Completed “Construction of Wastewater Pumping Station and WW Networks at Bani Suhaila” the project was financed by OXFAM
11. Completed “Construction of Wastewater Networks at Jamal Abed Al Nasser St. At Khan Younis” this project is financed by ANERA.
12. Completed “Construction of UPVC 450 mm gravity sewage line at Beit Hanoun, this project was financed by save the children.
13. Completed “Construction of Wastewater Networks at Al Kateba area. -Khan Younis” this project is financed by ANERA.



Figure. 23 Bani Suhaila Pumping Station



Figure. 24 Wastewater Networks in Rafah

1.7 Electromechanical Services - Waste Water Pumping and treatment Facilities.

During the period of this report from January to June 2013 ,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. Complete upgrading process of Al Alami sewage pumping station in Jabalia serving 10,000 inhabitants .The works and installations include for replacement of risers and the manifold, rising up the electrical panel board, also includes the erection and construction of new building to accommodate electrical switchboard. This intervention was funded by IsDB and it will solve historical flooding area used to occur every winter in the middle of Jabalia Refugee camp.
2. Complete upgrading works of Mahader sewage pumping station, the work included construction of new service room to prevent the electrical panel from getting submerged during flooding events.
3. Carry out detailed mechanical and electrical rehabilitation and repair works of mechanical bar screen in sewage pumping stations of Beit Lahia city e.g. Al Manshiya, Aslan 4, Aslan 5 & Al Mashroua'a including the replacement of steel deteriorated riser's pipes with stainless steel pipes. Also, electric hoist cranes were repaired at two sewage pumping stations Aslan No.4 and Al Mashroua'a .
4. Follow up malfunctioning relevant events during defects liability period of six mechanical floating surface aerators provided and installed at Beit Lahia wastewater treatment plant.
5. Manage and supervise the mechanical and electrical rehabilitation works of Al Hassayna sewage pumping station in Al Nussirate.
6. Carry out mechanical repairs of three Flygt type sewage pumps model 3300-181 at Deir Al Balah sewage PS (Al Basa area).One new pump has been procured and installed at the designated pumping station which serves both Deir Al Balah and Al Zawaida municipalities of about 50000 inhabitants.
7. Carry out mechanical and electrical repair and rehabilitation installations for mechanical bar screens of both Al Wafiya and Hesbt Al Samak sewage pumping stations in Khanyounis area .Also, erection of safety fencing around al Amal infiltration , and one of mobile diesel driven pumps was repaired and brought into operating mode for water and wastewater flooding management purposes.
8. Manage and carry out complete mechanical overhauling and repair of KSB submersible sewage pumping set at Jemazit Al Sabeel pumping station in Rafah including the replacement of impeller ,mechanical seal and set of bearings .Also, valves systems and no return check valves have been also repaired and maintained .
9. Mechanical repair and overhauling of ABS sewage pumps in RWWTP which are serving trickling filters.
10. Manage the installation of new transmission gear box for sewage jetting vehicle of Rafah area and bring it again into operational mode.
11. Replacement of deteriorated Galvanized Steel wet pit covers with stainless steel ones with better design to get rid of accumulation of toxic gases. Also, steel pipes of sewage pumps vertical risers shall be replaced by stainless steel pipes of sewage proof quality.

12. Carry out comprehensive repairs of sluice gates, gate valves ,check valves and electrical hoist cranes in all Ps in Jabalia and B .Lahia
13. Manage and carry out 17 electrical repair jobs at different sites e.g. programming PLC, replacement of soft starters, re-connections and cabling and repairs of controls.
14. 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, KHWWT, Saudi housing PS in Rafah and UNDP Housing PS in Khanyounis.
15. Carry out the repair of three mechanical floating service aerators at BLWWTP including rewinding motors and change the bearings.



Figure. 25 Installation of Mechanical Floating Aerator-BLWWTP

2.0 PROGRAM ACTIVITIES PROGRESS

2.1 Geographic Information System (GIS)

Through UNICEF donation, the GIS department at CMWU could accomplish surveying all waste water manholes in all of Rafah, Khan Younis, Deir El Balah and Nussirate cities, in which it will enable the CMWU to re-draw the waste water collection networks based on an actual field survey. The final maps will be integrated into GIS system and will be posted at later stage into web application for external users browsing.

2.2 Environmental Management Plan (EMP)

The PMU follows the different project activities, coordinates, monitors and measures the performance indicators during the report period. The Environmental Management Plan (EMP) has been designated to ensure effective implementation of the project in an acceptable environmental level.

PMU has established a field survey in cooperation with the CMWU to enable monitoring the current activities of different projects in the field. Those forms are being filled by supervision teams as shown in Annex no. 2.

Also the PMU analyze the water quality in all domestic wells in the governorates based on EMP procedures, added to that wastewater collection and sampling were carried out on almost a weekly basis based on EMP procedures as shown in Annexes no. 2 and no. 3 respectively.

From the ongoing monitoring of the different projects' activities running in the field, the environmental aspects are being observed and achieved.

2.3 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 PMU and 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 following steps were followed in order to enhance the collection efficiency in Rafah City :
 - a. Coordination and cooperation with legal institute to follow up the uncommitted customers.
 - b. Activation of illegal connection campaign through CMWU inspection unit, in order to raise the collection and enhance system efficiency.
 - c. Rewards Campaign for the committed customers.
 - d. Signing agreements with local banks for automatic payment for CMWU bills.
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 to develop the new Tariff proposal. The CMWU is now in the process to get the necessary approval before starting the application.
5. Participate in a committee aims to raise the concerns and requests of CMWU regarding the government support to water and sanitation service providers in Gaza Strip, through meeting with minster of Finance.
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, 46.0% in 2012 & 51.0% in 2013.

7. The collection figures decreased in 2012 due to the 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.
8. Prepare several proposal to different donors (UNICEF, EU), in order to support the CMWU customers services activities aimed at raising awareness among citizens on water issues, and encourage customers to pay their bills in order to participate in developing the sector.

Area	Collection Ratio	No. of Customers
Khan Younis	51%	15,837.00
Rafah	51%	17,324.00
Deir El Balah	22%	6,832.00
		39,993.00

3.0 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;

3.1 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. Held a workshop to represent CMWU's strategic plan for the coming Five years, the attendees were all our partners, stockholders, etc.
6. Ongoing negotiations between PWA, CMWU, Northern Municipalities, MOLG to hand over the NGEST operation to CMWU.

3.2 CMWU New Assets:

3.2.1 Construction of Water & Wastewater Lab.

last year the CMWU has finished construction of concrete works for the Water & WW central lab and CMWU headquarter In Al Zahra city (basement, ground and three floors) financed by ISDB.

During the period of this report, the CMWU lunched and completed Finishing works for the lab (ground floor) and the supplied equipments will be installed.



Figure. 26 Water and Wastewater Lab

3.2.2 Construction of CMWU Maintenance Workshop and Warehouse.

The CMWU as a service provider procures 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 condition. 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 in cooperation with PMU during the last year has constructed this maintenance workshop and warehouse through the parallel fund.



Figure. 27 CMWU Main Workshops and Central Warehouse

3.3 Donor's visits to the CMWU sites:

During the period of this report, many donors visited the CMWU projects which are currently implemented as follows:

1. On 12.04.2013 ISDB representatives visited Al Moghraka Water tank, Central Water and Wastewater lab at Al Zahra city, and Dair El Balah Desalination plant which are financed by ISDB.
2. On 16.04.2013 ICRC and Ministry of local Governorate technical teams visited different projects implemented by the CMWU including Wadi Gaza WWTP, Al Moghraka water tank, Water and Wastewater lab in addition to other sites.
3. On 17.06.2013 KFW, PWA and concerned municipalities visited the sites of the proposed wastewater networks' projects at Jabalia and Dair El Balah, which will be financed by KFW.
4. On 25.06.2013 WB Environmental specialist visited different sites including Abu Hamam Water well, Bani Suhaila Water Tank, CMWU Central Warehouse and workshop and other projects.
5. On 24.06.2013 TIKa representatives visited storm water project in Rafah which was financed by TIKa.



3.4 Follow up the World Bank Activities:

The main financing agency to the CMWU operation and maintenance activities is the World Bank, in order 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 the CMWU 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).

The procurement of ISDB activities are completed as detailed in Annex 4 (procurement Plan)

3.5 Public awareness campaigns:

Public Awareness campaigns implemented during the last six months relied on the methodology of raising the public awareness of water and sanitation in the Gaza Strip and concentrated on the following issues:

- Desalinated Water
- Saving water
- Cleaning tanks
- 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:

1. Training courses: Media & awareness unit implemented 1 training course, which targeted 35 trainees from all over Gaza Strip.
2. Workshops: Media & awareness unit implemented 20 workshops in all the 5 Gaza governorates.
3. Producing a short clip: Media & awareness
4. Radio Awareness Episodes: broadcasting 12 radio awareness episodes.
5. Bicycle Race in order to attract the media to concentrate water issues.
6. A Play about water at Al Meshal theatre
7. Media Materials including; 5 different stickers, 2 posters, 1 brochure, and the Strategic plan English and Arabic version.
8. Ceremonies: 4 closing ceremonies, 4 opening projects ceremonies, Press conference, and 1 World water Day ceremony.





Figure. 29 CMWU Public Awareness Campaigns and Ceremonies

3.6 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 ongoing activities in cooperation with other donors' agencies as;

ISDB: an agreement will be signed with ISDB, UNDP, PWA and CMWU to construct the Central Wastewater Treatment Plant at Khan Younis. And another agreement to implement 10000 m³ sea water desalination plant in Gaza city.

UNICEF: an agreement signed with EU, PWA, and CMWU to construct a sea water desalination plant between Rafah and Khanyounis 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.

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.

UNRWA: Coordinate with UNRWA in order to complete the two projects: (a) The Tal Sultan Sewage P S is now in operational mode, (b) Sewage Pressure carrier line in Khanyounis ,negotiation stage finished recently and the amendment for the old agreement will be signed soon.

QRC: has financed different projects to be implemented through 2012-2013 including electromechanical upgrading and maintenance for water wells and WW pump stations.

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

KFW: is committed to finance two wastewater projects of total amount 3.3 M Euro in cooperation with PWA and CMWU which are, construction of wastewater network in Anan area- Jabalia and the other is construction of wastewater networks in Al Berka area- Deir Al Balah.

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.

3.7 Classification and Codification of CMWU Stores Materials

The CMWU succeed to transport all the equipments and the materials in different warehouse to the central warehouse constructed recently; and in order to solve many problems in the old 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.

4.0 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 become 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.

5.0 Conclusion

Due to the over abstraction from the aquifer, the ground water became saline as a result of the seawater intrusion. Therefore, PWA in cooperation with CMWU 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.

PMU assists CMWU 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.

PWA and CMWU are working jointly with the WB and IDB in order to fulfil the new project's targets and continue monitoring and seek to improve the overall efficiency of the existing water and wastewater services through the WSSSIP.

END

Success Story

Hope Instead of Being a Nightmare

People of Bait Lahia Area are hoping to build a playground in the old place of the Bait Lahia wastewater arbitrary lagoons that PWA, CMWU and World Bank made it a dry land.

Abdullah, 11 year old boy, lives in a small house beside the Bait Lahia wastewater lagoons. He said that in the past they were afraid to come to this area because it was dangerous and they lost their friends who died in the lagoons specially his friend Anas Abu Rashed who died in the arbitrary lagoons.

Abdullah Continued that arbitrary wastewater lagoon were a nightmare to the whole area because of smell, space, and they were afraid to die or to drown in the lagoons. Now it is different, it is dry we can play football, games, running and think of creative ideas of this empty land. It became a hope instead of being a nightmare.

Beit Lahiya Treatment Plant

Beit Lahiya treatment plant was established in 1974 in Beit Lahiya by the Israeli Civil Administration in the outskirts of the town of Beit Lahiya in the northern area of the Gaza Strip. The plant was established a secondary treatment system in order to take up 5,000 cubic meters of wastewater per day to serve 50,000 people in Jabalya. The aim behind the plant establishment was to re-use the treated water for agricultural purposes but this aim was not achieved since the treated water –before it formed a lake- started to accumulate in the adjoining sand dunes and this imposed a threat to the neighboring area. The lake started to get wider because the quantity of pumped water was much more than the quantity the lake designed to absorb (20,000 cubic meters). As a result of Coastal Municipalities Water Utility (CMWU) efforts and in cooperation with the Palestinian Water Authority (PWA) and the World Bank, the expanded lake (2.5 Million cubic meters of wastewater) was drained by pumping the wastewater to the northern and eastern lagoons in the same governorate.

