

MANAGEMENT OF WATER PROJECTS UNDER EMERGENCY CONDITIONS IN THE GAZA STRIP

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ABSTRACT

Since its creation in 1996, the Palestinian Water Authority (PWA) has practiced its role in an attempt to achieve its mission which is to guarantee the most efficient management of available water resources in Palestine to achieve the balance between available water quantities and qualities, and the needs of the Palestinian people in the present and the future. In addition to the previous role the PWA has been implementing many water and wastewater projects to improve the water resources and infrastructure. The Palestinian territories have been affected by many Israeli restrictions and constrains which negatively reflect not only on the Palestinians life but also on the progress of projects and consequently additional expenses encountered. As far as PWA has already prepared a Water National Plan with detailed investment program for the next 5 years and outlined for the next 20 years reflecting the investment of water and wastewater projects with about five billion dollars, the Israeli restrictions and constrains will have more disastrous negative impact on such huge investment. Accordingly management tools applied on small scale projects should be upgraded to meet the requirements of such big investment.

The authors highlights the Israeli constrains and restrictions on water projects in the Gaza strip implemented currently and the procedures to be used by PWA to deal with such problems, in addition to propose the upgrading of the management tools to meet the requirements of the big investment.

Key Words: Project management, water infrastructure, planning, obstacles, and economy

BACKGROUND

Gaza Strip has a small area of 365 km² with a length of about 40km along the coast of the Mediterranean and a width ranging from 6.4 to 9.6 km. The total population of Gaza strip is approximately 1.1 million almost 60% out of them are refugees. The population density is estimated at 2700 people/km² in the refugee camps. The man power in Gaza Strip represents about 65% of the population. In the year 1994 implementation of the Cairo peace agreement have been started, since that time the Gaza Strip is suffering from a number of obstacles such as settlements and the so called Israeli security zones and borders not controlled by Palestinians. Solutions of

such obstacles were delayed to the time of final negotiation. In case of any political conflict Israel used to implement the policy of closure. The policy of closure is implemented as a two-tiered policy. The first type is general closure which, has been in place since Cairo peace agreement that prohibits Palestinians from the West Bank and Gaza from entering Israel and East Jerusalem unless they obtain a special time-limited permit from the Israeli security authority. The second type is called internal closure, which is imposed in case of any political conflict or negotiation failure. During such closures the Israelis cut or subdivide the Palestinian territories into many parts. The policy of internal closure has been periodically invoked over the past several months to seal Palestinian villages and towns, prohibiting movement between urban centers and literally imprisoning entire communities in their villages or towns. Forty (40) new military checkpoints within Gaza Strip have been erected, in addition to the control over 40% of the strip of settlement and surrounding areas of the Gaza strip. During the internal closure the situation has become particularly difficult and hard in the Gaza Strip, where materials, food, and fuel supplies have almost cut out. As a result, the economical situation of the Palestinians begins to be catastrophic. Moreover all plans and projects were negatively affected, not talking also about the high unemployment rate

INTRODUCTION

By Law No. 2, 1996 Concerning the Establishment of The Palestinian Water Authority requires The Palestinian Water Authority, among other duties and authorities under Chapter 2, Article (4) to “Participate in preparing and detailing regional water plans, and the supervision and inspection, of individual water projects and the preparation of a national water plan.”

Since its creation the PWA has been a channel of funding and a temporary implementing agency for most of the water and wastewater projects. The PWA has been working hardly on proper water resources and project management, in addition to upgrading of administrative, technical and financial management capacity of the institutional and municipal staff. As a result a municipal coastal water utility (MCWU) had been initialized in order to unify the efforts of management and operation in the water sector instead of being not only fragmented between municipalities but also existence of different water quality with a dramatic variety in tariff. This MCWU through a support from PWA is preparing currently for the creation of a private operator, keeping in mind that still the MCWU as a public body will be the owner of assets. Upon performing this step, PWA will work on its mission as an economical, technical and environmental regulator.

The Gaza Strip is divided in five governorates. In terms of management and operation of the water and wastewater services, the five governorates include sixteen municipalities and nine village councils or local utilities (see Figure 1).

THE PROJECT MANAGEMENT TOOLS USED CURRENTLY

At normal circumstances the available staff at PWA carries out the required contacts and technical and planning discussions with the donor representatives and agencies. They prepare from the beginning most of the scope of work to be covered under a certain project along with any preliminary studies, discuss the project component and its feasibility for appraisal with the donor missions and conduct necessary terms of reference, project documents and the recursion of consultants and contracting firms. Since the year 1996, PWA made its best to transfer its experience in the field of services management to the municipal staff.

When the project becomes a reality according to the strategic plans conducted by or through the PWA, upon finalization of implementation of the project it is usually handed over to the concerned municipality to be responsible for the operation and maintenance under monitoring of PWA staff. Few municipalities have the required tools for the operation and maintenance in terms of availability of well trained staff and equipment. In most cases a municipality does not have the minimum requirements to operate and maintain the project. This means that there is no staff available and/or there are no equipment and materials to facilitate their mission. In most cases the support of PWA is required. The actual assets of the different municipalities in terms of staff and equipment are shown in table No.1, which reflects a fragmented capacity that can perform nothing in its existing form. Thus restructuring of these tools supported by some specific training is a must to carry out the operation and maintenance in addition to management of projects not only for emergency conditions management but also during the daily routine of operation.

Upon reviewing the available staff experience and equipment summarized in Table 1 it has been found that there is a fragmented and incomplete capacity to run and manage water projects not only under emergency conditions but also under usual conditions. The reasons behind that can be summarized in the followings:

- Lack or complete absence of well trained staff in most of the municipalities and almost in all of the village councils.
- Lack or complete absence of the most essential equipment in most of the municipalities and village councils.
- Lack of effective training programs for the staff since it became usual to manage the water project by another agency (e.g. PWA) and handing it over to the municipality upon completion.
- Lack of financial resources that enables a municipality or a village council to hire equipment especially in emergency cases.
- Lack of cooperation among municipalities and village councils.

PROJECT MANAGEMENT OBSTACLES

Currently, the Palestinian National Authority (PNA) does not have a perfect control on borders. In addition, the construction of the sea port in Gaza has not started yet. The interference of the Israelis in cases of whatever political conflicts are small results in the freezing or suspension of almost all aspects of life including activities in the water sector. This interference is not guaranteed to be stopped even in case of reaching a final political agreement. Since most of the funds for water and waste water are being managed or monitored by PWA, PWA has so many contracts that can be affected managerially, technically and financially by the Israeli interference. This can be summarized in the following points:

- When budget allocations are in the form of grants from the donor countries, materials required for works are generally conditional to be supplied from the donor country. Usually those materials should be tax exempted by the Israeli authorities (donors do not cover taxes). This can be faced by delays in processing of documents required and at the Israeli ports.
- When budget allocations are in the form of loans from the donor countries, materials required for works can be supplied internationally or from the Israeli market. Usually when borders are closed such materials are prevented from entering Gaza Strip. So, in both cases the situation at Israeli borders will have a direct effect on the availability of materials.
- The physical existence of the Israeli settlements and the Israeli security zones makes it easy for the Israelis to cut Gaza Strip in disconnected areas which can reach four parts though being a small area as a whole. This means inability of staff, equipment and materials to reach the target sites of work.
- In most cases the schedules of work are not satisfied which reflects a delay in progress and hence interference between different activities which may cause a delay to an activity not directly affected by the above factors (e.g. some road works, power, telecommunications,...etc) covered by other agencies.
- Occurring delays result in additional costs to be encountered by the implementing agency due to claims that can be raised by suppliers and construction contractors under force major conditions. Having no additional financial sources to cover those damages, the implementing agency will spend additional time and effort in negotiations with the donor and the supplier / contractor/ consultant.
- Additional costs will be met by the implementation agency to cover extra expenses of its own staff due to additional time for completion of works.
- As a requirement for donors, most of the projects should have some studies available (e.g. Feasibility study, environmental impact assessment,...etc) for the purpose of fund approval. Usually the cabinets or boards of donors who approve the commitment of funding are held at certain fixed dates during the year. Failure to have the required study on the correct time means a delay in commitment for funding to the next cabinet or board meeting on the assumption that the study will be available by that target date.
- The most important from an economical and a social point of view is the effect of the closure of borders on unemployment. In cases of a complete closure of borders unemployment reaches 50%. In terms of figures this means the necessity

to make available about 150,000 temporary job opportunity in a country isolated from the world and having very limited resources.

SAMPLE DAMAGES DURING A TYPICAL PERIOD

Taking as sample the period starting from October, 2000 when a wave of political conflict started, the water sector and especially the ongoing projects have been suffering a lot of damages. Most of these damages can be translated money wise .It varies from claims to be covered under force major conditions to direct costs encountered by the implementing agencies to additional delays in progressing with some projects due to the relation between the project and the weather or the project and the cabinet meetings of the donor country. Table 2 summarizes the main ongoing projects and the effect of such situation on performance and costs.

It should be indicated that only the direct and foreseen costs encountered are considered such as claims or salaries. Of course, there will be additional unforeseen costs encountered which can be more serious especially on the long term. As an example the case of a delay in starting a waste water treatment project means additional damages to the aquifer in terms of pollution in addition to the costs encountered by the residents to evacuate their septic tanks. A second example is the costs encountered while a storm water drainage and infiltration system is delayed. This means delay in harvesting the storm water and recharging it to the aquifer which is again additional deterioration of the aquifer, in addition to the problems caused by flooding. A third example is the delay of construction of a sea water desalination plant which can reduce upon completion the quantity of water abstracted from the aquifer and provide a less cost drinking water than the bottled water which a lot of people became used to purchase.

PROPOSED MANAGEMENT PLAN

As indicated above the actual municipal service management is inadequate. Thus the PWA strongly supports establishment of Coastal Municipal Water Utility, which will give a sustainable tool of management for services in the long run.

It is clear that there is a need for restructuring, development and upgrading of the existing tools to be able to work under emergency conditions such as the closure of Gaza Strip or the closure between different cities in Gaza Strip, in addition to supporting the regulatory role of the PWA on the water projects in future. This will become an urgent need when starting the application of the National Water Plan estimated at 609 MUS\$ for the coming 5 years and 1500 MUS\$ for the coming 20 years.

The concept of restructuring, development and upgrading of the existing tools will be based on the following points:

- Based on the political map of the Gaza strip indicated in Fig #1 the Israeli closure and separation of Gaza Strip cities and villages can lead to dividing the Gaza Strip in 4 parts. The worst scenario is to consider the 5 Governorates of Gaza Strip as 5 separate divisions which works well with the political map under the Israeli policy of separating cities and villages and any other similar cases.
- Selected 5 working groups(see fig No.2) to be combined from PWA ,municipalities and MCWU by utilizing the most experienced staff in project management and human resources management. Five regional coordinators for the 5 Governorates who can coordinate closely between the municipal teams and the PWA head quarter in Gaza will be required.
- The application of a short term (1 month) specific training program on project and human resources management for the working groups as required.
- To schedule a procurement program for materials based on the national implementation plan of the water national plan (WNP) making available materials required for progressing works of at least 6 months.
- To facilitate some incentives for the working groups.
- To make available the most urgent but not costly equipment in the 5 working groups.
- To facilitate renting equipment by the 5 working groups.
- Usually such situations result in increasing the unemployment especially with labors and experienced workers. A possibility of keeping some allocation to hire part of them in direct labor jobs will contribute in solving another social problem through job creation.
- The central emergency project management unit is to be kept at the PWA headquarter and coordination will be through the 5 regional coordinators by telefax and emails. All the working plans and procurement or rental arrangements for materials, equipment or staff will be prepared at the headquarter office and forwarded to the regional coordinator for application with the working group. Each working group (see Table 3) will include from the municipalities or the MCWU two civil experienced engineers, one experienced mechanical engineer, one experienced electrical engineer, Surveying team, accountant, electrical technician, Mechanical technician, civil works technicians in addition to 5 workers. The number to be involved will depend mainly on the nature of activity, the extent to which part of the emergency management unit can be available and degree of urgency to complete a certain job. This will be determined by the steering committee of the emergency project management unit :

The steering committee itself will be formulated from a high level staff representing head of PWA, members of the MCWU board and a technical member representing the emergency project management unit.

It should be indicated that the proposed structure and mechanism of work will not replace the involvement of the private consulting and contracting firms for design and implementation. It is more likely will give flexibility in managing projects implementation in cases where already contracts are signed with the private sector. In such cases, when the contractor is totally or partially unable to progress in works, the

proposal will give him the chance to be supported by the managing group in finding the followings:

- Available supervisors in cases of closures within the Gaza strip.
- Available materials in cases he is planning to import materials from outside the Gaza Strip. For such cases, the contracts need to be formulated as items to be installed in separation from items to be procured, with a flexibility option to use materials from the employer store under certain conditions.
- Some of the equipment will be available with the supervising team and will be rented by the construction contractor at predetermined rates in the contract.
- In cases the contractors' equipment and machinery are totally or partially unable to reach the working site, a provision to be included in the contract will allow the contractor to rent from what is available within the governorate as a geographical area or from other contractors according to predetermined rates. One of the roles to be played by the working groups is to coordinate for the contractor with the governorate and other contractors. Fortunately, in Gaza Strip there are 58 construction firms distributed all over the country. A lot of them have the minimum necessary equipment and machinery that may be required for construction of water distribution network, Sewage collection systems, earth works, drilling of water wells and civil engineering constructions in cases of civil works for pumping stations for water and waste water.

In cases of small works such as small water distribution systems, small sewage collection systems, simple civil works where there are no contracts already signed between the employer and a contractor, the working group will be able to proceed as far as they have the supervising staff, part of the equipment and machinery is available, the other part to be rented from one of the construction firms, materials available in stores, ability to hire the required manpower.

CONCLUSIONS AND RECOMMENDATIONS

1. The Gaza strip is suffering a lot during any political conflicts with Israel, which create a number of obstacles negatively affect particularly the implementation of water projects and the implementation plan of the water national plan. To deal with such problems a practical emergency plan should be utilized. The proposed management plan can easily manage the system during any emergency conditions, in addition to be used as support to the regulatory role of the PWA to the water sector in the Palestinian territories and in particular in the Gaza Strip.
2. The proposed management plan depends mainly on creating working groups consisting of the available PWA, CMWU and municipal staff to decrease the operational cost as much as possible.
3. The working groups will be of the best 55 staff members to be contributed so that they cover the needs of the whole Gaza Strip areas. Out of this number a total of 24 members need additional skills through intensive and specific training courses. Proposed training can focus on planning and scheduling, improving productivity and performance, human resource management and management of construction

materials and decision support system. Nine (9) staff members need to be recruited in order to have complete professional teams. More attention to be paid more to the middle area municipalities. The average salary for each member with the required level of experience is \$1200 monthly. Training programs required will cost \$50,000.

4. The cost of purchase of machinery is high keeping in mind that machinery and equipment owned by the local contractors will be almost idle under hard circumstances. It will be more feasible to rent such equipment and machinery. A total budget to be allocated for this purpose is estimated at MUSD 3 according to the annual size of projects based on the implementation plan of the water national plan. This represents 5% of the value of projects for 6 months. It is not necessarily that the whole budget be utilized within 6 months but it gives allowance for working completely under emergency for 6 months.
5. A total additional storage area for materials estimated at 8000 m² is required to facilitate the storage for 6 months. This area can be provided from the governmental land at the different governorates.
6. An allocation for procurement of materials for 6 months duration completely under emergency conditions is estimated at MUSD 36 representing about 60% of the value of projects for 6 months.
7. An allocation for hiring manpower in direct jobs for 6 months duration completely under emergency conditions is estimated at MUSD 12 representing about 20% of the value of projects for 6 months.
8. Calculations are based on 10% profit and running expenses under usual conditions in addition to 5% for engineering works.
9. During project stoppage times a lot of damages result. These damages can be financial, environmental and social affecting not only employers of projects but also the private sector and the residents. Actions must be taken to reduce effects of these damages.
10. Care to be taken while preparing contract documents to allow for the provision of equipment and machinery rent in addition to the rates of the different categories of manpower.

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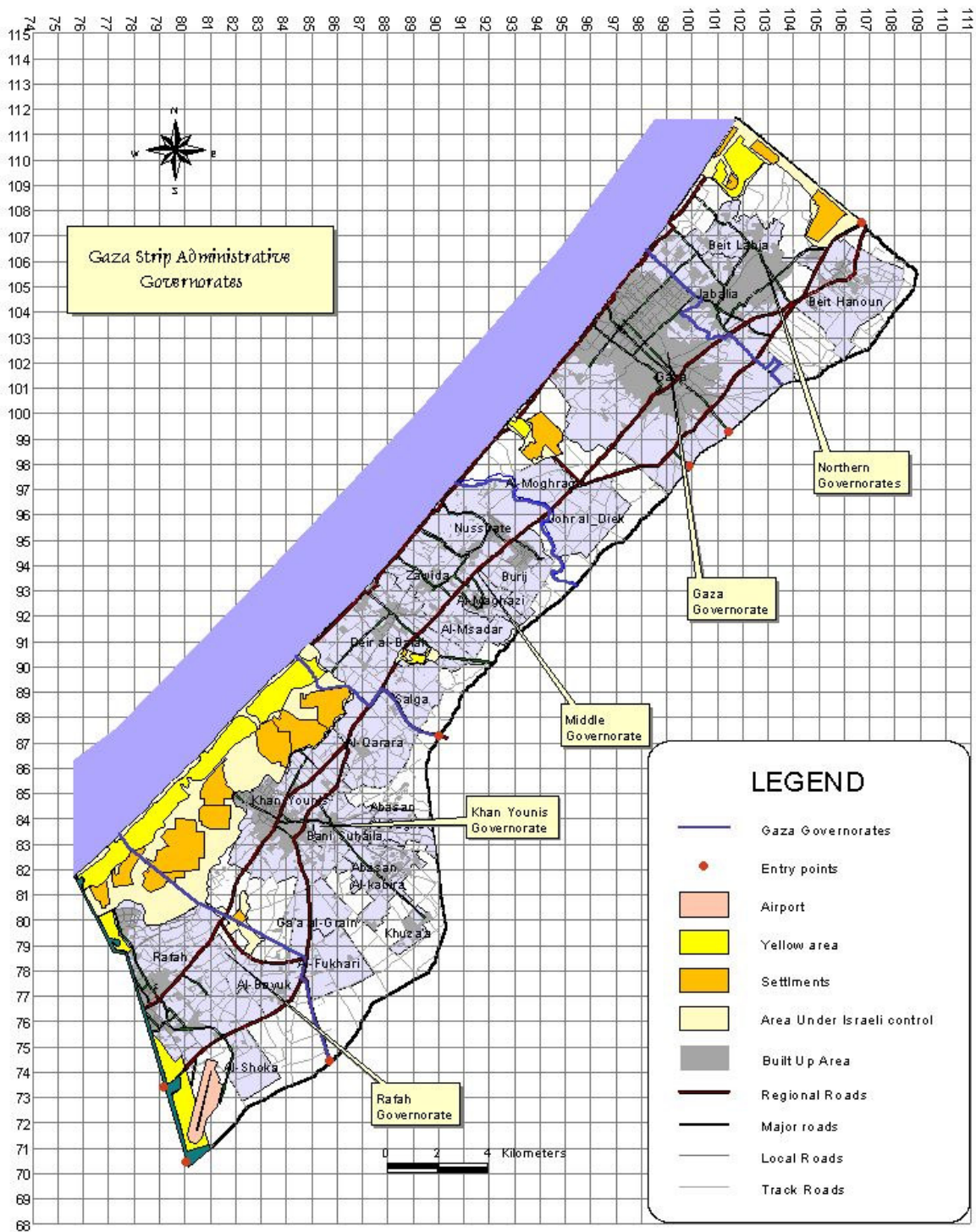


Figure 1 Gaza Strip Administrative Governorates

Table (1) Available Municipal Staff & Equipment

Municipality	D. Cabine/ Pick up	Jetter & Vac	Loader	Excavator	Storage m ²	Eng.	Superv	Plumber	Accountant	Worker	Driver	W. House Keeper
Beit Hanoon	1	1	-	1	1000	1	3	4	2	8	2	1
Beit Lahia	1	1	-	-	1000	2	2	2	1	20	-	1
Jabalia	2	2	1	1	1000	4	6	8	1	16	6	1
Gaza	16	19	8	2	6000	14	95	28	1	41	2	2
Burije	1	1	1	1		1	1	2	1	2	-	1
Nusirat	1	-	1	1		2	1	3	1	2	1	1
Zawaidah	1	-	-	-		1	1	1	1	2	1	-
Maghazi	1	-	-	-		1	1	1	1	2	1	-
Deir Balah	1	-	-	-	1000	4	1	3	1	4	1	1
Khanyounis	1	5	-	1	500	6	3	7	1	23	5	-
Qurara	1	-	-	-	400	1	1	2	1	5	1	-
Abasan Jadida	1	-	-	-		1	1	1	1	2	1	-
Abasan Kabera	1	-	-	-	180	2	1	3	1	4	1	1
Khza'a	1	-	-	-		1	1	1	1	2	1	-
Bani Shila	1	3	-	-	300	3	7	2	1	1	1	2
Rafah	3	4	2	-	600	6	11	11	1	12	4	-
Shoka	-	-	-	-	-	1	-	-	1	-	-	-
Bayyok	-	-	-	-	-	1	-	-	-	-	-	-
Fakhari	-	-	-	-	-	1	-	-	1	-	-	-
Mograga	-	-	-	-	-	-	-	-	1	-	-	-
Wadi Gaza	-	-	-	-	-	-	-	-	1	-	-	-
Mosadar	-	-	-	-	-	1	1	-	1	-	-	-
Wadi Salqa	-	-	-	-	-	1			1	-	-	-
Bedwin Village	-	-	-	-	-	-	-	-	-	-	-	-
Zahra	-	-	-	-	-	1	-	-	1	-	-	-

Table (2) Effects of closure of Gaza on the ongoing water projects

Project	Effects of closure	Estimate of damages USD
Extension of the service improvement project in Gaza strip	1. Requirement for extension of additional 4 months as salaries and overheads for the operator.	360,000
	2. Requirement of additional 4 month salaries for PWA staff involved and PWA overheads. In addition there will be an unseen Delay of 3 months in starting the private sector operation contract with the MCWU and hence additional damages to municipalities during this additional period.	80,000
Improvement of water infrastructure in Gaza	1. Compensation expected for suppliers due to blocking of materials in the Israeli port	115,000
	2. Compensation expected of the local contractors for extension of 4 months and changes of unit rates of construction materials.	30,000
	3. Compensation expected of consultant for extension of 4 month	20,000
	4. Requirement of additional 4 month salaries for PWA staff involved and PWA overheads.	24,000
Construction of the first phase of north Gaza sea water desalination plant	1. Compensation expected for the contractor on having foreign and local staff while no performance due to unavailability of materials.	65,000
	2. Damages to the works under construction due to Israeli pullets.	50,000
	3. Requirement of additional 4 month salaries for PWA staff involved and PWA overheads.	15,000
Construction of the first phase of Gaza middle area sea water desalination plant	1. Compensation expected for the local contractor against overheads and additional insurance and securities, staff and difference of rate of construction materials.	35,000
	2. Overestimated offers for international electromechanical contractors due to the feeling of high risk factor.	250,000
	3. Requirement of additional 4 month salaries for PWA staff involved and PWA overheads.	10,000
Development of a storm water drainage system in Khanyounis area	1. Contractors and consultants released or kept partially their staff due to inability to start as an effect to the political situation.	45,000
	2. Compensations due to extended insurance and securities.	50,000
	3. Requirement of additional 4 month salaries for PWA staff involved and PWA	

	overheads.	15,000
Development of sewage treatment and collection in Khanyounis area	A final appraisal to be raised to the donor cabinet is delayed. This will create additional 6 month of delay to start. Additional costs met by residence to evacuate cesspits are estimated. Additional costs against the damage of the aquifer are not calculated	500,000
Comprehensive study for the problem of effluent flooding of existing North Gaza WWTP	This component though small, the delay results excluding the commitment to finance a 6 MUSD project by the donor board in the coming meeting. Such commitment will be delayed for additional 6 month. This means additional temporary works to protect people from flooding. Additional costs against the damage of the aquifer are not calculated.	25,000
Coastal aquifer management plan	Few tasks were delayed or suspended. 1. Overheads of the main contractor (salaries , offices, equipment...) during 4 months 2. Expenses of PWA staff involved and overheads	92,000 30,000
North Gaza sewage and storm water drainage system	Projects under construction have been delayed or retarded. Consultancy contract for the design of WWTP has been delayed. Additional costs to be encountered for more damage of the aquifer are not estimated. 1. Contractors and consultants released part of their staff due to inability to start as an effect to the political situation and kept another part either partially or completely. 2. Additional costs met by residence to evacuate cesspits. 3. Expenses of PWA staff and foreign staff involved and overheads.	50,000 100,000 80,000
Waste Water infrastructure funded by loan from the EIB	1. Additional interest against the delayed period. 2. Contractors and consultants released or kept partially their staff due to inability to start as an effect to the political situation. 3. Additional costs met by residence to evacuate cesspits. 4. Expenses of PWA staff and foreign staff involved and overheads.	150,000 50,000 500,000 100,000
Water projects run by other agencies(PECDAR, ANERA, CH, Save the children,)	Almost all the water projects components run by such institutions have been stopped for a period of 4 month due to unavailability of materials and inability to reach sites. Those institutions have been keeping their staff, rental of offices and running costs.	300,000
Development of municipal services in the middle area	Consultancy cost, management costs and expected contractors' claims.	220,000

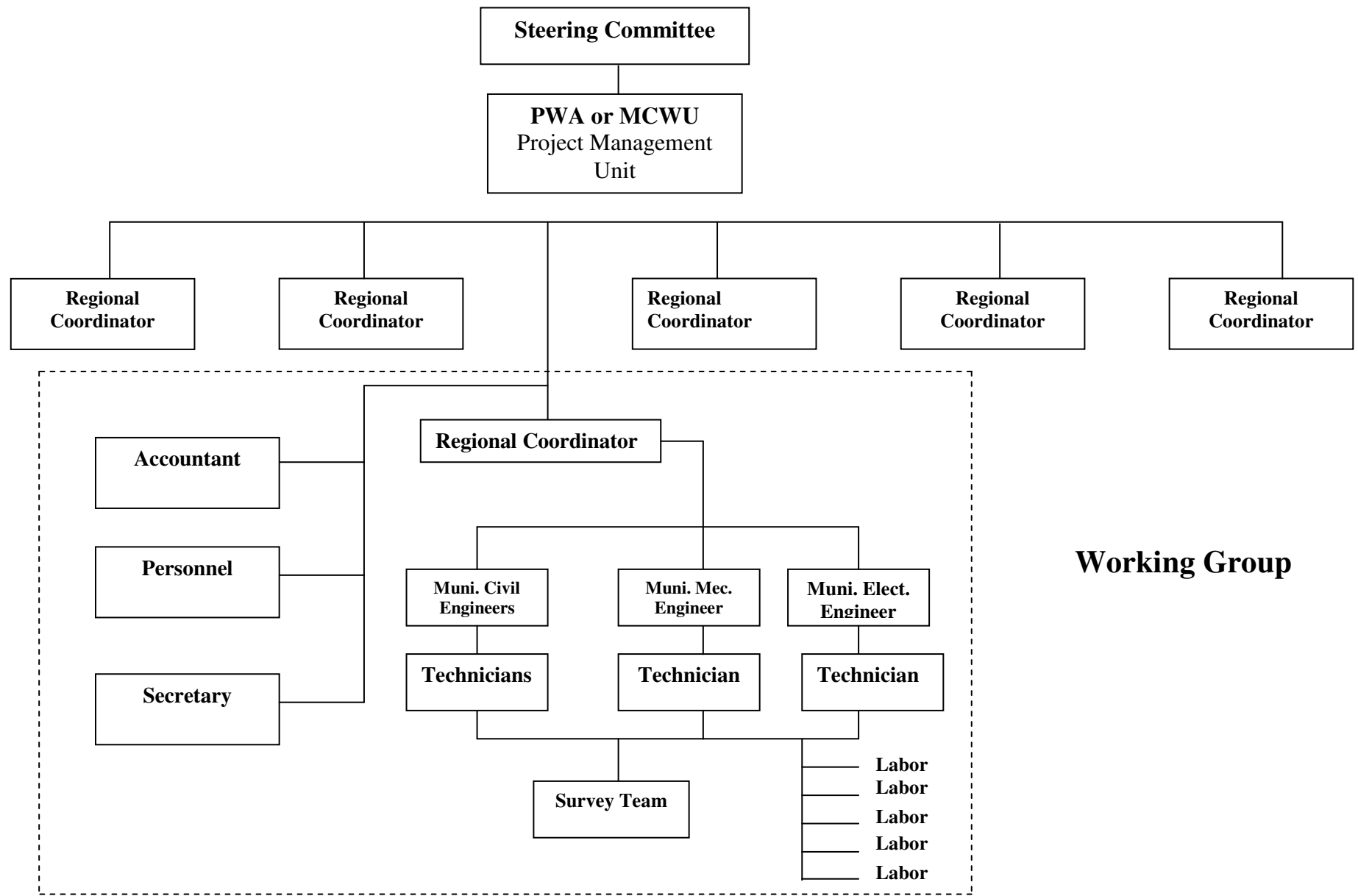


Fig. 2 Proposed Structure

Table 3 Revised Technical Capacity

Governorate	Coordinator	Civil Eng. (1)	Civil Eng. (2)	Mech. Eng.	Elect. Eng.	Civil Tech.	Mech. Tech.	Elect. Tech.	Survey Team	Accountant	Personnel	Storage	
												Available m ²	Additional Required m ²
North	AT	A	AT	A	AT	NA	AT	AT	AT	A	AT	3000	2000
Gaza	A	A	A	A	A	A	A	A	A	A	AT	6000	0.0
Middle	AT	A	AT	NA	NA	NA	NA	NA	AT	A	AT	1000	2000
Khanyounis	AT	A	A	AT	AT	NA	AT	AT	A	A	AT	1400	1600
Rafah	AT	AT	AT	A	AT	NA	NA	AT	A	A	AT	600	2400

A: Available with relevant experience

NA: Not available

AT: Available with irrelevant experience, needs, training