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Palestine

Water as a human right:

The understanding of water in Palestine

By Dr. Karen Assaf

ASIR – Arab Scientific Institute for Research and Transfer of Technology, Palestine

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The understanding of water in the Arab countries of the Middle East – A four country analysis
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Summary

Throughout the Middle East, there is a gap between water supply and water demand. In Palestine, this gap is growing with time because water supply is artificially constrained. This gap is having severe adverse effects on both current and future Palestinian socio-economic development.

Water is essential to human life — for basic health and survival, as well as food production and economic activities. Yet Palestine is presently facing a national emergency in that there is a lack of access to a basic supply of clean water and access to adequate sanitation, the primary cause of diseases linked to water – as well as a potential source of contamination to the water resources themselves.

This study presents the current situation in the water sector in Palestine, along with the water sector policy and strategy, and existing legislation. The criteria for the Human Right to Water are then considered. It is concluded that closing the water gap in Palestine will be totally dependent on the development option and on that action plan that is best able to be implemented in the current political and economic situation.

1 The national water sector

Records show that pre-1948 Jewish and Palestinian communities in the region were consuming similar quantities of water for both domestic and agricultural purposes. Since the establishment of the Armistice Line in 1949, Israel commenced restrictions on the development of wells in the area under Jordanian administration, specifically in the West Bank area, which impacted on the shared North Eastern and Western aquifers. In parallel with these restrictive actions, Israeli exploitation of water resources accelerated and the water consumption gap between the Israelis and the Palestinians started to widen. In 1964, Israel took advantage of its control over much of the headwater area without recognition of other riparian users' needs or rights in the Jordan River Basin when it implemented the first "out of basin" transfer (National Water Carrier System) of the Jordan River waters to the Negev and southern coastal areas of Israel.

After 1967, with the annexation of the Golan Heights and the occupation of the West Bank, Israel increased its control over both the headwaters and the lower Jordan River. This control was further extended with the invasion of Southern Lebanon in 1978 and the establishment of the "security zone" – which was returned to Lebanon in May 2000.

Further exploitation of the resources of both the upper and lower reaches of the Jordan River continued over this period with total disregard for other riparians until the Peace Treaty with Jordan in 1994.

Meanwhile, colonisation of the West Bank and Gaza was carried out by the construction of settlements. These settlements, in addition to utilizing a disproportionate part of the available aquifer, discharged untreated domestic, agricultural and industrial waste into nearby valleys, resulting in significant harm to the environment.

Post-1967 actions were also effected to close some Palestinian wells and to place restrictions on pumping accompanied by restrictive controls by means of licensing, application of fixed operating quotas and refusal of permission to deepen wells.

Progressive desertification has also taken place in the West Bank and Gaza due to the reduction of available grazing area by 50% mainly as a result of the acquisition of land for settlements, military camps and "nature reserves". Forestation programs in the West Bank and Gaza that existed during the British Mandate and Jordanian Administration were stopped under the Israeli occupation and a 25% effective deforestation has taken place over 30 years, mainly due to the establishment of the Israeli military camps and settlements.

The entire period from 1967 to the present day was accompanied by the degradation of existing infrastructure and limited development of new infrastructure for water supply, sewerage and solid waste. This resulted in insufficient supply and unreliable service together with poor quality and with large losses in the systems. The Israeli "operator" also cut off supplies periodically, thereby discriminating unfairly between Palestinians and Israeli settlers when shortages or problems occurred (especially during periods of drought).

Consequently, the gap in water consumption between Israel and Palestine has widened from a similar utilization in pre-1948 to the more than three times differential that exists today. The differential in water use between Israeli settlements and Palestinians is even more marked, being in the order of five to six times. Not until the Declaration of Principles in 1993, ratified by the Oslo II Accord in 1995, did the principles of equitable utilisation and the shared management of regional resources between Israel and Palestine get official mention and hopefully these principles will again become part of the negotiating agenda in the future. Effectively, Oslo II – as in the Interim Agreement – only permitted a relatively small increase in the utilisation of water resources by Palestinians and otherwise agreed (referred to) to a status quo on other abstractions.

However, it must be stated that the situation has worsened since the current Intifada. Quantities of supply are still deficient (controlled) and in many localities it is necessary to purchase water for domestic use from water tankers at high prices, 5-6 times that of piped water from public utilities (Shalabi 2003). The bottom line is that sufficient and reliable water services in the West Bank and Gaza Strip are affected negatively by the continuing water shortage.

1.1 National macro-economic setting and development objectives of Palestine

Historical/geographical Palestine is located on the eastern edge of the Mediterranean Sea, with the countries of Lebanon and Syria in the north, and Jordan to the east. It had a total land area of 26,323 square kilometres. The West Bank of Palestine (the inland region) is 5,655 square kilometres and is 130 kilometres long and ranges from 40-65 kilometres in width. The Green Line border between Israel and the West Bank is 307 kilometres long, and the eastern border with Jordan is 97 kilometres in length.

The Gaza Strip of Palestine (the coastal region) is 365 square kilometres and is 45 kilometres in length, and from 5-12 kilometres in width. The Gaza Strip has a 62 kilometres coastline, and a 51 kilometres border with Israel, and 11 kilometres with Egypt. (ESCWA/FAO 1985, UNEP 2003)

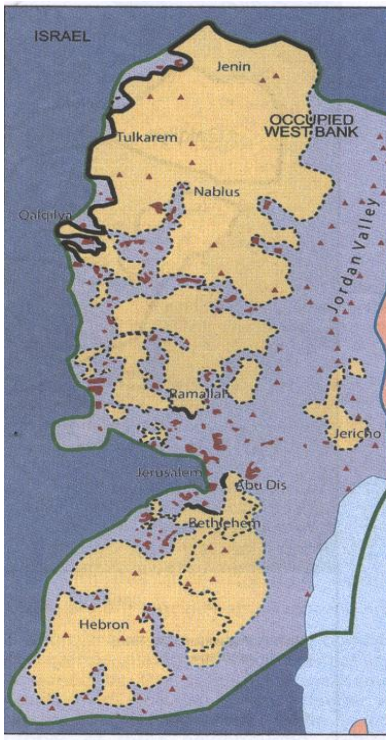
A picture is worth a thousand words. Below, Map 1 depicts historical or geographical Palestine, with a line illustrating the "Armistice Line" in 1948, and the spots indicating the areas that are supposedly under Palestinian control – based on the Sharm el-Sheikh Memorandum as of March 2000 – i.e., 21.7% of the "Armistice Area" and 5% of historical/geographical Palestine.

Map 2 shows the status of the West Bank portion of Palestine in November 2003. All of the West Bank is essentially Israeli controlled – with the yellow coloured areas having different degrees of Israeli presence. Map 3 shows a picture of the Wall (Separation fence) that is being constructed by Israel and which has again altered the geographical face of Palestine – and at the same time has significantly affected the availability and accessibility to water resources. To-date, this Wall has put another 15% of the West Bank land on the "Israeli" side – home to 274,000 Palestinians, with at least another 326,000 who will be affected by being separated from their lands or schools or health care services – not to mention family and friends.(Jarrar et al. 2003)

With regard to water resources, the Wall is blatantly meant to insure Israel's complete control over Palestinian water resources. The positioning of the Wall has now put Israel in complete control of the Western Aquifer Basin and has eliminated any

opportunities for Palestinians in the future to develop or extract any water through drilling wells in productive areas, as defined by geological structures. The Wall even now physically controls about 40 existing Palestinian wells (over 5 MCM/year) that were located in agricultural lands in the Western Aquifer Basin alone. This is nearly one fourth of the entire current Palestinian usage of the Western Aquifer Basin (WAB) (22 MCM/year). In comparison, Israeli abstractions from the WAB increased up to 544.8 MCM in 1998-99 (decreasing somewhat in 2000 and 2001) (SUSMAQ 2003). It is noteworthy that the sustainable yield of the Western Aquifer Basin has always been quoted as being 400 MCM/year.

Map 1: Palestinian controlled Areas – March 2000



Map 2: The West Bank November 2003

Map 3: The Gaza Strip

The Wall in Abu Dis
January 2004

The Wall near Qalqilia
January 2004

Currently, in 2004, the two remaining pieces of historical /geographical Palestine have a projected population of 3.6 million, with 2.3 million in the West Bank and 1.3 million in the Gaza Strip. These populations are based on a 1997 census that was taken by the Palestinian Central Bureau of Statistics. The overall natural increase or population growth in Palestine is 3.5%, based on 3.2% in the West Bank and 4.0% in the Gaza Strip. The Gaza Strip may be the most densely populated region in the world with over 3,600 persons per square kilometres in 2003. The West Bank has 407 persons per square kilometres.

Population increase is the fundamental parameter affecting future water needs. This determines not only municipal demand, but also agricultural demand (to feed the population) and industrial demand (to provide an economy to support the economic development of the population).

In Palestine as a whole, more than 50% of the population lives in an urban environment, 28.5% in rural areas, and 15% in camps. In addition to the 3.6 million Palestinians 'in' Palestine, there are over 4.5 million Palestinians living outside, mostly in other Arab countries. There are also another 1.5 million Palestinians living inside Israel, as Israeli citizens. (Shalabi 2003, UNEP 2003).

The climate in Palestine is classified as Mediterranean with hot, dry summers and short, wet, and cool winters. The temperature and rainfall vary with altitude within the five distinct climatic areas – the coastal region of Gaza, the semi-coastal fertile plains

of the West Bank, the hilly chain or central highlands, the Eastern slopes, and the Jordan Valley.

Strength and weakness

The remaining (and growing) population of Palestine essentially has little control and obvious restricted access to its national water resources. Palestinian water rights have not been defined.

1.2 Palestinian water policy and strategy

The elements of a Palestinian Water Policy were stated in a document issued by the Palestinian Water Authority in January 1996. The Palestinian water policy, as set out in the following principles, was to be the basis for decisions on the structure and tasks of water sector institutions and the water sector legislation. (Palestinian Water Authority 2003a, PECDAR 2001, SUSMAQ 2003)

All sources of water should be the property of the state.

Rationale: In a situation of acute shortage of available water resources, a just, equitable and sustainable allocation among all legitimate users may be best ensured by the state. To this end, all well drilling, water production and supply should be allowed only by permit or a license. It should be noted that unlicensed drilling still occurs, predominantly in Gaza and the northern West Bank.

Water has a unique value for human survival and health, and all citizens have a right to water of good quality for personal consumption at costs they can afford.

Rationale: The right to water for survival is seen as a universal human right. However, individual water rights do not necessarily imply free access to water supply or disposal services. Standards for assuring a safe quality of drinking water, and for water supply must comply with resource assessment based on scientific methods. The words "and of sufficient quantity" should be added to this statement.

Domestic, industrial and agricultural development and investments must be compatible with the water resource quantity available.

Rationale: An important means to meet this goal is consistency between national economic planning and the national water policy. Economic development should not imply, even inadvertently, unsustainable water use or irreversible environmental damage. The regard for resources and environment should lay the bases for the economic solutions. The role of agriculture is particularly important in the economy of the Palestinian territory, and the major share of water resources are being used for agricultural purposes. Water consumption in the agricultural sector will have to adjust on a cost-efficiency basis, with due consideration to issues such as issue such as choice of cultivars, use of marginal-quality water, and improved irrigation technology. Domestic uses occupy the first priority in the allocation of potable water resources.

Water indeed is an economic commodity, therefore the damage resulting from the destruction of its usefulness (pollution) should be paid by the party causing the damage (polluter).

Rationale: Sustainable management of water as a scarce resource is only possible when its full cost is acknowledged during the planning and development of water

projects. Pricing policy may, however, have to be made so as to provide drinking water to poor parts of the population at an affordable price.

Water supply must be based on a sustainable development of all available water resources.

Rationale: In this context, available resources include sharing of regional water resources, recycling, reuse, rainwater (and storm water runoff) harvesting, use of marginal-quality water, and unconventional sources such as desalination. Sustainability in the context of Palestinian water resources means, in particular, long-term maintenance of groundwater levels, water pollution prevention, more efficient use of marginal waters, and rainwater (storm water runoff) harvesting.

The development of the water resources of the Palestinian territory must be coordinated on the national level and carried out on the appropriate local level.

Rationale: The scarce and limited resources of catchments and aquifers must be managed in their entirety, preventing upstream overuse to the detriment of downstream users. This is best achieved through overall coordinated actions, complemented by local implementation, together with proper measurements, monitoring and recording of all water production and use.

The national water sector management should be carried out by one responsible body with the separation of institutional responsibility for policy and regulatory functions from the service delivery functions.

Rationale: The water resources of Palestine are of such overriding importance for human welfare and the national economy that water matters should be dealt with at the highest level within the government for effective coordination of sectorized interests. The Palestinian Water Authority should carry out its activities in close collaboration with relevant sectorial authorities.

Public participation in water sector management should be ensured.

Rationale: Local participation in planning, operation and management is one key to ensuring proper management of water demand. Public awareness of the role of water in both the public and private domain and its social, environmental and economic value is important for informed decision-making.

Water management at all levels should integrate water quality and quantity.

Rationale: Usable water is always a function of both quality and quantity and the two are strongly interconnected. Disregard of this fact is disastrous, and has, for example, led to saltwater infiltration from the Mediterranean into Gaza. Integrated water management should include monitoring and other data collection.

Water supply and wastewater management should be integrated at all administrative levels.

Rationale: Water consumption will inevitably lead to spill or sewage. The economy and technology for managing both water supply and sewage can be optimised by an integrated approach. Moreover, in some circumstances, wastewater as well as storm-water drainage is a potential resource for raw water supply.

The optimal development of water supply must be complemented by consistent water demand management.

Rationale: Use of appropriate technology should be encouraged in water-saving practices, both in households, industry, and above all in agriculture. Pricing policies are important tools for managing water demand and must be a part of the overall water policy. In this context, it is also essential to modernize surface and groundwater monitoring systems.

Protection and pollution control of water resources should be ensured.

Rationale: In this context, all preventive measures against pollution should be ensured and legal actions against offenders should be taken. For example, industrial waste should be treated on-site and then discharged to the wastewater network. Areas of good water quality should be protected and safeguarded against pollution and major development projects.

Conservation and optimum utilization of water resources should be promoted and enhanced.

Rationale: Water resources should be developed and managed to optimise the efficiency of their utilization, recognizing their scarcity, the need for their conservation and the importance of pricing to promote economic efficiency.

The Palestinians will pursue their interests in connection with obtaining the right of water resources shared by other countries.

Meaning: The Palestinians were committed to implement Article 40 as agreed upon with the Israelis in Oslo II (an Interim Agreement). This also stresses the fact that the Palestinians will negotiate with the Israelis in the final stage to reach a final agreement. Accordingly, the Palestinians will seek other agreements with other countries.

The government will cooperate with regional and extra-regional parties to promote the optimum utilization of water resources, to identify and develop new and additional supplies, and to collect and share relevant information and data

Meaning: Regional co-operation should include sharing of information and data on water resources and promotion of regional seminars, meetings and publications. The Palestinian government will cooperate on regional initiatives to identify likely sources of new and additional water supplies and agree on the development of such resources. (It should be noted that the "sharing of information" stage still has not been reached – neither bi-laterally nor even between institutions in Palestine.)

Based on the above Elements of a Water Policy, the National Water Policy for Palestine has been formulated by the Palestinian National Authority to address the increasing scarcity of water resources in Palestine and the political complexity in relation to this valuable resource. This policy contains the above outlined points and principles for governing policy and planning for the water sector in Palestine. When drafting the Palestinian water strategy, the above points were summarized and re-prioritised to capture the most important issues and strategic interventions to be considered when developing water resources for supply purposes, e.g.:

- Pursue Palestinian Water Rights.
- Strengthen National Policies and Regulations.
- Build Institutional Capacity and Develop Human Resources.
- Improve Information Services and Assessment of Water Resources.
- Govern Water and Wastewater Investments and Operations
- Enforce Pollution Control and Protection of Water Resources.
- Promote Public Awareness and Participation.
- Regional and International cooperation.

Overall objective:

Equitable and Sustainable Management and Development of Palestine's Water Resources

Ultimate goal:

To find the optimal way to manage, protect and conserve the limited water resources.

Mission:

To maximise benefit from resources by raising water consumption to levels that provide for safe health and economic prosperity.

Strength and weakness

Thus, the basis for a Palestinian water policy and strategy have been drafted and studied – and different scenarios have been formulated. The institutional and regulatory framework for water resources management in Palestine has been set up. However, there is a never-ending need to cope with growing demand, deteriorating quality and conflict between user categories – while always having to deal with the issues of water rights, between neighbouring countries. The needed approach to completion and implementation of the Palestinian Water Management Strategy is the one that will build the capacity of local utilities and promote ownership, commitment and awareness not only in local institutions – public, private, non-governmental- but also more directly to the general civil society.

1.3 Water resource assessment: Base and potential - The water resource gap

Throughout the Middle East, there is a gap between water supply and water demand. In the Palestinian Territories, this gap is growing with time because water supply is artificially constrained by the stagnation of the peace process. This gap is having severe adverse effects on both current and future Palestinian socio-economic development.

There is a great deal of uncertainty regarding the quantity of cheap, locally accessible water that will be available for future Palestinian use. For example, the utilization of 'national' groundwater resources and the riparian share in the Jordan River system is much cheaper than seawater desalination or water import. This obviously means that ground water and surface water sources from the Jordan River will be exploited first.

More costly water sources, which are often more distant, or otherwise more difficult to obtain, will only be developed at a later date, after cheaper sources have been fully utilized. In the Palestinian case, this issue is related, of course, to how much water will be available to the Palestinians from these resources based on Permanent Status Negotiations with Israel (PECDAR 2003).

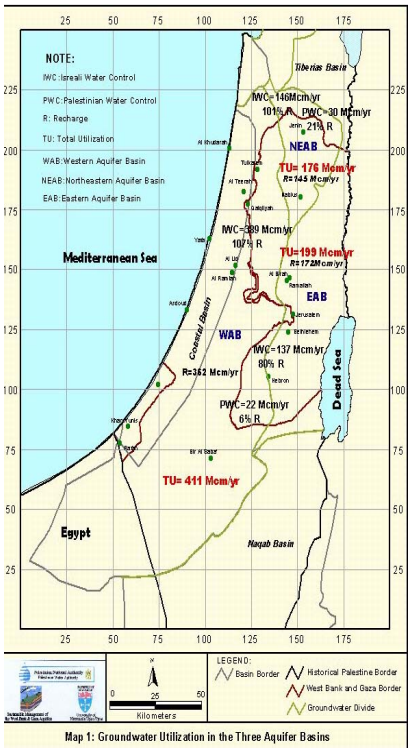
It must also be noted that the groundwater quality of the aquifer in the Gaza Strip has been substantially impacted by vast over extraction in excess of the sustainable yield of the aquifer, by raw wastewater discharges, agricultural water return flow, and salt water intrusion due to the mining of the coastal aquifer.

The fresh water gap in Palestine has to take into account the different water qualities because at times water from a certain resource cannot be used for a certain demand sector. For example, water from treated wastewater or harvesting of storm water cannot be used for domestic purposes.

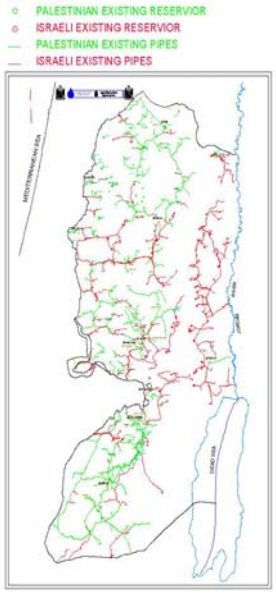
Strength and weakness

Obviously, closing the water gap will be totally dependent on the development option and the action plan best able to be implemented due to the current political and economic situation. There is restricted access to national water resources. The following diagram and maps show clearly the control of water resources of the West Bank – as well as the Gaza Strip:

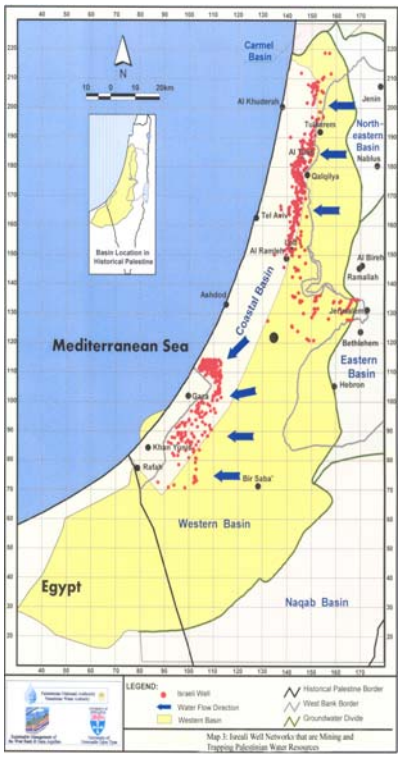
Figure 1: All basins' water



Map 4: Groundwater utilization in the 3 aquifer basins in the West Bank:



Map 5: Existing infrastructure in the West Bank – pipelines and reservoirs, Israel – red lines, Palestine – green lines



Map 6: Israeli wells that are mining the water resources from the West Bank – and before the water resources reach the Gaza Strip

Israel (MCM)	**Palestine (MCM)**
Western	Western
389	22
North-eastern	North-eastern
146	30
Eastern	Eastern
137	22

1.4 Analysis of demand and supply of water

1.4.1 Municipal water demand

Actual municipal water demand

The total water use by the domestic and municipal sectors in the West Bank and Gaza Strip during 1999 is estimated to be 101.3 MCM/Year. An amount of approximately 52.3 MCM/year was used in the West Bank, whereas a total of approximately 49 MCM was used in Gaza Strip. The overall supply rate (including losses) for urban domestic purposes in the West Bank is estimated to vary between 53 litre/capita/d in Tubas and 134 litre/capita/d in Jericho. The overall loss or unaccounted-for-water (UFW) rate is estimated to vary between 25% (in Ramallah) and 65% (in Jericho), with an average of 44% of the total supply. The loss rate in un-piped areas was assumed to be 25%. All localities in the Gaza Strip are considered connected to a water distribution system. The total average use is estimated to be 134 litre/capita/d. The per-capita domestic consumption rate is estimated to be approximately 80 litre/capita/d. However, in the Gaza Strip, the groundwater is of poor quality with only a small percent considered potable. In the Gaza Strip, the overall loss rate is estimated to be about 45%, of which 40% is estimated to constitute physical losses from the system and 5% unregistered connections and meter losses.

The municipal future water demands comprise the domestic, public, livestock, commercial and tourist water needs. The demand projections are estimated based on the WHO standards of 100 litre/capita/d and 150 litre/capita/d as minimum and average domestic water consumption. Other consumption rates (including commercial, industrial and livestock consumption rates) are projected as a percentage of the municipal water demand. Assuming an estimated physical loss rate ranging from 12% to 8% by the year 2010 (PECDAR 2001), the total demand of 302 MCM/year projected for the year 2010 gives a total municipal annual per capita water demand of 69 CM/Year. (The current total annual municipal per capita demand in Israel is around 105 CM/year.) (Assaf and Aliewi 2003, SUSMAQ 2001)

Table 1: Projected municipal water demand in MCM/year

Year	**2000**	**2005**	**2010**
West Bank	127	159	187
Gaza Strip	77	96	115
Total Palestine	204	255	302

1.4.2 Industrial water demand

Due to the constraints imposed on this economic sector in Palestine during the last 34 years of occupation, the industrial sector made only a limited contribution to the overall economic development. Consequently, the existing situation of the industrial sector in Palestine (which consists mainly of light and small industries) does not represent the actual stable industry that could be achieved in Palestine. This implies that the current industrial water demand cannot be utilized for the projection of the future water demands. Types of existing Palestinian industries range between quarries,

food processing and others. It is stated that the present industrial water demand in Palestine represents about 8% of the total municipal water demand. The present industrial water consumption is included in the total current domestic consumption, and it is very difficult to estimate, while the actual industrial water demand is about 16%.

The national vision regarding the industrial sector is the establishment of 9-13 Palestinian industrial estates eight of which are to be distributed among the different Governorates of the West Bank, and four in the Gaza Strip. (Assaf and Aliewi 2003, SUSMAQ 2001)

Table 2: Future industrial water demand

Year	**Industrial demand (MCM/year)**
2000	8.3
2005	41
2010	48

1.4.3 Irrigation water demand

As expected, the major share of water in Palestine is being used in agriculture. The role of agriculture is particularly important in the economy of Palestine due to its high contribution to GDP and its role in employing Palestinian workers. Irrigated agriculture contributes more than 37% of total agricultural production compared to only 24% from rained agriculture (the remaining being field and orchard crops). Agriculture has a major role in national trade, as agricultural products constitute 23% of the national commodities export. Irrigation water in the West Bank comes from groundwater in the form of wells and springs, but only from wells in the Gaza strip.

Note: Wastewater reuse can only be incorporated into the agricultural sector after the time lag needed for infrastructure development, i.e., construction of wastewater treatment plants.

The current irrigation water supply is about 172 MCM/year, about 89 MCM of which are utilised in the West Bank coming from springs and wells. It is important to note that water supplies for irrigation are either shallow, small, old wells or natural springs. Natural springs face the severe problem of discharge variability, and thus these spring sources are not reliable water sources. Although the average discharge of the springs used in agriculture is about 49 MCM/year in the West Bank, this spring discharge is low in dry years and high in wet years. Due to lack of storage structures, large volumes are lost in wet years

In the years 2005 and 2010, annual agricultural water demand has been estimated at 326 and 373 MCM/year respectively, which is roughly double the current irrigation supply. (Assaf and Aliewi 2003, SUSMAQ 2001)

Strength and weakness

The National Water Policy for Palestine has clear statements within which water demand will be developed, but these statements still need to be brought into being. The key statements in this regard are:

- Water has a unique value for human survival and health, and all citizens have a right to water of good quality for personal consumption at costs they can afford – and of sufficient quantity;
- Water is an economic commodity.
- Water supply must be based on a sustainable development of all available water resources.
- Industrial and agricultural development and investment must be compatible with the water resource quantity available, which leads to the following points:
- Domestic/ Industrial water demand must be prioritised with regard to quantity and quality, with the highest priority assigned to domestic uses
- No increase of freshwater supply to the agricultural sector will be considered beyond the current levels; any increase in the agricultural demand for water will be satisfied by reclaimed waste water and maximization of the use of storm water run-off. Any water saving due to upgrading the agricultural water supply system, to modification of agricultural practices, techniques, or cropping patterns, will ultimately be reallocated to the Domestic / Industrial sector.
- Industrial development requiring good quality water supplies will need to be situated near accessible and secure (24 hours/day) supplies.

1.5 Regulatory framework of water law

Listed below is the Palestinian legislation that has been passed in the water sector since the establishment of the Palestinian National Authority: (Assaf 2000, Jarrar etal 2003, Palestinian Water Authority 2003a, PECDAR 2001)

- Decision No.(5) – a Presidential decree - of the Palestinian Authority which was issued on April 26, 1995 to establish a Palestinian Water Authority.
- Bylaw No.(2) Regarding the Establishment of the Palestinian Water Authority, Issued in Gaza City on January 18, 1996 which included the basic functions and authority of the new water authority, and also designated a National Water Council whose responsibility it is to prepare a national water policy, and to make strategic decisions.
- Presidential Decree No.66 in 1997: The Decree established the internal regulations of the Palestinian Water Authority and the rules of procedures.
- Palestine Water Law No.3 passed and on July 17, 2002 by the President: This law includes the institutional framework of each level in the water sector. The overriding theme in formulating the Water Law was that water resources should be developed and managed efficiently in order to meet present and future needs in an environmentally sustainable way.

International and/or Bilateral Agreements:

The Declaration of Principles signed on September 13, 1993 (Oslo I) was the first bilateral agreement between the Palestinians and the Israelis. According to this agreement, water resources issues were to be discussed by the permanent Palestinian-

Israeli Committee for Economic Co-operation. The parties agreed to prepare plans for water rights and equitable use of water resources. However, the agreement did not identify or establish any explicit water rights for the parties, meaning that this agreement did not address Palestinian water rights in explicit terms.

Then came Oslo II (Interim Agreement on the West Bank and Gaza Strip) and the appended Article 40, which had to do with water and sewage. This was called the Interim Agreement and it was signed on September 28, 1995. It was Oslo II / Article 40 that established the framework for co-operation in the field of water and sewage between Palestine and Israel – with embedded conflicting meanings of sustainable yield and current use, not scientifically based.

Under the umbrella of the Multilaterals in the Middle East Peace Process, a Declaration on Principles for Co-operation Among the Core Parties on Water-Related Matters and New and Additional Water Resources was also "initialled" in 1995. This Declaration pointed out the importance of:

- Developing regionally compatible legal, economic, and institutional frameworks, and
- The ability of the participating parties to co-operate based on identified common denominators among their respective water management systems.

There was an attempt at negotiations for an agreement on water resources in Camp David in July 2000. These negotiation rounds ended negatively. During discussions, Israel offered the Palestinians additional "allocations" and Palestinian water rights were not discussed at all**.**

It should be noted that in the West Bank especially, the water sector is still controlled by the military orders of the 'civil' administration that have been in effect since 1967, and these military orders are still largely valid in Area C in the West Bank – which is the largest designated Area (when compared to A and B).

Strength and weakness

A regulatory framework is developed, but still clear water rights need to be defined and applied according to international water law. According to Oslo II, Article 40, there exists 70-80 MCM/year as an additional supply for Palestinians (within the Interim Period), with 28.6 MCM for immediate needs. Only around 15 MCM has been developed to the point of actual supply through Palestinian implemented projects.

1.6 Institutional settings and process: The institutional framework in the water sector

Over the 30 years of occupation in Palestine, the water sector was kept fragmented and the scattered responsibilities within the water sector were really a case of survival of the fittest. Whatever donor finances were available went to those who knew how to apply for funding. The occupation authorities did not work with the benefit of the Palestinian public in mind.

With the formation of the Palestinian National Authority, the institutional reforms within the water sector centred on the following three issues:

- The water sector should be regulated by one responsible body, with the separation of the institutional responsibility for policy and regulatory functions from those of service delivery;
- Regional utilities were to be set up, three in the West Bank and one in the Gaza Strip
- Involvement of the private sector would eventually be encouraged in the funding and implementation of projects.

Thus, the overall institutional framework of the water sector in Palestine is shown below. As of 2004, the Regulatory Level (the Palestinian Water Authority) has been developed institutionally, and the Central (Ramallah) and Southern (Bethlehem/Hebron) water utilities are being strengthened in the West Bank, along with the Gaza Strip utility. The Northern utility in the West Bank has not, as yet, been set up. The Bulk Water Utility will be institutionalised, stemming from what was called in the past the West Bank Water Department. A few community-based water-user associations have been established. The National Water Council is set-up legally, and members have been designated, but there has been no formal meeting to-date.

Table 3: Institutional Framework in the Water Sector

Policy and Decision Making Level	Cabinet of Ministries National Water Council	
Regulatory Level	Palestinian Water Authority	
Service Delivery Level	Bulk Water Utility	
	Regional Water Utilities	Water User Associations

1.6.1 Supporting and advisory level

Universities provide support to the water sector research activities and training experience to the Palestinians working in the water sector. NGOs/GOs (both Palestinian and international) provide financial and technical support to the water sector projects. Water User's Associations (such as the Jenin village) provide direct feedback to the regulator regarding their requirements and concerns**.**

Strength and weakness

Institutional development and capacity building in the water/wastewater sector is being emphasized, but the ability to act is restricted by actual political situation determined by Israeli occupation.

1.7 Principal stakeholders, their roles, interests and conflicts

The partners and interested parties (i.e., stakeholders) include the Palestinian National Authority ministries and authorities, regional and local water departments and utilities, municipalities, village councils, NGOs, international organisations, industries, farmers, as well as individuals involved in analysing and evaluating water and environmental problems.

The Palestinian water sector consists of the following strategic stakeholders:

- Palestinian Water Authority (PWA): regulator of the water sector.
- Ministry of Agriculture: is responsible for guiding and overseeing the agricultural sub-sector, which represents a major Palestinian water user.
- Ministry of Planning: is the key policy formulator for future Palestinian development in all sectors.
- Ministry of Health (MoH): is the regulator of the health sub-sector. In this role, the MoH is responsible for establishing and regulating health standards and guidelines in Palestine, including drinking water standards.
- Ministry of Local Government: is the key link between the national government and municipalities and local councils. In the water sector, this ministry is involved in the co-ordination of local water sector operations and processing license applications.
- Ministry of National Economy: serves as the planning agency for industrial sub-sector. Planning efforts for industrial development will impact water demand in Palestine.
- Environment Quality Authority: is the regulator of the Palestinian environmental sub-sector. They do not have direct authority over water resources planning and management; however, environmental regulation in the form of policy, standards or law places limits, constraints and requirements on water resources management actions. They influence the water sector with concerns about both water quality and water quantity.
- West Bank Water Department: is responsible for developing and maintaining bulk water supply in West Bank with many of the wells still being controlled by the Israeli water company Mekorot. The future plan is to transform this agency into a bulk water utility providing wholesale water to the regional utilities.
- Regional Water Utilities: the Palestinian water sector has strategically committed to the development of three regional utilities in West Bank and one in Gaza Strip, for the management of water and wastewater services, operations and
- maintenance of water infrastructure and fee collection.

Other significant stakeholders are:

- Ministry of Justice, which impacts final approval of water regulations
- Ministry of Finance, which will provide final approval of water tariff schemes and will aid in identifying financing sources and methods of cost recovery
- Municipalities and Village Councils, which provide and require support and guidance to the design and implementation of water-related activities
- Also Water Users Associations, Universities and NGOs

Strength and weakness

Although the responsibilities of newly formed governmental institutions have been defined while other are still in various stages of development, there is an urgent need for political stability in order to coordinate initiatives towards socio-economic development which is severely hindered in all its aspects by the current situation in Palestine.

2 Meeting the UN concept: The national understanding of water

2.1 The national water policy and the Human Right concept of water

Water has become one of the most critical natural resources in the world, and Palestine is in one of the regions in the world facing serious water shortages. There are great disparities in water availability and use within the region because the resources are so unevenly (or inequitably) distributed. It is these disparities that constitute growing concerns about future access to water for Palestinians, particularly since the situation is that Palestine shares water resources with two or more countries.

Water is needed in all aspects of life - for human consumption, agriculture (livestock and irrigation), and industrial activities. Also, availability of safe water is inversely related to some health problems (dysentery, diarrhoea, etc). This centrality to the very existence of man and his supporting economy means that even though it is a renewable resource, there is a need to utilise water in a sustainable manner to ensure the continuance of the resource. This is the only way any country will be able to survive.

"No water, no future"

Dutch Prince of Orange, Willem Alexander, Kyoto, Japan, March 2003

In November 2002, the United Nations Committee on Economic, Social and Cultural Rights affirmed that access to adequate amounts of clean water for personal and domestic uses is a fundamental human right of all people. In its General Comment No. 15 on the implementation of Articles 11 and 12 of the 1966 International Covenant on Economic, Social and Cultural Rights, the Committee noted that; “the human right to water is indispensable for leading a life in human dignity. It is a prerequisite for the realization of other human rights.” While the General Comment is not legally binding on the 146 States that have ratified the International Covenant, it aims to assist and promote the implementation of the Covenant and does carry the weight and influence of “soft law”.

The decision elaborates that the sufficiency of water should not be interpreted narrowly, by mere reference to the volume of water or to technologies. Water should be treated as a social and cultural good, and not primarily as an economic commodity. Without equitable access to a minimum requirement of clean water, other established rights, such as the right to a standard of living adequate for health and well being, as well as civil and political rights, are not attainable. The legal obligation ensuing from such an acknowledgement of a right to water should motivate governments of both developing and donor countries to make effective changes in domestic and aid policies and resource “allocation”.

Water is essential to human life — for basic health and survival, as well as food production and economic activities. Yet Palestine is presently facing a national emergency in that there is a lack of access to a basic supply of clean water and access to adequate sanitation: the primary cause of diseases linked to water, as well as a potential source of contamination to the water resources themselves.

Strength and weakness

The concept of the Human Right to water is well understood in Palestine. Even though water is mentioned as 'an economic good' in the Palestinian Elements of a Water Policy – it is described as such only with the intent that any "damage" to water should be compensated by the "polluter". This statement is, thus, supporting the basic premise that water is a social and cultural good - because water is "the property of the state" – which is stated as the first element of water policy.

Other elements of the Palestinian Water Policy that fit directly into the essence and spirit of the Human Right to water are:

- Water has a unique value for human survival and health, and all citizens have a right to water of good quality for personal consumption at costs they can afford.
- Water supply must be based on a sustainable development of all available water resources.
- The development of the water resources of the Palestinian territory must be co-ordinated on the national level and carried out on the appropriate local level.
- Public participation in water sector management should be ensured.

Water supply to Palestinians is artificially constrained by the ongoing occupation, the extreme measures of the Israelis, and the stagnation and inherent deficiencies of the Peace Process. The political situation is an overwhelming burden on any hope of improvement in socio-economic development.

2.2 Areas of concern and opportunities

Water sector problems in Palestine require a multidisciplinary approach. Several major elements can be identified that characterise the nature and scope of the water issue in Palestine: (Assaf 2000, ESCWA/FAO 1985, Jarrar et al 2003, UNEP 2003)

- Chronic Water Scarcity: There is an ever-widening gap between the demand for quality water and the existing supply.
- Interdependence on Water Resources: Water is a shared resource. This creates interdependencies that require co-operation between the parties if optimum use is to be achieved.
- Social, Economic, and Political Differences: The countries in the region around Palestine have distinct social, political, and economic systems and water regimes. Differences between the basic outlook and agendas of these countries must be acknowledged and overcome if water problems are to be confronted and resolved at a regional level.
- Political Volatility: The pattern of relations between Israel and Palestine can be described as variable, ranging from open hostilities to full-fledged negotiations.
- Undefined borders: Despite some progress during the past phases of the peace process, most of the borders of the State of Palestine (and in the inverse, also Israel) are not recognized internationally. As a consequence, the

rights to access water resources within those borders are undefined and can be a contributing factor in bilateral and regional tensions.

Although the first three of these elements characterise circumstances in Palestine and the Middle East in general, they are common, in some degree, to other regions of the world. The scarcity of quality water, whether resulting from limited availability or from uninformed management, rarely respects political boundaries. Water resources are often shared between different political entities, and riparian claims can impair otherwise normal peaceful relations between states. Disparity between socio-economic and political systems also is common between neighbouring states, and all regional water systems are affected somewhat by politics.

The development of Palestinian water resources has as its aim - in common with Palestinian development generally - the enhancement of the conditions of human life and must be recognised as an integral part of its social and economic programs. It must always be remembered that the development goals chosen by "the Palestinian governing authority" for their people are not realisable in the absence of water adequate in quantity and quality.

To date, supply-oriented and resource-oriented water management dominated the scene in Palestine with emphasis on structural measures to cope with supply of water and water-related services. Now the time has come to implement the Palestinian policy for water resources development, planning and supervision that includes non-structural measures such as data collection and analyses (based on a sound "structured" monitoring system), legislation and regulation, economic incentives and penalties, as well as public participation. Since the establishment of the Palestinian Water Authority in 1996, intensive and broad institutional development programs have been initiated, aimed at developing the management tools necessary for a sound and sustainable integrated water management policy.

Lastly, future water resource planning in Palestine should include adequate links and co-ordination with other Palestinian national master plans - such as agriculture in general, forestry, economic and industrial expansion and urban planning. This type of inter-disciplinary approach should aim at a more efficient operation of the existing water schemes as well as providing the infrastructure for new systems. This will be done in Palestine through the National Water Council as set-up in the Water Law and can be done even better once Palestinian water rights are defined.

3 List of Palestinian NGOs

The NGOs in Palestine engaged in activities in the water sector are listed below. These institutions are involved in research as well as infrastructure development, lobbying and awareness building.

Applied Research Institute--Jerusalem (ARIJ)

P.O.BOX 860
Caritas Street, Bethlehem, Palestine
Tel: +972-2-2741889
Fax: +972-2-2776966
E-mail: jad@arij.org
Website: http://www.arij.org

Founded in 1990, the Applied Research Institute of Jerusalem (ARIJ) is a non-profit organisation dedicated to promoting sustainable development in the occupied Palestinian territories and the self-reliance of the Palestinian people through greater control over their natural resources.

Arab Scientific Institute for Research and Transfer of Technology (ASIR)

P.O. Box 3681, Above Central Marketplace
El-Bireh, Palestine
Tel/FAX: +972-2-295-5380
Mobile: +972-59-836-430
Email: kassaf@planet.edu, kkassaf@yahoo.com

ASIR was founded in 1981, and has been involved in water research from the beginning by studying the wells in the Jordan Valley for Birzeit University Research and Documentation Centre. ASIR continues to study water resources and management in the region, water security, food security, desalinisation (especially membranes), and water re-use and cropping patterns, and interpretation of chemical analysis data of water. Emphasis is on transfer of know-how and technology in the water and environmental fields.

Land Research Centre (LRC)

4 Abu Obeida St.
P.O. BOX 20479
Jerusalem, Palestine
Tel (temporary): +972-2-2217239
Mobile: +972-50-507931
E-mail: lrc@palnet.com

On February 6, 2002 the LRC was forcefully shut down and data and equipment were confiscated by the Israeli security services. Although this institution worked primarily on land issues, their input into environmental network was significant, for example, their study entitled "Inventory of the Soil resources of the West Bank and the Gaza Strip.

MA'AN Development Center

P.O. Box 51352
Ramallah, Palestine
Telefax: +970 2 2954451/
+972 2 2986796/2986698 Gaza Branch Office
P.O.Box 5165
Gaza, Gaza Strip
Telefax: +970 7 2823712
E-Mail: maanc@palnet.com
Internet Site: http://www.maan-ctr.org/

Ma'an has concentrated on self-sufficient development activities since it was founded in 1989, but has broadened its mandate to encompass initiatives to strengthen Palestinian institutions that develop the rural and agricultural sectors – especially agricultural water resources.

Palestinian Agricultural Relief Committees - PARC

Jerusalem Office

P.O.Box 25128
Shu'fat, Jerusalem, Palestine
Tel: +972-2-5833818
Fax: +972-2-5831898
E-mail: pr@pal-arc.org
Website: http://www.pal-arc.org/

Founded in 1983, PARC's aims include achieving comprehensive environmental development, developing and optimizing the utilization of available water resources.

Palestinian Hydrology Group (PHG)

Ramallah (Main Office)
Al-Ma'ahed St., Near Casablanca Hotel
PARC Building
P.O. Box 565
E-mail: phg@palnet.com
Website: http://www.phg.org/
Tel: +972-2-2966315/8
Fax: +972-2966319
Offices in Jerusalem, Hebron, Nablus, and Gaza.

Established in 1988 dedicated to developing and protecting water and environmental resources, and to insure more public accessibility to adequate water supply sources and sanitation – especially in rural areas. Primary activities include: Conventional Water Resources Rehabilitation and Development, covering rainwater harvesting and rural and small community sanitation and water development. It promotes awareness and conservation, including lectures, workshops, campaigns and exhibits, and lobbying and advocacy

The Society for Environmental Protection

Jenin, Palestine
Tel: +970-9-2385894

Established in 1996 with the main goal of protecting the Palestinian environment and minimizing existing environmental problems through activating society's role and expanding public awareness. Main activities will be in the future (due to the current situation) including environmental summer camps, and awareness programs, using posters, leaflets and training programs.

Union of Palestinian Medical Relief Committees (UPMRC)

P.O. Box 51483 Jerusalem, Palestine
Tel: +972-2-5833510/2697/8/4021
Fax: +972-2-5830679
Email: mrs@baraka.org
Website: http://www.upmrc.org/
Offices in Ramallah, Gaza, Hebron, Nablus, and Tulkarem.

Founded in 1979 as a medical / health services association, this institution does have a separate department dealing with the environment and health. Like its other departments, the environment and health units provide health education and medical care.

Palestinian Universities:

Institute of Water Studies, Birzeit University

P.O. Box 14
Birzeit, Palestine
Telefax: +970-2-2982120
E-mail: mbarakat@birzeit.edu

The Institute of Water Studies at Birzeit University was established in 2001 to contribute to the building of the Palestinian water sector by providing knowledge, advisory services, graduate education (MSc level), research and continuous education through short-term training in water and related issues. In addition, the Institute of Water Studies participates in solving crucial water problems within Palestine and the neighbouring countries through research projects, consulting activities and joint regional activities. Together with the International Institute for Infrastructural, Hydraulic and Environmental Engineering in The Netherlands, (IHE-Delft), BZU will establish a sustainable training and knowledge centre at the University for professionals of the water sector in Palestine.

Water and Soil Environmental Research Unit (WSERU), Bethlehem University

P. O. Box 9
Bethlehem – Palestine
Tel: + 970-2-2741242
Fax: + 970-2-2744440
Email: abedrabo@bethlehem.edu

Established in 1988, this unit of Bethlehem University responds effectively to requests from a large number of municipal authorities for help and information on water quality issues, and provides data and makes recommendations to appropriate agencies.

Water and Environmental Studies Centre (WESC),

Al Najah University
P.O. Box 7
Nablus, Palestine
Tel: +972-9-2383124
Fax: +972-9-2387982
E-mail: anan@najah.edu

Established in 1984 to meet the needs of the Palestinian community in the areas of water and environmental control, maintenance and education. This centre is involved in analysing and evaluating water and environmental problems. This centre has been involved in many regional studies.

Water and Environmental Development Organisation (WEDO)

Palestine Street
P.O. Box 844
Bethlehem, Palestine
Tel: 970-2-274-7948
FAX: 970-274-5968
E-mail: wedo@p-ol.com

4 List of donor activities

In order to provide a sound basis for planning and a program for short to medium term investment projects, all within the framework of a water sector investment program and the Palestinian economic development objectives, the governmental institutions use a Strategic Plan that draws together various local and sub-sectorial plans and, where appropriate, can identify multi-objective and regional solutions.

Within the non-governmental organizations, water projects are also coordinated with the regulatory arm (PWA) in the water sector. The data below are official figures as published by the Palestinian Water Authority. No figures were available for projects in the non-governmental organizations.

The Palestinian Water Authority issues periodic reports including detailed information about water project status and donor contribution in water sector in Palestine. As of 2003, the following statistics are available for the West Bank and Gaza Strip: (Palestinian Water Authority 2003a, 2003b, 2003c)

- In the Northern Governorates (West Bank), the total investment cost of water projects (completed, ongoing, committed) since the establishment of Palestinian Water Authority in 1996 through 2002 is about 500 million U.S. dollars. This figure includes all governorates and all water sectors, in which the total implemented cost is 150 million US dollars,
- On-going project costs are 300 million US dollars,
- 50 million US$ have been committed to future projects by donors. Around 90% of these investments were grants, and 10% soft loans, which come from the European Investment Bank (EIB) (30 million US$), and the World Bank (21 million US$).

The investment in the West Bank Northern Governorates were distributed according to the following water categories:

- water supply 200 million US$,
- water conservation 80 million US$,
- wastewater 130 million US$,
- institutional and capacity building 30 million US$,
- while the remaining water categories (storm water, water resources, irrigation systems) were around 60 Mio. US dollars.

In the Southern Governorates (the Gaza Strip), the total investment cost of water projects (completed, ongoing, committed) since the establishment of Palestinian Water Authority in 1996 through 2002 is about 230 million US$ (only through the PWA). This figure includes all governorates and all water sectors, in which

- the total implemented cost is 60 million US$,
- ongoing projects cost is 170 million US$.

Around 90 percent of these investments were grants, and 10 percent soft loans, which came from the European Investment Bank (EIB) (23 million US$), and the World Bank (30 million US$).

The investment in the Gaza Strip Southern Governorates were distributed according to the following water categories:

- water supply 100 million US$,
- water conservation 40 million US$,
- wastewater 40 million US$,
- institutional and capacity building 30 million US$,
- while the remaining water categories (storm water, water resources, irrigation systems) were around 50 Mio. US dollars.

The highest development was in the Hebron and Bethlehem governorates of the West Bank, around 200 million US$ - Ramallah 50 million US$, while in the north in the Nablus governorate around 130 million US$. The remaining governorates share was limited because the geographic distribution of these investments was constrained by the Israeli obstacles through preventing JWC (the Joint Water Committee) approval to many projects.

The major donors who contributed to the water and sanitation sector are; USA, Germany, Norway, France, Netherlands, Japan, Sweden, Denmark, Italy, Saudi Arabia, Greece, and Austria. In addition, important contribution came through international organizations like the World Bank, UNDP, and OPEC.

The importance of these projects can be summarized as:

- Emergence of PWA as a sustainable organization.
- Increasing water supply of 30 %.
- Reduction of leakage by 5-20%
- Increase access to new served areas

In spite of the generous contribution of donors in improving the water sector in Palestine, there is still a need for future investment, since the estimated total capital investment for the proposed future investment plan for the West Bank Northern Governorates is approximately $1.1 billion ($0.5 billion for capital investments, $0.6 billion for operation and maintenance) over the planning period (2003 to 2025), while for the Gaza Strip Southern Governorates the proposed investment is around $0.8 billion over the same period ($0.3 capital investments, $0.5 operations and maintenance).

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6 Pictographic impressions

Boys getting a drink of water from a puddle in Gaza

Small girl collecting drinking water

Jerusalem showing water baths and water carrying structures