WASH
Poverty Diagnostic | SERIES

Toward Water Security for Palestinians

West Bank and Gaza Water Supply, Sanitation, and Hygiene Poverty Diagnostic

WORLD BANK GROUP

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Acknowledgments

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Abbreviations

CMWU	Coastal Municipalities Water Utility
EQA	Environmental Quality Authority
IBNET	International Benchmarking Network for Water and Sanitation Utilities
IWII	institutional change, water resources, investment, and incentives
JSC	Joint Service Council
JWC	Joint Water Committee
JWU	Jerusalem Water Undertaking
KPI	key performance indicator
lcd	liters per capita per day
LGPA	Local Government Performance Assessment
LGU	local government unit
m^3	cubic meter
M&A	movement and access
MCM	million cubic meters
MDG	Millennium Development Goal
M&I	municipal and industrial
MICS	Multiple Indicator Cluster Survey
MoFP	Ministry of Finance and Planning
MoH	Ministry of Health
MoLG	Ministry of Local Government
MoU	memorandum of understanding
NGO	nongovernmental organization
NRW	nonrevenue water
NWC	National Water Company
O&M	operation and maintenance
PA	Palestinian Authority

PECS	Palestinian Expenditure and Consumption Survey
PPP	public-private partnership
PWA	Palestinian Water Authority
RO	reverse osmosis
RWU	Regional Water Utilities
SDG	Sustainable Development Goal
SDP	Strategic Development Plan (PWA's water sector development plan)
SDIP	Strategic Development and Investment Plan (local government development plans)
SP	service providers
UNICEF	United Nations Children's Fund
VC	Village Council
WASH	water supply, sanitation and hygiene
WASH-PD	WASH Poverty Diagnostic
WBWD	West Bank Water Department
WD	water department
WHO	World Health Organization
WSIP	Water Sector Investment Plan
WSRC	Water Sector Regulatory Council
WSSA	Water Supply and Sanitation Authority
WWT	wastewater treatment

Note: All dollar amounts are in U.S. dollars.

1 NIS = $0.26; $1.00 = 3.80 NIS

Executive Summary: Constraints and the Way Forward (The IWII Framework)

Four elements – institutions (I), water resources (W), investment (I), and incentives (I) (the IWII framework) – are the key to improving sector performance.

The Water Supply, Sanitation and Hygiene (WASH) Poverty Diagnostic in West Bank and Gaza is part of a global initiative to improve evidence on the linkages between WASH, poverty, and service delivery at the local level. The Diagnostic explores long-term trends in access to improved water supply and sanitation, assesses how equitably water supply and sanitation services are distributed across regions and by household wealth, brings new evidence on the transition from Millennium Development Goal (MDG) to Sustainable Development Goal (SDG) indicators, and examines the binding constraints to improve service delivery. While the global initiative also looks at the linkages of WASH services with other sectors such as health and education, data limitations made this impossible in the context of West Bank and Gaza. However, this Diagnostic gives special attention to water scarcity, which is a major constraint to viable service delivery.

Toward Water Security for Palestinians

West Bank and Gaza is a very water-scarce lower-middle-income territory with a relatively water-dependent economy and is vulnerable within its geopolitical setting. Assuring water security is thus a priority. *Water security* requires adequate water resources that are well managed, including management of risks, and water supply services that provide sustainable, efficient, and equitable.

However, the goal of water security has been receding in recent years. West Bank and Gaza's population of approximately 4 million is growing fast. With increasing economic needs for water and a dwindling resource, demand already far outstrips supply. The situation is deteriorating year by year. Internal renewable water resources are being overdrawn, particularly in Gaza, where the quality of water from the aquifer has become undrinkable. Dependence on purchased water has been growing and the need for further water purchases from Israel inevitably complicates matters; obtaining new water resources has become a transboundary and political issue. Huge efforts have been expended to improve water supply and sanitation services in recent years, with $1.3 billion invested in the last decade. As a result, water network connections reach almost every household. However, the decline in water quantity available per person, inefficiencies in service delivery, and above all the plummeting quality of Gaza's water resources have led to a steep decline in service quality. Inadequate wastewater treatment and disposal is also a growing environmental issue.

Figure ES.1 presents a schematic of the improvements needed in water supply and sanitation services to bring about water security for the people of West Bank and Gaza.

Figure ES.1: Toward Water Security: A Diagnosis of Improvements Needed in Water Supply and Sanitation Services

Source: WASH-PD team.

The Geopolitical Context: A Severe Constraint to Water Security

The geopolitical context places severe constraints on the water security of the Palestinian territories. This report explicitly attempts to understand the margins of maneuver of the Palestinian Authority (PA) to improve service delivery in West Bank and Gaza within the geopolitical context. Uniquely fragmented geography, characterized by the isolation of Gaza from the rest of the world, and barriers to internal movement and access within West Bank play an important role in explaining variations in socioeconomic outcomes across locales and regions (Vishwanath et al. 2014). Investment in water supply and sanitation infrastructure has been constrained by movement and access restrictions. Water supply in Gaza has been at crisis levels since 2005. The political and security situation has curtailed access to power, fuel, and spare parts and constrained investment and implementation of projects. West Bank has benefit to less of its own internal water resources today than was agreed internationally more than two decades ago under the 1995 Oslo Accords, while the population has grown considerably and demand for water has risen.

Political economy factors have constrained the ability of the Palestinian Water Authority (PWA) to improve service delivery. These political economy constraints include: issues of water sovereignty and dependence on Israel, which limit PWA's ability to develop and manage water resources; constraints that inhibit the Palestinian Authority (PA) from working with Israel in the Joint Water Committee (JWC) under Article 40 of the Oslo Accords[1] and so also impede development and management of water resources and services; and serious delays in investment planning and implementation because of movement and access restrictions. PWA is nonetheless striving to move forward, as evidenced by the recent reengagement with the Joint Water Committee. Political division between Gaza and Ramallah have complicated governance arrangements and limited PWA's ability to operate effectively in Gaza.

These constraints affect the provision of services both in accessing adequate bulk water supplies and in investing in and implementing projects for developing water supply and sanitation infrastructure. The history of the last 20 years demonstrates that, under these challenging conditions, PWA has not been able to develop even all those water resources agreed under Article 40. PWA's ability to regulate groundwater extraction has been constrained, particularly because of internal political tensions in Gaza. Water allocations to municipal and industrial (M&I) uses have become increasingly inadequate as demand has gone up much faster than supply. PWA's plans for water resources development respond to aspirations and to need rather than to feasibility – and are inevitably more statements about recovering control over natural resources that Palestinians consider their own than practical planning.

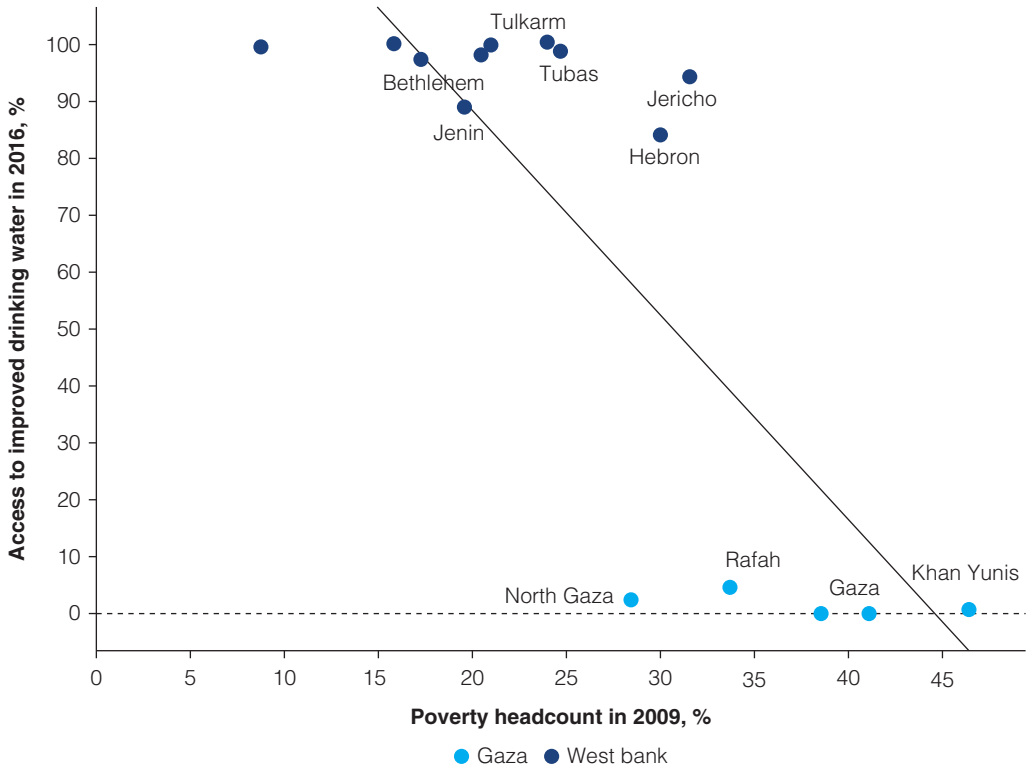
Service Delivery: High Levels of Development but Worsening Quality and Access

In terms of poverty and water supply, Gaza and West Bank are effectively two different worlds (figure ES.2). Gaza residents are much poorer than West Bank residents. Their access to improved water has plummeted from near total coverage two decades ago to almost zero today. More than one-third of Gaza residents are poor, as measured by the poverty headcount rate of nearly 35 percent.[2] Although 95 percent of the population is connected to the piped network, only 1 percent of the population has access to improved drinking water that meets the standard of the Sustainable Development Goal (SDG) indicator, according to 2016 data from the Local Government Performance Assessment (LGPA). The situation has deteriorated quickly. Access 20 years ago was almost universal, and even in 2010 it was 14 percent.

Tap water in Gaza is now undrinkable and almost everyone relies on water from small-scale desalination plants as a coping strategy. The reason for the rapid decline in access is that Gaza's only internal renewable source of water, the Coastal Aquifer, has been so overexploited that the water is no longer fit to drink. Most of the 260 municipal wells have salt and nitrate levels above standards set by the World Health Organization (WHO). The result is that 97 percent of the population rely on informal and unregulated private water tankers and small-scale informal desalination plants for drinking water. Water provided through networked systems by formal providers is used for other domestic purposes.

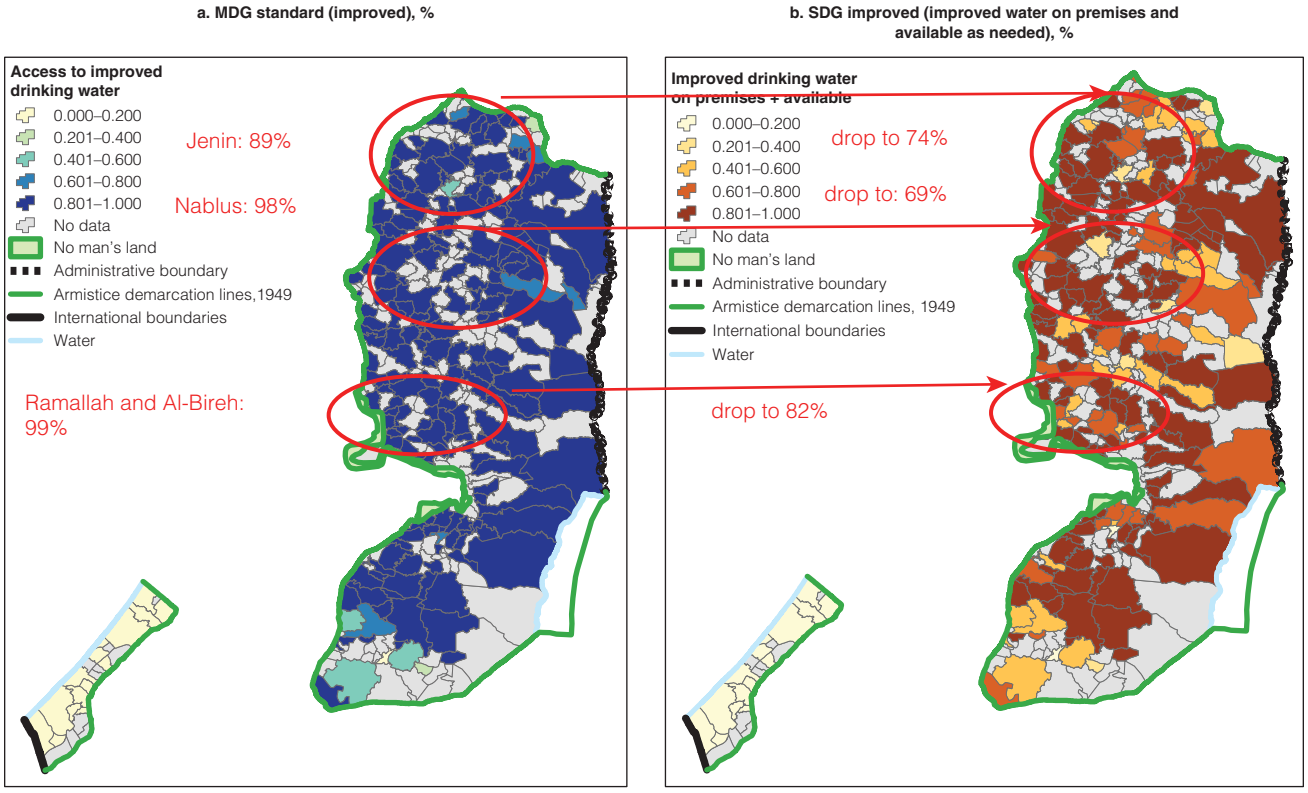
In West Bank, by contrast, poverty is much lower and most of the population uses piped water for drinking. The poverty headcount rate is much lower than in Gaza (about 16 percent in 2011) and access to improved drinking water is nearly universal (93 percent of the population).

Figure ES.2: West Bank and Gaza: Different Worlds in Terms of Poverty and Water Supply



Source: LGPA 2016.
Note: Poverty rates are from Vishwanath et.al. 2014.

Figure ES.3: Two Different Measures of Drinking Water Availability by Local Government Unit, 2016



Source: LGPA 2016.
Note: LGPA = Local Government Performance Assessment; LGUs = local government units; MDG = Millennium Development Goal; SDG = Sustainable Development Goal.

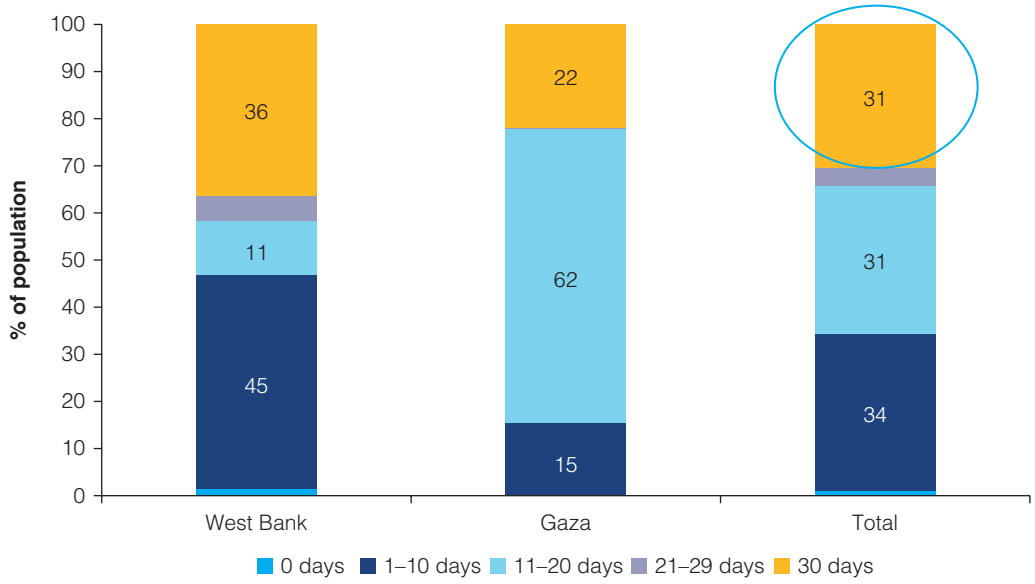
However, in West Bank, access to piped water on premises does not translate into quality services. Consider the measure of "access when needed," defined as "not available for at least one full day during the previous two weeks." By this measure, access to improved water in the West Bank drops from 93 percent to 80 percent, with the biggest decreases in the governorates of Jenin and Nablus, as well as Ramallah and Al-Bireh governorates, where service is frequently intermittent (figure ES.3).

Sanitation coverage is high, but connection to sewerage networks is much higher in Gaza than in West Bank. In Gaza, access to improved sanitation is universal, with 78 percent of population connected to sewerage networks and the remainder relying on on-site services. In the West Bank, despite near universal access to improved sanitation (94 percent), access to sewage connections is only 30 percent, with rates varying widely by governorate, from zero (in Tubas) to 59 percent (in Qalqilya). Access also varies strongly by household income: only 13 percent in the poorest quintile are connected to sewer networks, compared to 42 percent in the richest quintile.

Across all governorates, overflows of sewage are frequent or occasional for 18 percent of the population using improved sanitation. These overflows occur more often in the northern governorates of West Bank. Tubas, Salfeet, and North Gaza have the highest percentage of the population experiencing an overflow at least once in a month in 2016. Overflows are more likely among the poor in Gaza than the wealthy.

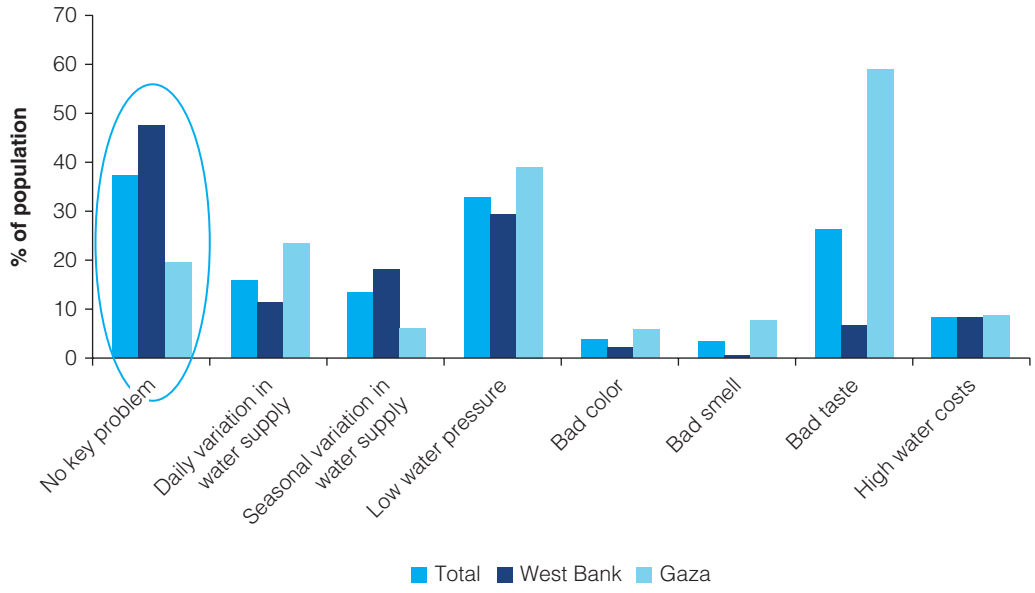
In the face of intermittent water supply services, people have adopted coping strategies and are resigned to poor service. Only 36 percent of the population of West Bank, and 22 percent of the population in Gaza, receive a continuous supply of water every day of the month, (figure ES.4). Despite this high intermittency, nearly 50 percent of the population in West Bank report no

Figure ES.4: Days of Piped Water Supply, 2016



Source: LGPA 2016.

Figure ES.5: Key Problems Reported in Water Supply, 2016



Source: LGPA 2016.

problem with their service (figure ES.5) – indicating that they have settled for low standards. People have developed coping strategies. Storage tanks are universal.

Poor service and poverty seems to be driving high nonpayment rates for piped water, especially in Gaza. Almost 30 percent of the population connected to piped water pay their water bills late or do not pay at all for piped water. This share is much higher in Gaza, where 43 percent of

population report that they do not pay their bill. While this share is much lower in West Bank, around 19 percent of population still pay late or do not pay at all. Nonpayment is strongly correlated with welfare in Gaza. Thus, among the richest households, only 15 percent do not pay for piped water, while among the poorest households, about 56 percent do not pay.

Inefficiency, Insufficiency, and Inequality of Water Supply Service Delivery

West Bank: Inefficiencies in Water Supply Service Delivery

Inefficiencies in the distribution of water through service providers add to the challenges with bulk water supply. Physical losses, theft, and unbilled water supply are very high. Overall, service providers receive revenues on only about 70 percent of the water they supply; the rest is so-called non-revenue water (NRW).

While a rate of 30 percent for non-revenue water may be sustainable in a water-rich country, it is not in West Bank. These levels of non-revenue water are a dramatic loss for a very water-scarce nation.

Collection rates are also very low (71 percent of customers pay their bills, on average),[3] and tariffs barely cover costs the costs of operation and maintenance (O&M) and make no provision for depreciation.

A combination of high non-revenue water, inadequate tariffs, and low collection rates undermine the financial viability of most service providers and impair their ability to invest in operation and maintenance. The average West Bank service provider is collecting only 76 cents on each dollar of costs. As a result, almost all West Bank service providers are dependent on alternative sources of finance to cover their operating deficits through hidden subsidies, and all are dependent on public or donor finance to make capital investments or replace assets. Service providers have little room for improving services and no prospect of attracting private finance.

Gaza: Inefficiencies in Water Supply Service Delivery

Gaza service providers do not account for more than one-third of water supplied and are nowhere close to being financially viable in the short or medium term. Water not billed by Gaza service providers ranges from 38 to 50 percent, so that more than one-third of the scarce water pumped is not accounted for. With tariffs covering only two-thirds of costs and service providers collecting only 37 cents on each dollar of sales, the average service provider covers less than one-quarter (24 percent) of its costs. This dramatically low viability leaves service providers dependent on subsidies for both operations and investment, severely limiting their ability to improve services or attract private finance. Running a continuous and mounting structural financial deficit, service providers finance their operations simply by not paying their bulk water bills.

West Bank and Gaza: Inefficiencies in Sanitation and Wastewater

In West Bank, only one-quarter of wastewater is treated, very little treated wastewater is reused, and 25 million cubic meters (MCM) of untreated sewage are discharged into the environment each year. About one-quarter of the 62 MCM of wastewater generated in West Bank is collected in sewerage networks, and two-thirds of this is treated (about 13 MCM annually). However, almost none of this treated amount is reused, due to lack of planning and to constraints on developing the necessary infrastructure to pipe the treated water to farming areas. Despite considerable investment in expanding sewerage networks, two-thirds of West Bank residents still use cesspits, which places the groundwater resource at risk of contamination. The biggest

problem is the 25 MCM of untreated sewage discharged into wadis each year from 350 locations. Some 15 MCM of this flows into Israel, where it is treated and reused in agriculture. Israel charges the Palestinian Authority for treating this wastewater; the cost billed by Israel in 2016 was more than $26 million.

In Gaza, about 90 percent of wastewater is collected and partially treated but then discharged to the environment rather than being reused. Treatment plants are overloaded and function poorly, partly because of underfunding and partly because of Israeli restrictions on the entry to Gaza of energy and materials. Almost no treated wastewater is reused, and untreated and partially treated wastewater is discharged into wadis and directly into the sea.

Insufficiencies and Inequality in Bulk Supply

Dwindling internal water resources and increasing demand are creating more dependence on Israel. The Oslo Accords set the quantity of internal renewable water resources that the PA could develop and extract in West Bank. Through a combination of declining aquifer yield and rapid population growth, the availability of these water resources for each Palestinian in West Bank has fallen by nearly half from 190 liters per capita per day (lcd) in 1999 to only 100 liters in 2013. Because more than half of these resources are allocated to agriculture, in 2013 only 40 liters per capita per day was available for domestic, commercial, and industrial uses from internal sources. To offset the deficit between demand and the supply available from internal resources, the PA has increased water purchases from Israel, which in 2014 accounted for 56 percent of municipal and industrial (M&I) supply in West Bank.

Bulk water is unequally distributed within West Bank. The average quantity delivered by West Bank service providers is 80 lcd, but this varies by service provider from as little as 26 lcd in areas such as Dura and Yatta in Hebron governorate – a level scarcely more than the survival minimum for drinking, cooking, and personal hygiene – to a very high 242 lcd in Jericho. In some cases, supply has dropped markedly: in 2009, Bethlehem was supplying 142 lcd, but by 2015 this level had dropped by half, to 71 lcd.

Varying levels of dependence on purchased water lead to wide variations in water tariffs in West Bank and to varying levels of implicit subsidy. Tariffs are much lower in towns that have their own wells than towns that must purchase their water. Many towns that depend on purchased water respond to this higher cost by not paying their bulk water bill. This amounts to an implicit subsidy – the effects of which are also unequally distributed.

Groundwater abstraction in Gaza is out of control, with three times more water being extracted than the sustainable yield. The result is a decline in groundwater level and a deterioration in quality, largely caused by seawater intrusion. Only 4 percent of the aquifer now meets drinking water quality standards. Part of the problem is that the population has responded to water scarcity by expanding the drilling of private wells, which PWA has been unable to regulate. Quality is also affected by contamination of groundwater by sewage.

Sustainable renewable resources in Gaza total about 90 liters per capita per day, but the water is undrinkable. The quantity of (saline) aquifer water allocated to M&I uses in 2015 was about 145 lcd. However, the sustainable yield is currently only about 90 lcd. Even without considering the demands of agriculture, much of the allocation to M&I uses is unsustainable – which further depletes an already ruined aquifer.

Financial Impacts on the Sector and the Palestinian Authority

Hidden transfers at the bulk water supply level reward West Bank service providers that do not pay their bills. At the bulk level, municipal water departments benefit from two levels of transfers.

The first is a direct subsidy because the bulk provider, the West Bank Water Department (WBWD), bills water to service providers (SPs) at 20 percent below cost. The second is an indirect subsidy because many municipalities do not pay WBWD for the water. In 2014, the underpricing by WBWD and nonpayment by municipalities provided an effective transfer of NIS130 million ($35 million) to service providers, mainly the municipal water departments. This "subsidy" goes proportionally to the service providers that are the worst payers, rewarding the worst performers.

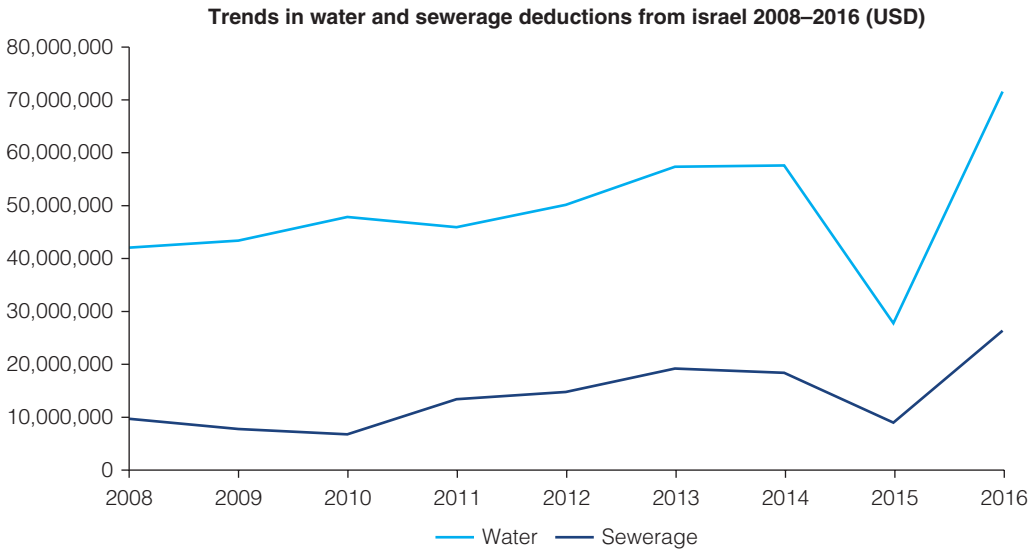
At the retail (consumer) level, the effective subsidies also disproportionately reward the worst payers rather than those who need it. Average retail tariffs in West Bank barely cover operating costs, but the low average collection rate (68 percent) causes massive accounting losses for the service providers, while consumers benefit from an aggregate "subsidy" of one-third of the cost. Again, the incentives and rewards go to those who behave the worst – in this case, the consumers – but this consumer subsidy is unevenly distributed. It goes mainly to those served by service providers with the lowest collection efficiency.

This web of hidden subsidies allows West Bank service providers to run a net deficit of about NIS100 million ($35 million) a year. Because service providers do not recover their costs from consumers, services run at a deficit. On average, in 2014 service providers lost roughly NIS1.57 for every cubic meter (m^3) supplied. As a result, the West Bank water sector experienced a total deficit on the order of NIS110 million, which providers covered by not paying WBWD for bulk water. Large arrears have built up (more than NIS1 billion, or $350 million, in arrears were recorded on WBWD's books in 2014).

These losses have been financed by the build-up of unpaid water bills from Israel (so-called net lending). Because service providers do not pay their bills, WBWD cannot pay the Israeli bulk supplier, Mekorot, for purchased water. As a result, Israel deducts the amounts due from the taxes it collects on behalf of the Palestinian Authority. In 2016, Israel deducted $94 million for unpaid Mekorot water bills (net lending) and for sewage treatment (figure ES.6). However, these deductions made by Israel are considerably higher than the calculations based on data from the Palestinian Ministry of Finance and Planning.

Palestinian purchases from Mekorot are expected to rise rapidly in coming years and unless efficiencies improve, the net lending problem will worsen. PWA currently purchases 70 million cubic meters (MCM) per year from Israel. Negotiations are underway for purchase of up to

Figure ES.6: Trends in Water and Sewage Deductions from Israel, 2008–16



Source: Palestinian Ministry of Finance and Planning.

another 30 MCM. A further 34 MCM may be delivered under the so-called Red-Dead accord, so that overall purchases may reach 135 MCM annually. Unless service providers can recover their costs from consumers and pay the full cost of bulk water, the net lending problem will only grow worse. In addition, it is likely that the deductions for untreated wastewater will continue until West Bank can capture, treat, and dispose of all its wastewater.

These inefficiencies and the financial impact on the sector beg the question as to why these outcomes are not only continuing but worsening.

Binding Constraints to Service Delivery

Institutional Constraints

The current organization of the sector is characterized by weaknesses in accountability, which generate problems in coordination and financing. The upward accountabilities of service providers are split between the Palestinian Water Authority (PWA), the Ministry of Local Government (MoLG), and the Water Sector Regulatory Council (WSRC). There is lack of clarity on relations among these bodies for regulation, water allocations, institutional development, and capacity building, and for planning and financing investment. In addition, many service providers are municipal water departments, which are part of local government units (LGUs) and are not run as autonomous operations with clear accountabilities to a board or to consumers, or with ring-fenced finances separate from other municipal finances and dedicated to water supply and sanitation services.

The 2014 Water Law was designed to clarify accountabilities and to establish autonomous utilities, but implementation has been slow. Most service providers are still governed under the 1997 MoLG Law. There are moves to begin "aggregation" of smaller service providers and to encourage service providers to strengthen transparency, accountability, and financial autonomy, but this is a voluntary process and is likely to be protracted. In the interim, the lack of clarity will continue as to accountabilities among the central agencies (PWA, MoLG, and WSRC), and the accountabilities of service providers, both upward and at the local level.

A divergence of attitudes between PWA and MoLG is inherent in the current set-up. Where PWA sees water supply services as a free-standing activity, MoLG sees water supply services as part of local government's allocated responsibilities. Local government units also often use water revenues as a means of covering their deficits on the provision of other services.

It is not clear that all stakeholders understand the reforms in the same way. Different interpretations of the 2014 Water Law by stakeholders at the central and local level suggest that the stakeholder consultation process at both levels has not yet resulted in full buy-in by MoLG, let alone by local government units (LGUs) – which increases the risks and delays in implementing the law and its supporting strategies.

Bulk Water Constraints

Securing additional bulk water is a binding constraint to improved service delivery. Obtaining additional quantities of freshwater or desalinated water is steeped in the geopolitics between West Bank and Gaza and Israel, as well as internal Palestinian politics in Gaza. PWA currently purchases 70 MCM from Israel and plans to double that in the next ten years. However, negotiations to secure this amount have been slow to materialize. PWA also aims to increase its own production of fresh water resources in West Bank, but this is subject to ceilings imposed in Article 40 and to Israeli consent to drill wells. Neither has proved flexible in recent years, although the recent revival of the Joint Water Committee may offer some prospect of movement. In Gaza, large-scale desalination has been discussed for years, but the conflict and blockade, along with severe energy

shortages, increase the challenges of undertaking so massive an investment. Even the small-scale desalination plants supported through humanitarian assistance rely on back-up generators to operate on daily basis, highlighting energy as a major constraint to water security in Gaza.

Investment, Planning, and Financing Constraints

There is no clear mechanism by which investment needs at the local level can be met. Local government units, including their water departments, lack a stable and predictable source of investment finance for planning purposes. As a result, LGUs and their water operations cannot conduct strategic planning for water. Most water investment is programmed separately by PWA. There is no clear planning mechanism by which local needs for investment (and for water) can be articulated and integrated at the central level. As a result, plans that are developed at the local and central levels are overly ambitious and/or unrealistic. In addition, citizen engagement is weak.

A further lack of clarity is introduced by the dependence on donor project financing. Donors finance 76 percent of capital investment, most of which is off-budget and which may be arranged outside of the formal planning process. Off-budget financing does not appear in financial statements and allocated budget and execution figures are not transparent. Planning is therefore weakly linked to actual investment. There is no consolidated program that allows investment commitments and expenditures to be tracked or implementation monitored.

Water sector financing – and water sector reform – are bound up with the need for reform of municipal finance. The revenue base of LGUs is weak. The absence of ring-fencing of water accounts means that water revenues may be diverted to general revenues. Municipalities derive 15 percent of their total revenue from water services, and Village Councils derive 16 percent. In overall municipal financing, water revenues are second only to electricity, which makes up 33 percent of revenues. Although few LGUs derive an accounting surplus from their water operations, many simply retain a share of the water revenues to finance other operations and do not pay for their bulk water, contributing to the net lending problem. Unless the financing of LGUs is put on a surer footing, LGUs will have limited incentive to separate their water operations as autonomous accounting centers, and even if they do, they may find other ways to divert water revenues to their own account. The experience from the energy sector reforms is that net lending has not been reduced, as LGUs divert revenues in the form of dividends. Unless municipal financing is put on a stable footing, water sector reform will be constrained.

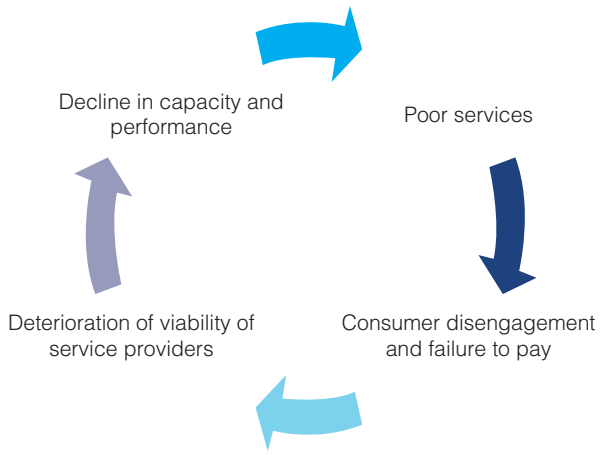
Current conditions limit the possibility for large-scale private participation in water. The PA has a clear, long-standing policy of private sector participation. The legal and institutional framework for this has recently been improved. Upcoming investments could potentially attract large-scale private sector investment and management, notably for desalination in Gaza. However, the private sector lacks confidence in the transparency and stability of government policy and in the financial viability of water sector entities and their accounting and financial management standards. Essentially, few if any current water operations are bankable for private or bank investment.

The Way Forward – A New Way of Thinking (the IWII Framework)

The Goals of Water Security and Improved Service Delivery Risk Slipping out of Reach

Palestinians have not achieved water security – and in some areas water security is slipping away. The Palestinian Authority has been working for a decade to reach high standards in water

Figure ES.7: The Vicious Cycle of Palestinian Water Services



supply and sanitation and an ambitious restructuring and investment program is underway. However, after ten years this program has not yet delivered service improvements to the Palestinian people. In fact, over the last 20 years, Palestinian access to internal renewable water resources has deteriorated sharply and water services in many locations have deteriorated, particularly in Gaza.

Palestinian water services in both West Bank and Gaza risk becoming entrapped in a vicious cycle – a cycle of inadequate water availability, poor services, and consumer disengagement and failure to pay, leading to deterioration of the financial position of service providers, demoralization of staff and stakeholders, and further decline in capacity and performance (figure ES.7). Some Palestinian service providers have already descended far into this spiral of degradation. Although there is not necessarily a connection with domestic or regional political tensions, these also present risks.

The current deterioration needs to be reversed. Despite the extraordinary efforts of the PA and the Palestinian people, water security is slipping away. If it is not to pass entirely out of reach, something more – and something different – needs to be done. Palestinians deserve secure water sources and a modern service delivery system matching that enjoyed by Israelis. This calls for a decisive shift to a new culture that asserts Palestinian rights to water security, and in particular to decent water and sanitation services for all.[4]

A Progressive and Integrated Framework is Needed that Combines Institutional Change with Steps to Address Bulk Water Availability and Promote Investment, and is Aligned with Incentives – the IWII Framework

The IWII framework places a priority on *institutional change*, moving progressively toward full implementation of the 2014 Water Law. The framework also works toward essential increases in *bulk water availability* and *investment*. All three components need to be integrated with *incentives* for all stakeholders to implement change. This integrated framework is a practical and progressive way to improve performance and accountable service delivery, provide adequate water, and attract investment that will actually deliver affordable quality water supply and sanitation services for West Bank and Gaza.

Make Institutions Accountable and Efficient (the First "I" of the IWII Framework)

The sector reforms already agreed upon put the citizen first by prioritizing sustainable, efficient, and equitable provision of water and sanitation services.

- **At the central level**, the priorities are: transferring all mandated functions to WSRC; quickly establishing the National Water Company (NWC), with clear definition of its roles and responsibilities; and conducting a mid-term review of sector reform objectives, strategy, and implementation. The purpose of the mid-term review would be to ensure alignment between PWA, MoLG, the Ministry of Finance and Planning, and other stakeholders, including service providers and consumers, and to clarify roles and responsibilities for the transition period.

- **At the local level**, the pathway is for progressive movement of service providers toward increased accountability and financial and managerial autonomy. Institutional provisions need to ensure accountability both upward to the central government and downward to consumers; financial and managerial autonomy; and financial management and accounting to internationally recognized standards so that service provision can be run on a business-like basis. Sufficient incentives need to be built into the system for enhancing institutional performance of service providers by making sector financing performance-based; and putting in place robust monitoring and evaluation systems.

- A **time-bound transitional plan** is required, given the slow pace of reform to date. Moreover, the water sector has much to learn from what has and has not worked with the energy sector reforms in West Bank and Gaza. Given the many parallels between water and energy reforms, engagement between PWA, MoLG, and development partners with energy sector professionals at the higher and local level would help devise an incentive structure that takes into account the political economy factors.

- **Priority objectives** would be to: (1) transform the current web of hidden subsidies that incentivize bad performance into systemized targeted support that rewards good performance; (2) launch the two pilot projects (North Jenin and Salfeet) proposed by PWA to test application of the provisions of the Water Law for establishing utilities; (3) initiate the dialogue on how to provide stable and predictable financing for investment; and (4) provide templates and support programs for different models of institutional transformation within the overall framework of the 2014 Water Law.

Address the Bulk Water Challenges (the "W" of the IWII Framework)

A clear plan is needed for procuring and distributing adequate potable water equitably and for developing the needed bulk infrastructure.

For West Bank, the imperative is getting more water and distributing it fairly.

- **PWA should lead a governmental process of planning for supply and demand and the PA should engage in a political process of negotiating for extra water resources.** A top priority is to negotiate with Israel for extra water. The support of the international community is needed to facilitate the agreement and to monitor its implementation. The negotiation should cover both internal resources and cross-border water transfers, and the right of the PA to develop and manage water supply and sanitation infrastructure within Area C. At the same time, existing groundwater resources need to be husbanded and wastewater reused wherever feasible.

- **There is a need for realistic planning.** The West Bank water master plan and the investment plan to develop the bulk water network need to consider the ongoing challenges, not present aspirational statements about recovering control over natural resources. Multiple plans prepared to date, including PWA's recent Strategic Development Plan (SDP) for the water sector, aim too high.

- **The NWC needs to be established quickly and to be run on a business-like basis.** The NWC would play the key role in the equitable and efficient distribution of bulk water, including the expected extra water from Mekorot, and would be responsible for planning and developing the extra infrastructure required to distribute this water. The proposed corporatized structure of the NWC offers prospects of depoliticizing the bulk water issue, and of putting bulk water supply onto a financially sustainable footing.

- **Transparency and broad stakeholder involvement would increase ownership and strengthen the planning process.** Citizen and stakeholders at the local and higher level should be brought in to discussions on the water master plan and investment program.

For Gaza, the imperative is to develop practicable plans for potable water.

- **Studies on delivery of large-scale desalination are at a decisive stage, and decisions need to be taken in the light of financial, economic, and implementation feasibility**.

- **It would be worthwhile to look at other options for the short and medium term (five to seven years).** This could include support to regulated private sector desalination, perhaps on an output-based aid (OBA) basis. In addition, a nongovernmental organization or a municipality could run one or more medium-sized desalination plants similar to the plant recently constructed by the United Nations Children's Fund (UNICEF). These options could be combined with the possibility of twin potable/nonpotable networks. It might also be possible to nurse parts of the aquifer back to health.

- **Another option is further purchases from Israel.** A further 12 MCM annually is under negotiation in the context of the Red-Dead memorandum of understanding.

- **A bulk carrier and distributor (the National Water Company) is also needed for Gaza, both for water purchase and distribution and to run desalination.**

Increase Investment and Integrate it within the Framework (the Second "I" of the IWII Framework)

Investment needs to be efficient and prioritized within agreed plans that have been debated with citizens.

- **The entire planning, budgeting, financing, and implementation cycle needs to become better integrated to respond to realistic goals**, with central priorities linked to local plans.

- **Realistic master planning** needs to be interpreted in the form of a national investment plan that reconciles national priorities and realities with local needs and stakeholder views and that includes bankable projects that integrate institutional change and equitable water availability for all citizens into investments.

- **Investment needs to be focused on priorities**, particularly on reducing inequality of access in West Bank and on solving the Gaza water crisis, including updating the 2012 Investment Program for Gaza. Strengthening citizen engagement in the investment

planning process by institutionalizing consultations and participative planning will enable sector investment plans to be more inclusive, as well as better reflect the priorities of citizens and customers.

- **Investment is needed not only in infrastructure but in institutional change and strengthening and in capacity building.** To enable the alignment of investments with institutional reform and capacity building, it is important to reform the sector's financing model. Instead of input-based investment decisions taken in a top-down manner, performance-based fiscal transfers or output-based aid should be adopted. Within this framework, the PA should provide transparent and predictable financing to those service providers that meet specified institutional performance benchmarks and service delivery outcomes.

- **Private investment needs to be brought in wherever possible.** A greater role for the private sector would be an efficient approach, where capacity and comparative advantage exist. PWA needs to implement its new framework for public-private participation. Specific opportunities for public-private partnerships (PPPs), such as smaller-scale desalination in Gaza, need to be actively explored.

The First Three Components (Institutional Change, Water Resources, and Investment) Need to be Integrated with a Fourth – Incentives for All Stakeholders (the Third "I" of the IWII Framework)

- **The partnership between PWA and donors needs to be renewed.** Donor buy-in to a coordinated IWII approach is essential to ensuring that the program is implemented as agreed. Donors need to partner with PWA constructively to prepare realistic sector development plans. Donors also need to harmonize and align their support to the Palestinian water sector. Some form of sector-wide approach, with strong coordination mechanisms and forums for dialogue, is indicated.

- **All elements – institutional change, water supply, and investment – need to be integrated and linked to results at the local level.** Residents in a town who today receive network water once a month want to see – and be involved in – an integrated plan for IWII that will provide adequate bulk water, improve the efficiency and accountability of their service provider, ensure that all parties are on board with the plan, and bring investment that will actually deliver affordable quality service out of the tap.

- **No change can take place unless the government and people of West Bank and Gaza are motivated.** Incentives need to be aligned. Within the PA, agencies and decision makers must be convinced that change is in the interest of citizens and the territory, and that it is affordable for a lower-middle-income economy. At the local government level, municipalities and village councils must be convinced that change will bring better services at an affordable cost and that local government finances will not be adversely affected. Service providers and their staff need to be motivated. Being empowered and enabled to provide a good service is the most powerful incentive in this regard. Consumers need to see how they will be better off as a result of the changes – and that they are empowered in the process, not just to complain but to debate and affect outcomes. Donors need to see how their investment can be aligned and harmonized within a coherent plan that will deliver sustainable, improved services for Palestinians.

- **Change needs to be a directed but inclusive process, with PWA in the driving seat.** Change needs to be built around practical, demand-driven programs for IWII – institutional change, water supply, investment, and incentives – debated by all stakeholders. PWA is

the leader, conceiver, planner, guide, and facilitator of all this and will need strengthening to be able to carry out these functions. At the level of service providers, PWA and MoLG will need to provide guidance and support to the preparation and implementation of IWII plans, and will need to be strengthened to carry out this role.

- **Incentives for local government units (LGUs) to participate in reforms need to be sharpened by separating the issue of their financing needs from the responsibility for delivering water supply and sanitation services.** Issues of municipal finance reform need to be aired, but improvement of water service delivery should not be hostage to solution of the problem of how best to finance municipal budgets.

- **There is an opportunity to use IWII to incentivize and accomplish reform.** For example, investment, combined with assurance of adequate water supplies, can be prioritized toward service providers that are already undertaking institutional reform or are ready to reform. This could form the basis of a demand-driven, output-based approach to sector reform and investment.

Act Now! Do Not Let the Best be the Enemy of the Good

- **Dialogue and transparency at all levels will improve ownership and outcomes.** PWA and MoLG need to engage in dialogue together and with service providers, stakeholders, and donors to review ways to improve service delivery and to provide the evidence base for good policy decisions. The PA, with the support of international partners, needs to engage with Israel to pinpoint areas of cooperation, particularly on water resources development and on bulk water supply, as well as on treatment of sewage. Platforms for dialogue need to involve the donor community to strengthen harmonization and alignment of donor programs with national strategies.

- **The agreed reform path should be constantly questioned and reconfirmed.** Incremental initiatives along that path are possible and good. Just because the NWC or regional utilities are not yet in place does not mean that a service provider should not implement change that will improve accountability and financial and managerial autonomy.

- **The WSRC and the benchmarking work that has been done to date should continue to be strengthened.** Making service provider performance data available is currently providing service providers with soft incentives to modify behaviors. Service providers now have benchmarks and information about comparators and can seek exchange of experiences with other providers. WSRC, PWA, and MoLG can use these data to understand variations in performance among providers and to identify and prioritize engagement with poor performers. In addition to the benchmarking data, PWA and MoLG should also take advantage of the new Local Government Performance Assessment (LGPA) to understand priority areas for engagement in locations where water supply and sanitation services are deficient.

- **The best should not be the enemy of the good – there is much that service providers can do now without waiting for major reform or investment.** For example, accountability, transparency, and financial stewardship can be greatly improved by the adoption of robust financial management systems in place of municipal accounting. Service providers can keep water revenues separate and can account for depreciation and surpluses. They can set targets for reduction in non-revenue water, adopt computerized billing systems and policies for bad debts, and outsource debt collection. The nascent collaboration among service providers within the Palestinian Union of Service Providers offers excellent opportunities for cross-fertilization and exchange of best practice.

Table ES.1 summarizes the way forward.

Table ES.1: Constraints and Options for Improving Palestinian Water Security and Providing More Sustainable, Affordable, and Equitable Water Services

The problem	The causes	Current solutions	This Diagnostic's recommendations
Relaxing institutional and financial constraints			
Water services are embedded in local government, not in the water sector. Hence: • Accountability between PWA/WSRC and service providers (SPs) is weak. • Local government units (LGUs) use water resources as a source of finance. • LGUs do not pay their bulk water bills (the net lending problem). • SPs have high non-revenue water and low collection rates.	• MoLG/LGUs have no incentive to make water services autonomous or their accounts transparent. • Lacking alternatives for municipal finances, MoLG/PA tolerate net lending, creating perverse incentives and an inequitable subsidy. • SPs lack means and incentives to improve performance.	• Encourage establishment of autonomous SPs. • Consolidate water services under larger regional utilities with economies of scale.	Establish and implement a time-bound, incremental action plan to: • Set out alternative pathways toward improved service provision and corporatization • Provide (revenue-neutral) incentives and investment to LGUs/SPs that are willing to move toward autonomous status • Activate the full power of WSRC and bring SPs fully under the regulatory umbrella of the water sector • Thoroughly analyze the net lending challenge and promote municipal finance reform.
Relaxing bulk water constraints			
West Bank: • Internal water resources are insufficient and dwindling, • Half of the internal resource base is allocated to agriculture. • Distribution of the internal resource is unequal. • Wastewater treatment (WWT) or reuse is scant.	• Article 40 and movement and access (M&A) restrictions constrain bulk water supply. • Agriculture and Area C viable need to be kept viable. • Wastewater solutions are very costly and constrained by Area C restrictions.	• Revive the Joint Water Committee (JWC). • Negotiate further water purchase. • Transform WBWD into NWC over time. • Integrate WWT and reuse.	• Ensure that planning for supply and demand is realistic. • Engage in dialogue with all stakeholders on overall water security. • Set up NWC now. • Integrate WWT and reuse.
Gaza: • Water is not fit to drink. • Overdraft and depletion seems unstoppable. • Wastewater is treated but not reused.	• The internal political situation and PWA's loss of control complicate solutions. • Wastewater reuse solutions are very costly, of lower priority, and heavily constrained by M&A restrictions.	• Desalination. • Wastewater reuse.	• Decide on desalination and purchases. • Set up NWC now. • Support and regulate private provision of water supply services. • Support medium-scale desalination. • Promote wastewater reuse.

box continues next page

Table ES.1: Continued

The problem	The causes	Current solutions	This Diagnostic's recommendations
Relaxing planning, investment, and financing constraints			
• Investment plans are very ambitious. • Private sector participation is limited. • Project implementation is delayed.	• There is no clear planning mechanism, and LGU/SP and citizen engagement in the process are weak. • Donor financing is not integrated in a coherent prioritized planning framework. • Movement and access are restricted within a fragile context.	• There are multiple strategic plans without prioritization.	An integrated planning process, including: • Realistic master planning for bulk water • Participation of LGUs/SPs and citizens • Integrated planning (IWII) • Prioritization (of bulk water, reducing inequalities, improving the worst services) • Restructured PA/donor partnership.
Relaxing political economy constraints			
Problems with geopolitical causes include: • Limited room for maneuver in West Bank to develop water resources or construct infrastructure • No agreement with Israel on water sector development in West Bank and Gaza. • Extreme implementation constraints for water infrastructure and major energy constraints for operations in Gaza.	• Article 40 of the interim Oslo Accords of 1993 gives Israel a veto over West Bank water sector development. • JWC de jure control of development is exacerbated by de facto control by the Civil Administration, especially in Area C. • In Gaza, movement and access restrictions give Israel a veto on water sector infrastructure and operations.	• Revive the JWC and try to get agreement for bulk water purchases and for infrastructure development.	• Engage international political support in dialogue with Israel to attain Palestinian water security. • Discuss coherent integrated planning with Israel in the JWC.
Problems affecting West Bank with internal political causes: • Lack of buy-in on the 2014 Water Law and reform plan	• Divergence between PWA's water services objectives and MoLG's municipal financing objectives	• Enter into a MoU between PWA and MoLG.	• Refresh national debate on reforming the water supply and sanitation sector. • Reform municipal finances.
Problems affecting Gaza with internal political causes: • Groundwater overdraft and salinization • Effective operation of the CMWU as a service provider • Nonpayment for bulk water	• Scant cooperation between Hamas and the PA • Two PWAs in Gaza	• The recent Hamas/Fatah reconciliation plan for a national unity government.	

Source: WASH-PD team.
Note: CMWU = Coastal Municipalities Water Utility; IWII = institutions, water supply, investment, and incentives; JWC = Joint Water Committee; JWU = Jerusalem Water Undertaking; LGU = local government unit; M&A = movement and access; MoLG = Ministry of Local Government; MoU = memorandum of understanding; NWC = National Water Company; PA = Palestinian Authority; PWA = Palestinian Water Authority; SP = service providers; WWT = wastewater treatment.

Notes

1. Article 40 of the 1995 Oslo II agreement recognized certain Palestinian water rights, established water governance arrangements, notably a Joint Water Committee (JWC), allocated specific quantities of the three West Bank aquifers underlying both territories, and made some provisions for future needs. See box 9.1 in Chapter 9.
2. The latest household level poverty estimates are for 2011 and is outdated. The most recent estimates based on PECS 2016/2017 data show that every second person in Gaza was poor, while poverty rate in West Bank was about 13.9 percent (PCBS website). Small area-level estimates are available from 2009. This Diagnostic used them to identify pockets of poverty. Water and sanitation data are more recent. This Diagnostic used data from the 2016 Local Government Performance Assessment Survey (LGPA).
3. The indictor for collection rates, as defined by the Water Sector Resources Council (WSRC) "measures the percentage of total collections from water bills issued during current (reported) year and from outstanding billing balances from previous years compared to billed water sales for the current (reported) year."
4. This was effectively recognized by Israel under Article 40 of the 1995 Oslo II agreement, which recognized Palestinian water rights, and returned some West Bank water resources and services responsibility to the Palestinian Authority. For details about Article 40, see box 9.1 in Chapter 9.

Reference

Vishwanath, Tara, Brian Blankespoor, Faythe Calandra, Nandini Krishnan, Meera Mahadevan, and Mobuo Yoshida. 2014. *Seeing is Believing: Poverty in the Palestinian Territories*. Washington, DC: World Bank Group.

Introduction

The Water Supply, Sanitation and Hygiene Poverty Diagnostic

The Water Supply, Sanitation, and Hygiene Poverty Diagnostic (WASH-PD) for West Bank and Gaza is part of a global initiative to improve evidence on the linkages between water supply, sanitation, and hygiene (WASH), poverty, and service delivery at the local level. The Diagnostic identifies the distribution of poverty in the Palestinian territories, assesses how equitably water supply and sanitation services are distributed, brings new evidence on the transition from the indicators of the Millennium Development Goals (MDG) to the more comprehensive ones of the Sustainable Development Goals (SDG), and examines the binding constraints to improve service delivery.[1] An important focus of this Diagnostic is water scarcity–not only because of its importance to service delivery, but also because efficient service delivery is part of the equation to achieving water security for West Bank and Gaza.

What are the Focus and Aims of this Diagnostic?

This WASH-PD focuses on ways of improving access and delivery of WASH services. It seeks to identify challenges and opportunities to improving access, and to the extent possible, the quality and sustainability of WASH services, with a focus on areas where the poor live. It maps the existing institutional and financing arrangements in the water supply and sanitation sector with the objective of assessing the extent to which these contribute to the delivery of efficient and accountable services to citizens.

This Diagnostic is presented against the backdrop of the Palestinian Water Sector Strategic Development Plan (SDP) 2017–2022 and the 2014 Water Law, which aim at improving water security and service delivery. The WASH-PD aims at filling information gaps on service delivery constraints and opportunities. The audience for this report is the range of stakeholders concerned with improving service delivery, including the Palestinian Water Authority (PWA), the Water Sector Regulatory Council (WSRC), the Ministry of Local Government (MoLG), the Ministry of Health (MoH), the Ministry of Finance and Planning (MoFP), donors, nongovernmental organizations (NGOs), private sector actors, concerned citizens, and action groups.

The Diagnostic can inform the design and implementation of solutions financed by the World Bank to improve the provision of water supply and sanitation services in West Bank and Gaza. It will also provide an analytical basis for the preparation of a new programmatic approach by the World Bank to support the water supply and sanitation sector.

The focus of the report is on water supply services, although the report briefly describes the current situation and key issues in the sanitation and wastewater sector.

What is Water Security and Why is it so Important for Palestinians?

West Bank and Gaza is a very water-scarce lower-middle-income territory with a relatively water-dependent economy and is vulnerable within its geopolitical setting; thus, assuring water security is a priority. Water security requires adequate water resources that are well managed, including management of risks, and water services that provide sustainable, efficient, and equitable access to and quality of water supply and sanitation (see box I.1).

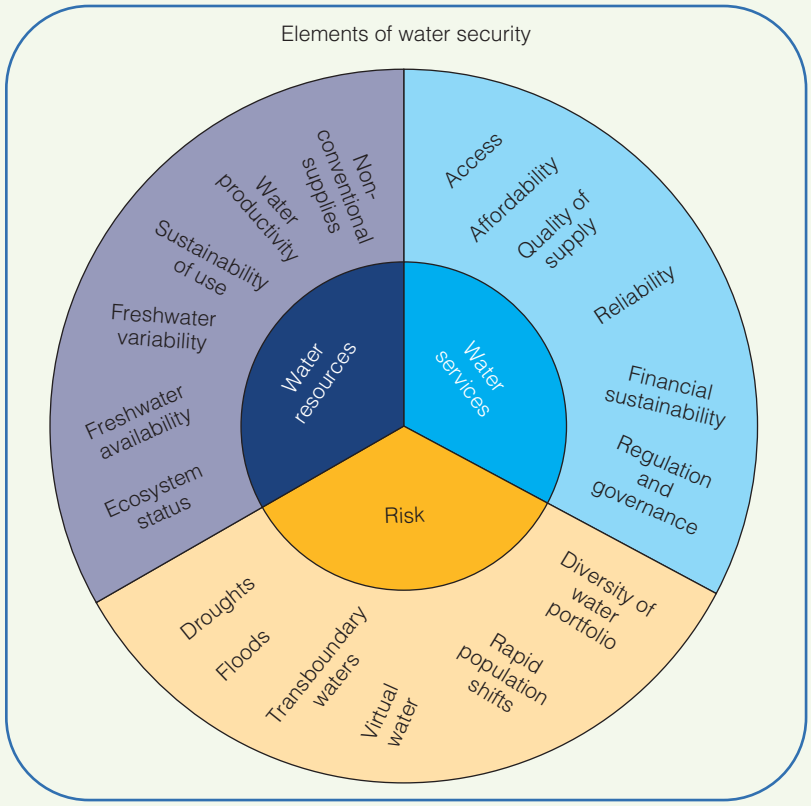
Despite the extraordinary efforts of the Palestinian Authority and the people of West Bank and Gaza, water security is slipping away. If it is not to pass entirely out of reach, something more – and something different – needs to be done. The people of West Bank and Gaza deserve a

Box I.1: What Is Water Security?

Water security has three interdependent components. First, *renewable water resources* in a given location or territory must be available in adequate quantity and quality to meet all current and future needs for water used efficiently and productively in domestic, industrial, commercial, hydropower, and agricultural activities. Water resources must also be available to meet ecosystem, amenity, and navigational uses, and their development must be consistent with norms of environmental protection.

Second, *risks to water resources* must be managed, including climate-related risks such as drought, floods, or variability of liquid water and groundwater; institutional risks such as upstream-downstream and transboundary conflicts of interest or unregulated abstraction and pollution; and demographic risks such as unmanaged shifts in demand.

Third, *water services* to all uses must provide equitable, sustainable, and affordable access and quality of supply through viable, regulated institutions.



modern service delivery system matching that enjoyed by Israelis. What is needed is a decisive shift to a new culture that asserts Palestinian rights to water security, and in particular to decent water supply and sanitation services for all. That is the focus of this WASH Poverty Diagnostic.

Note

1. While the global initiative also looks at the linkages of WASH services with other sectors such as health and education, this was not possible in the context of West Bank and Gaza because of data limitations.

Part 1

The Palestinian Water Supply, Sanitation and Hygiene (WASH) Sector

Drinking Water (Standpipe Used to Fill Water Bottles) in Gaza

Palestinian Water Authority's Communication and Media Department.

Part 1 of this report examines the current situation in West Bank and Gaza's water supply, sanitation and hygiene (WASH) sector. Chapter 1 describes current policies, sector investment, and financing; the provision of water supply and sanitation services; and bulk water sources and supply. Chapter 2 examines the relationship between water supply, sanitation and hygiene (WASH) and poverty in West Bank and Gaza. Chapter 3 examines the access and quality of WASH services, using new data and analysis generated for this Diagnostic.

Chapter 1
The Palestinian Water and Sanitation Sector

Policy and Reform

Palestinian policy has been to provide quality and affordable water supply and sanitation services to all the people of West Bank and Gaza. Since control over water resources, infrastructure, and services in West Bank and Gaza was transferred to the Palestinian Authority (PA) under the Oslo Accords of 1995, the policy has been to connect all households to continuous potable water supply, to safe sanitation and sewerage networks, and to wastewater treatment; to supply services of adequate quantity and quality to all at an affordable price; and to provide the service through efficient and financially viable service providers.

Following the signing of the Oslo Accords, connections improved considerably. At the time the Accords went into effect in 1995, about 87 percent of the West Bank population was connected to water supply and about 31 percent to sewerage networks. Today 93 percent of households in West Bank are connected, although network sanitation rates have only kept pace with population growth. Connection rates in Gaza are also high for network water (93 percent) and much higher for network sanitation (78 percent).

However, the quality of service did not keep pace with connection rates. In the early 2000s, the Palestinian Water Authority (PWA) identified a series of constraints to services: pressing water scarcity, a growing imbalance between supply and demand for water, and emerging problems at both the bulk and retail service levels. Water service was often intermittent, physical losses were high, and service provision was uneven across the territories, with many consumers facing high costs and low quantities of water. A key concern was the plethora of service providers, over 300 in total of varying sizes and performance levels.

In 2009, PWA started taking steps toward the comprehensive reform of the water supply and sanitation sector, but the reforms are being implemented only slowly. PWA led a process of debate and study throughout the Palestinian territories, which resulted in agreement in 2009 on the need for comprehensive sector reform based on best-practice guiding principles. Sector reform was mandated by a 2009 Action Plan for Reform and enshrined in the 2014 Water Law, which provided for establishment of an independent regulator, a national water company, and consolidation of services under regional utilities. Implementation of the Water Law is underway, but has encountered constraints. The bulk of the reforms are planned to be completed by 2022. In the meantime, services continue to be provided largely by service providers under the aegis of the Ministry of Local Government (MoLG).

The Current Status of Institutions

Central Agencies

At the central level, four state actors have responsibilities for the water supply and sanitation sector. The *Palestinian Water Authority (PWA)* is in effect the Palestinian water ministry. Under

the 2014 Water Law, PWA is responsible for policy and legislation, for water resources allocation and protection, and for investment planning. PWA has received extensive capacity building support over the last decade under a program supported by several donors. PWA has a branch in Gaza, but its effectiveness has been constrained by a parallel PWA set up by the Hamas administration.

The *Water Sector Regulatory Council (WSRC)* was set up under the 2014 Water Law with the mandate of sector regulator, approving tariffs, licensing and regulating service providers, and protecting consumers. Most of these statutory functions have not yet been legally transferred to WSRC. Its main activity to date has been data gathering, which has constituted a time-series on the performance of service providers. Monitoring of service provider performance, which was initiated by PWA, is currently led by WSRC in cooperation with PWA.

The *Ministry of Local Government (MoLG)* supports, monitors, and regulates local government units (LGUs), which were assigned responsibility for providing water supply and sanitation services under the 1997 Local Government Law.

The *Ministry of Finance and Planning (MoFP)* allocates sector finance and manages financial flows.

Bulk Water Supply

In West Bank, bulk water provision is the responsibility of the *West Bank Water Department (WBWD).* It manages wells and purchases water from Israel, and distributes and sells bulk water to service providers. In Gaza, no bulk provider exists. The 2014 Water Law provides for the establishment of a National Water Company (NWC) on a business basis (on similar lines to the Israeli company Mekorot) that would be the bulk provider for both West Bank and Gaza. In March 2016, PWA drafted a road map (the National Water Company Draft Action Plan) for setting up the NWC by a phased transformation of the WBWD into the new company, but no decision has yet been made to implement the road map.

Retail Water Supply and Sanitation Services

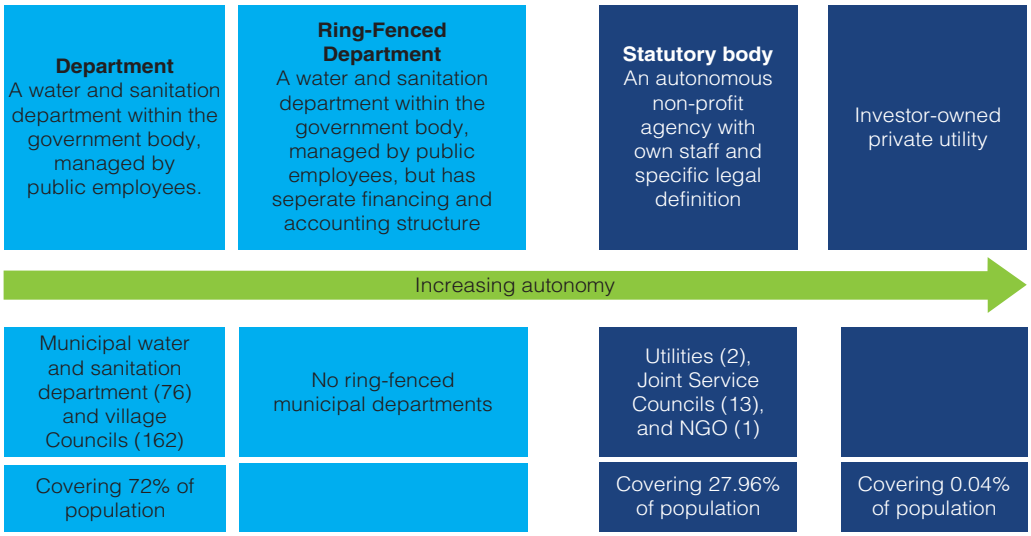
Retail water supply and sanitation services are provided by a range of service providers. In West Bank, about one-quarter of the population is served by two formally established autonomous "utilities." Each is established under its own statute and reports to a board made up of the local government units that own it. The *Jerusalem Water Undertaking (JWU)* provides water services to East Jerusalem and surrounding communities, and to much of Ramallah and Al Bireh governorate. The *Water Supply and Sanitation Authority (WSSA)* provides water services to the Bethlehem area.

The rest of the West Bank population and all Gaza households are serviced by providers under the aegis of the MoLG. Larger towns have *municipal water departments (WDs),* which provide water and/or sanitation services (76 in West Bank and 25 in Gaza). In West Bank, many smaller municipalities and villages have joined together to form *Joint Service Councils (JSCs)* (13 to date), which provide water and/or wastewater services. Some 162 *Village Councils (VCs)* also deliver water and wastewater services. Figure 1.1 presents a typology of service providers in West Bank, increasing in autonomy from the left of the figure to the right.

Nonstate Providers

Services to some refugee camps are provided by the United Nations Relief and Works Agency for Palestine (UNRWA), while in West Bank and to a greater extent in Gaza, there is an active private sector of water purifying plants and private water tankers (see box 1.1). In West Bank, there is one purely private network provider (in the Rawabi luxury housing complex), but it serves only a few hundred consumers. Institutional arrangements in West Bank are summarized in figure 1.2.

Figure 1.1: Typology of West Bank Service



Source: WASH-PD team.
Note: NGO = nongovernmental organization.

Box 1.1: Private Provision of Desalinated Water by Truck in Gaza

Currently, more than 90 percent of Gaza's inhabitants access water from two sources: network water supplied by the municipality; and truck water provided by private suppliers. Almost all Gaza residents find municipal water too salty and impure for human consumption and use it only for cleaning and gardening. By contrast, desalinated water is appreciated for its taste and quality and is used by almost everyone for drinking and cooking. It is estimated that truck water represents 97 percent of the water used for drinking and 67 percent of the water used for cooking purposes in Gaza. A rising number of costumers say they also use desalinated water for bathing and *'udud* (ablutions). The typical household spends about the same amount on each source: NIS60 ($15) every month on both network water and water from tankers.

The truck water market in Gaza Strip comprises over 100 small-scale independent providers, up from about 20 since 2010. Providers fall into three categories: private businesses running one or several reverse osmosis (RO) plant(s) and a fleet of trucks; private businesses comprising only trucks (or a single truck) and purchasing bulk desalinated water from the RO plants; and public bodies, NGOs, educational institutions, and aid agencies such as UNICEF running RO plants. In 2015, 154 RO plants were reported in Gaza, and there were 106 associated businesses distributing water through trucks. Of the 154 plants, 45 percent were private, 29 percent were NGOs, 19 percent were public, and 13 percent were run by educational institutions. Two-thirds (68 percent) of the plants are not licenced and 40 percent use water from unlicensed wells. The daily production of all RO plants in Gaza is 13,128 m^3 in summer and 8,656 m^3 in winter, equivalent to 4 million cubic meters (MCM) per year (PWA 2015a), compared to 95 MCM/year supplied through the network from municipal wells and 9 MCM/year supplied by Mekorot. Sales are about NIS130 million a year ($35 million). Employment in the plants and trucks is estimated at about 1,500–2,000 full-time jobs.

box continues next page

Box 1.1: Continued

Private water production (RO) and transport is based on a simple business model: extraction of brackish water from deep wells (largely private wells located within the operation's site); desalination of this brackish water with small RO plants imported from Israel; and distribution of this desalinated water within a 2–5 km radius around the plant through water trucks carrying 5–10 cubic meters (m^3) (a small number of standpipes also supply water) (photo 1.1). Customers (mainly households) typically buy 250–500 liters of water once a week, and store it inside the house. Some poorer customers buy drinking water from supermarkets in 20-liter jerry cans. All customers are ready to pay a relatively high tariff for this service (NIS30–35/m^3, \$7–9/m^3), much higher than the tariff of municipal water in Gaza (NIS1.5–3/m^3, less than \$1/m^3).

Most of the wells used by private water producers are connected to the national power grid. However, because the power supply is not always reliable, most producers also have a standby generator. Few suppliers chlorinate their water. A PWA/WASH Partners/GIZ (2015) study found that although most plants are monitored (59 percent by the Ministry of Health), "nearly half the RO plants produce contaminated water (total coliform)." Tankers and storage tanks in supermarkets and domestic dwellings are rarely properly cleaned.

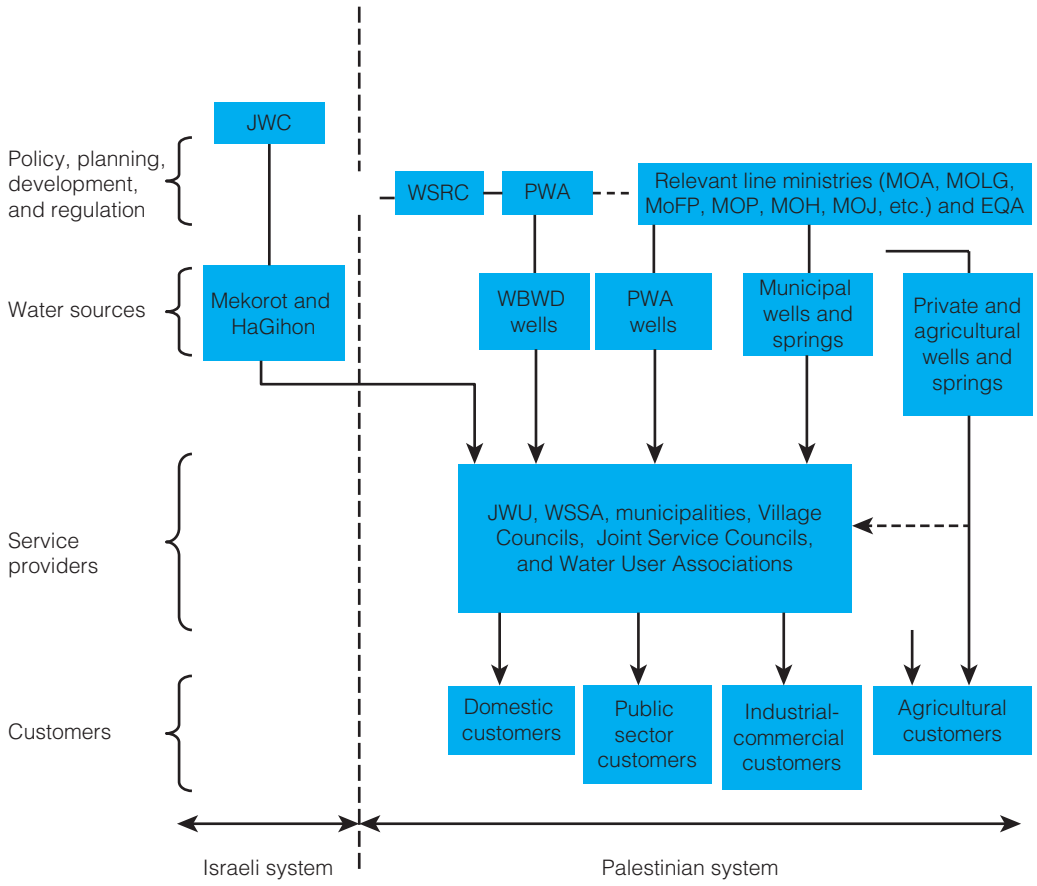
Overall, Gaza customers are satisfied with the service and are ready to pay for it, stressing water quality and ease of access. The small quantities involved do not pose problems of storage. The Hydoconseil (2016) study concludes that "whatsoever the evolution of the political and institutional context in the Gaza strip, the private desalination and truck delivery business will continue to grow into the medium term." PWA accepts that this coping strategy is the only practical solution for the time being, and that it provides water security at the household level. PWA's main concern is water quality, with the recommendation that the water be chlorinated at both the plant and household level.

Sources: PWA/Hydroconseil 2016; PWA/GIZ 2015; PWA/WASH Partners/GIZ 2015; GIZ/PWA/CEP 2015.

Photo 1.1: Water Truck and Filling Station in Gaza

Source: Palestinian Water Authority's Communication and Media Department.

Figure 1.2: Institutional Arrangements in the Water Sector in West Bank



Source: WASH-PD team.
Note: EQA = Environmental Quality Authority; JWC = Joint Water Committee; PWA = Palestinian Water Authority; WBWD = West Bank Water Department; WSSA = Water Supply and Sanitation Authority; WSRC = Water Sector Regulatory Council.

Planning and Investment

PWA is responsible for establishing central plans, budgets, and targets and for investment programming and financing. Currently, some 114-water supply and sanitation projects are being implemented, valued at nearly NIS3 billion ($770 million). Three-quarters of the costs (76 percent) are financed by donors. The high level of external finance is the major reason for the improvements in access to water supply and sanitation services since the Oslo Accords went into effect. Investment selection and implementation are, however, subject to numerous constraints related to the regional political situation, including decisions in the Palestinian/Israeli Joint Water Committee (JWC) and movement and access restrictions imposed by Israel.[1] In May 2016, PWA produced the *National Water Sector Strategic Plan and Action Plan (2017–2022)*, which includes an investment program that is massive in terms of finance required ($1.25 billion for 240 projects) and in its demands on implementation capacity.[2]

Recurrent Financing and Subsidies

Tariffs and How They Are Set

In West Bank, bulk tariffs are set by PWA/WBWD and retail tariffs are set by service providers. The *tariff for bulk water* is set by the West Bank Water Department (WBWD). It is currently

below cost. WBWD has set the selling price at the level of the purchase price: NIS2.60 per cubic meter (m^3). However, as of 2014, WBWD's total costs were NIS3.04/m^3. Thus, there is a 20 percent loss to WBWD (and therefore a 20 percent subsidy to service providers) on bulk water sales. Service providers (SPs) set *tariffs for retail sales* and recover their costs by billing consumers. Tariffs, billing, and collection rates vary, but are generally low, reducing revenue for operation and maintenance (O&M).

New tariff by-laws and methodology have been approved, but WSRC's role in regulating them is not yet operational. A new regulatory framework for tariffs was established by the *Water and Wastewater Tariff By-law* approved by PWA in January 2013. The methodology was set by the *Water and Wastewater Tariff Model* approved by PWA in October 2015. In the future, WSRC is to have responsibilities for approving tariffs under the Water Law. Once the National Water Company (NWC) is established, it will be responsible for proposing a unified price for all bulk supply to service providers throughout West Bank and Gaza.[3] WSRC will be responsible for approving both this bulk tariff and the retail price proposals submitted by service providers. The approval system has not started, but WSRC has been conducting a number of tariff studies on behalf of SPs.

Effective Subsidies and Non-payments

In practice in both West Bank and Gaza, overall cost recovery is well below 100 percent. In West Bank, bulk water is priced 20 percent below WBWD's cost of supply. Even so, many service providers do not pay their WBWD bills for bulk water. As a result, the PA incurs a cost of about NIS100 million ($35 million) each year. This effective subsidy to the water sector benefits municipal governments through budget savings, and consumers, many of whom also do not pay their water bills, despite the subsidy (for reasons why, see Chapter 6). In Gaza, the effective subsidy and levels of nonpayment are even higher.[4]

Service Provider Performance

As discussed in Section 1.1, the PA's twin objectives in the provision of water supply and sanitation services are to provide access to good service for all in adequate quantity and quality at an affordable price and to provide the service through efficient and financially viable service providers. This section looks at the supply side, assessing how well service provision in West Bank and Gaza achieves the twin objectives. Chapter 3 reviews outcomes from the demand side.

Measuring the Quality of Water Supply Service – A Review of Key Performance Indicators

You cannot manage what you cannot measure. This discussion assesses access, quantity, quality, and affordability based on available data. Selected performance measures are presented in table 1.1. Using WSRC data, the table shows the average performance and range of performance for the 40 largest service providers in West Bank and all 25 in Gaza.[5] The table also compares Palestinian service provision with the median performance of the more than 1,000 utilities worldwide in the database of the International Benchmarking Network for Water and Sanitation Utilities (IBNET).

Connection rates are high. The reported connection rates of around 93 percent in both West Bank and Gaza compare favorably with the IBNET median of 89 percent. Unconnected households in West Bank are largely in Area C, where movement and access restrictions prevent communities from being connected to the network.[6]

Average quantities delivered are low by global standards, indicating chronic water shortages, but the average figures mask very wide variations. In West Bank, there is a very wide variation among service providers around the average of 80 liters per capita per day (lcd), from

Table 1.1: Water Service Key Performance Indicators (KPIs), 2014

Purpose of KPI	Definition of KPI	West Bank KPI		Gaza KPI		IBNET global median[a]
		Average	Range	Average	Range	
Measuring access	Percentage of households connected to the network	93%[b]	n.a.	93%	n.a.	89%[c]
Measuring quantity	Quantity of water provided each day to households	80 liters per capita	26–242 liters	92 liters per capita	74–114 liters	162 lcd (119–221 lcd)
Measuring quality	Percentage of samples at source free from total coliform	92%	78%–100%	86%	64%–100%	WSRC benchmark for "good" performance: >95%
Measuring affordability	Selling price	NIS5.05/m^3	NIS1.59–NIS7.04	NIS1.90/m^3	NIS0.97–NIS5.20	n.a.
	Water cost as share of GNI per capita	1.30%	n.a.	0.60%	n.a.	0.55%[d]

Source: WSRC, except "'households connected," which is from page 49 of the PWA Strategic Development Plan (SDP), and IBNET data, which are from IBNET Blue Book 2014.
Note: IBNET = International Benchmarking Network for Water and Sanitation Utilities; GNI = gross national income; KPI = key performance indicators; lcd = liters per capita per day; WSRC = Water Sector Regulatory Council; n.a. = not applicable.
a. Based on data for over 1,000 utilities worldwide.
b. These WSRC data on access from the supply side are close to the demand side data from the MICS and LGPA.
c. IBNET Blue Book, table 1.1.
d. IBNET Blue Book, table 1.14.

26 lcd – a level scarcely more than the survival minimum for drinking, cooking and personal hygiene – to a very high 242 lcd. In Gaza, average quantities delivered (92 lcd) are slightly higher, but still well below the global range recorded in IBNET. Amounts vary among service providers, from 74 lcd to 114 lcd, but much less dramatically than in West Bank. However, these findings from WSRC do not detect the key problem of Gaza water supply – that almost all the water delivered through the network is not fit to drink.

Most service providers deliver water only intermittently, with only half of West Bank households and one-third of Gaza households receiving water daily. Only 30 percent of households in Gaza have daily network water supply, compared to 50 percent in West Bank. Supply in Gaza is also affected by the security situation. During the last conflict in the summer of 2014, most of the population received no network water for several weeks.[7]

Water quality is generally acceptable, but sometimes poor in the West Bank – and undrinkable in Gaza. In West Bank, while groundwater quality is generally acceptable, with localized concentrations of chlorides and nitrates, tap water quality is generally poor. Average quality for coliform (92 percent) in West Bank is poor (< 95 percent) in WSRC's benchmarking, indicating fecal contamination. In Gaza, WSRC data report poor quality with respect to coliform and nitrates. However, they omit the most significant fact about Gaza water supply – the extremely high levels of salt, which make the water undrinkable.

Network (piped) water is moderately affordable, on average, in West Bank and affordable in Gaza, but almost all Gaza households depend on costly tanker water for drinking water. In West Bank, network water costs about 1.3 percent of average per capita income, more than twice the global median of 0.55 percent[8] – but the cost varies widely, depending mainly on the bulk water source and on the efficiency of the utility.[9] In Gaza, network water costs about 0.6 percent

of average per capita income, about equal to the global median, but the cost also varies widely amongst the 25 providers. However, almost all Gaza households must buy tanker water at much higher prices (box 1.1). As supplies increase and service improves, costs are expected to rise rapidly, especially because new supplies at the margin will be priced based on desalination costs.

Measuring the Financial Viability of Water Supply Service Providers – A Review of Key Performance Indicators

Selected measures of the efficiency and financial viability of service providers are presented in table 1.2, using data from WSRC.

Findings on Efficiency

Levels of non-revenue water (NRW) represent a dramatic loss for a very water-scarce economy.[10] Average NRW per service provider in West Bank (29 percent), while not far from the IBNET global median and close to WSRC's benchmark for good performance (<28 percent), ranges widely, from good (12 percent) to very poor (50 percent). On average, NRW in the West Bank equals 267 liters of precious water lost per day for each connection – enough water to increase supply by half. Average NRW in Gaza is very high (38 percent), with a range from just within WSRC's good class (<28 percent) to very poor (53 percent). NRW amounts to a loss of 600 liters per day per connection in Gaza, enough to almost double water supply to each household.

West Bank suppliers have relatively high operating costs, while operating costs for Gaza suppliers are only half West Bank levels. Total operating costs in the West Bank are almost double the IBNET median, putting West Bank toward the bottom of the fourth quartile worldwide. The range is great, with some very expensive providers indeed. The biggest items in variable costs

Table 1.2: Efficiency and Financial Viability Key Performance Indicators (KPIs), 2014

Purpose of KPI	Definition of KPI	West Bank KPI		Gaza KPI		IBNET global median
		Average	Range	Average	Range	
Measuring efficiency	Percentage of non-revenue water WSRC benchmark for "good" performance: <28%	29%	12%–50%	38%	25%–53%	27%[a]
	Operating costs per m^3 of water sold	NIS5.00	NIS1.45–8.07	NIS2.71	NIS0.88–6.89	NIS2.68[b]
	Number of employees per connection	3.4	1.2–7.7			
Measuring financial viability	Working ratio (operating costs/sales – > 1 = deficit) WSRC benchmark for "good" performance: 1–0.95	0.89	0.53–1.22	1.50	0.75–5.75	0.92[c]
	Collection efficiency WSRC benchmark for "good" performance: >95%	68%	51%–100%	37%	5%–56%	

Source: WSRC.
Note: IBNET = International Benchmarking Network for Water and Sanitation Utilities; KPI = key performance indicators; WSRC = Water Sector Regulatory Council.
a. IBNET Blue Book, Table 1.3
b. IBNET Blue Book, Table 1.9. Median \$0.70/m^3 = NIS2.68/m^3; highest quartile, \$0.40/m^3 = NIS1.53/m^3; lowest quartile, \$1.12/m^3 = NIS4.29/m^3.
c. IBNET Blue Book, Table 1.8. The median operating cost coverage was 1.09 = working ratio of 0.92; the highest quartile operating cost coverage was 1.38 = working ratio of 0.72; and the lowest quartile operating cost coverage was 0.83 = working ratio of 1.20.

relate to the costs of water supplied by Israel's bulk water supplier, Mekorot, and to energy and personnel costs. Total costs in Gaza are moderate – only half West Bank levels and equivalent to the IBNET global median – although the range is very wide.

Findings on Financial Viability

In West Bank, some service providers' billings cover their operating and maintenance (O&M) costs but others do not, while in Gaza, service providers on average bill only 50 cents on the dollar, so they are inevitably in permanent deficit. The relation between costs and billings is captured by the working ratio. In West Bank, the average is reasonable (0.89), slightly better than the IBNET media of 0.92, and better than WSRC's rather modest target. However, some service providers have working ratios well above 1: that is, they are billing sales at less than cost, guaranteeing that even if they collect 100 percent of sales billed, they cannot break even. In Gaza, with an average working ratio of 1.50, service providers' costs are on average 50 percent higher than sales. Few municipalities cover their costs. In the worst case, costs are more than five times revenues.

Low collection rates mean that the average West Bank service provider is collecting only 76 cents on each dollar of costs; in Gaza, service providers collect only 24 cents, on average. An average working ratio of 0.89 (equivalent to billing $1.12 for every $1.00 of costs) and an average collection efficiency of 68 percent means that the average West Bank service provider is collecting only 76 cents on each dollar of costs. As a result, almost all West Bank service providers are dependent on alternative sources of finance to cover their operating deficits, and all are dependent on public or donor finance for capital investment or asset replacement. In Gaza, collection efficiency is dramatically low – averaging 37 percent, with one municipality collecting only 5 percent of billings. Even the best performer collects only 56 percent. Combining low collection rates with an unfavorable working ratio, the average Gaza service provider is collecting only 24 cents on every dollar of costs.

Overall, low viability leaves service providers dependent on subsidies, with little room for improving services and with no prospect of attracting private finance. Such low performance on basic viability leaves the entire water supply sector dependent on public subsidy and on donor finance. Most service providers cover their deficits simply by not paying WBWD for bulk water supplies (see Section 1.7). There is no scope for private provision because there is no prospect of profitability and risks are high. Given that supply costs are rising quickly and will be even higher in the future (because extra supplies will be high-cost water from Mekorot or desalinated water), solutions must be found.[11]

Sanitation Services[12]

In West Bank, despite high rates of access to improved sanitation, only one-quarter of wastewater is treated, there is little reuse, and large quantities of untreated sewage are discharged into the environment each year, creating environmental and health risks. The Local Government Performance Assessment (LGPA) Survey (see Chapter 3) found that on average, 94 percent of the West Bank population has access to improved unshared sanitation. However, despite considerable investment in expanding wastewater networks, only 30 percent of West Bank households are connected to sewage facilities and two-thirds are still using cess pits. These create a threat to human health and the environment, with high likelihood of overflow across different types of sanitation (see Chapter 3). Rates of sewage connection vary widely from zero (in Tubas) to 59 percent (in Qalqilya). About one-quarter of the 62 MCM of wastewater generated in West Bank is collected in sewerage networks, and two-thirds of this is treated (about 13 MCM annually). Only about 3 percent of wastewater is reused, although new treatment projects include reuse components. The biggest problem is the 25 MCM of untreated sewage discharged into wadis each year from 350 locations. Some 15 MCM of this raw sewage flows into Israel, where it is treated and reused in agriculture. Israel charges the Palestinian Authority for treating this wastewater. Israel's charge for treating this wastewater in 2015 was over $26 million.

In Gaza, levels of wastewater collection and treatment are higher than in West Bank – but the treated wastewater is subsequently discharged to the environment rather than being reused. Virtually the entire population (99 percent) of Gaza has access to improved unshared sanitation, with 78 percent connected to sewage networks, according to the LGPA (see Chapter 3). About 48 MCM of wastewater is collected in Gaza each year, and over 90 percent of this collected wastewater is at least partially treated. However, plants are overloaded and function poorly, party as a result of underfunding and partly as a result of movement and access restrictions.[13] Partially treated wastewater (25 MCM per year) and raw sewage (7 MCM per year) are discharged to ponds and the sea. Treated effluent is often of poor quality and there is little or no reuse. Unconnected households use cess pits. In the current economic climate, they are not being properly emptied.

There has been considerable investment in wastewater in Gaza, but effectiveness has been restricted by movement and access restrictions and other constraints. In Gaza, wastewater is the largest beneficiary of public investment in water infrastructure. However, wastewater projects are particularly vulnerable to the effects of movement and access restrictions and to energy shortages. Thus, project implementation and subsequent operation have proved problematic. To cite a notable example, the Beit Lahya plant has been under construction for nearly two decades without being completed.

There is a major threat from sewage and treated wastewater in Gaza, and a missed opportunity for wastewater reuse. The high rate of connection to the network and of treatment entails high levels of treated effluent. However, this abundant resource is barely reused. This is currently a neglected water resource and a threat to the environment.

Bulk Water Resources in West Bank[14]

Water Supply Quantities in West Bank are below Target Levels

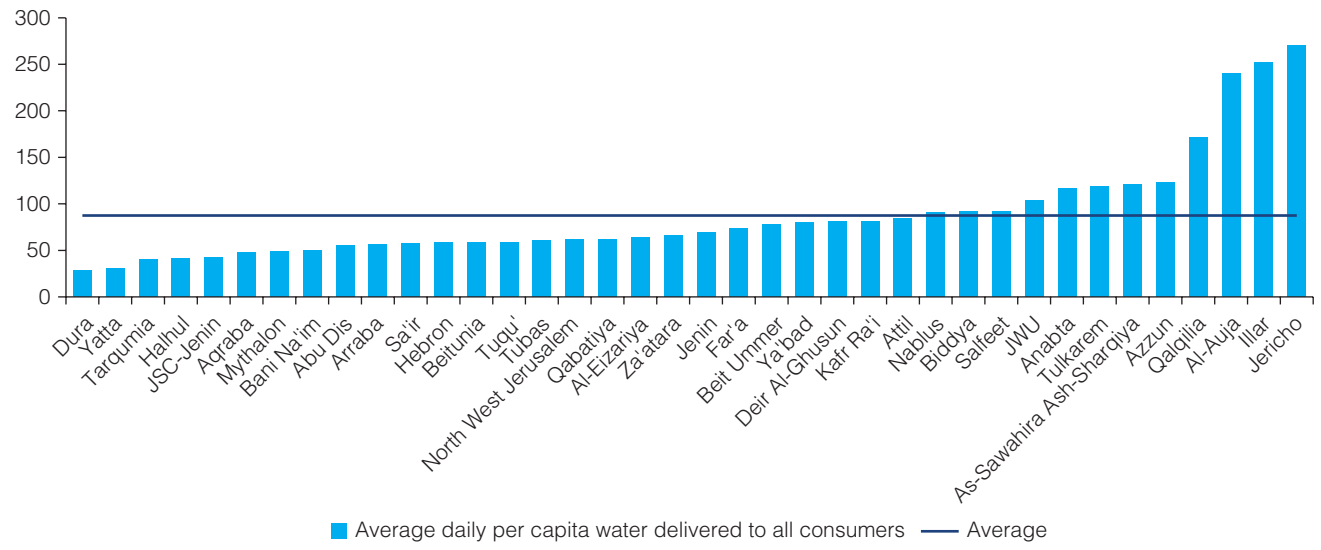
Bulk water provided for municipal and industrial (M&I) uses is about 96 liters per capita per day (lcd), but because of losses only about 80 liters per capita per day is actually supplied, and the amount coming out of the tap is even lower. After the Oslo Accords went into effect, bulk water available for M&I in West Bank initially improved, edging up from 88 lcd to 97 lcd between 1997 and 2005. Bulk water for M&I in 2014 remained at about 98 lcd, despite rapid population growth and shortages of water. However, not all this water actually enters the M&I distribution system, presumably because of losses at the bulk level. The average per capita quantity of water distributed to M&I in 2015 was 80 lcd, according to WSRC data from the 40 main service providers.[15] Taking account of distribution losses at the service provider level, the average amount coming out of the tap is thought to be about 50–60 liters. This is below the World Health Organization (WHO) benchmark minimum of 100 lcd and the PA's target of 120–150 lcd – and far below the estimate for Israelis of 240–300 lcd.

There is wide variation between locations, with extremely low supply in some towns. Figure 1.3 shows the wide variations in domestic supply between the best-served towns like Jericho (257 lcd) and Qalqilya (161 lcd) and the worst served like Dura (28 lcd) and Yatta (27 lcd). In some cases, supply has shrunk markedly: in 2009, Bethlehem was supplying 142 lcd, but by 2015, this had fallen by half to 71 lcd.[16]

Internal Water Resources are Inadequate to Meet Demand, Purchases from Israel are Rising, and Prospects for Obtaining New Supplies are Uncertain

Per capita *internal* resources for domestic water supply in West Bank have shrunk considerably – to just 40 liters per capita per day, so that there is a structural deficit and growing dependence on

Figure 1.3: Average Daily per capita Water Delivered to All Consumers, West Bank, 2015



Source: Water Sector Regulatory Council.

Table 1.3: Sources and Uses of Water in West Bank, 2013

	million m^3	%	M&I	%	Agriculture	%
M&I wells	35.8	22	–	–	–	–
Agricultural wells	28.5	17	–	–	–	–
Springs	39.5	24	–	–	–	–
Subtotal – Internal resources	103.8	64%	41.6	40%	62.2	60%
Purchase from Mekorot	59.3	36%	59.3	–	–	–
Total availability	**163.1**	**100%**	**100.9**	**62%**	**62.2**	**38%**

Source: PWA 2014.
Note: M&I = municipal and industrial; -- = not available.

water purchases from Israel. The Oslo Accords[17] set the quantity of internal renewable water resources that the Palestinian Authority could develop and extract in West Bank. Through a combination of declining aquifer yield and rapid population growth, the availability of these water resources for each Palestinian in West Bank has fallen sharply from 1999 levels of 190 liters per capita per day to only 100 liters in 2013. Because somewhat more than half of these resources are allocated to agriculture, in 2013 only 40 liters per capita per day was available from internal resources for domestic municipal and industrial (M&I) uses. Given current average supply levels of 98 lcd, there is a structural deficit in supply for M&I from internal resources of more than 50 liters per capita per day. This deficit is increasing as the population grows and as the yield of groundwater aquifers continue to drop. In practice, the PA has been able to maintain supply quantities, but only by continually increasing dependence on water purchases from Israel. In 2013, two-fifths (41 percent) of bulk water for M&I was supplied from internal sources, and the remaining three-fifths (59 percent) was purchased from Israel's bulk water supplier, Mekorot (table 1.3).

Allocation and Distribution of Bulk Water are Not Currently Equitable or Efficient

The current network and its management do not achieve efficient and equitable transfer and distribution of bulk water. The bulk provider, the West Bank Water Department (WBWD),

manages wells and purchases water from Mekorot. It then distributes and sells bulk water to service providers. Given that Israel is providing much of the bulk supply, infrastructure for bulk water supply is fragmented and linked piecemeal with the Mekorot network. In addition, development of a bulk water network is severely constrained by limitations on infrastructure crossing Area C. Overall, the network and its management do not allow for efficient and equitable transfer and distribution. In addition, WBWD is still lagging in improving its technical and financial performance.

Bulk Water Resources in Gaza

The Aquifer that is Gaza's Only Freshwater Resource is No Longer a Source of Potable Water

Sustainable renewable resources in Gaza total about 90 liters per capita per day, but all of this is undrinkable and half is allocated to agriculture. Total water availability in the Gaza Strip in 2014 was 179 MCM. Of this, only one-third was sustainable groundwater yield and almost all the rest was overdraft.[18] Of the 179 MCM, about 93 MCM was allocated to municipal and industrial (M&I) uses in 2015, equivalent to 145 liters per capita per day. Of this, 90 liters could be counted as sustainable yield if the entire balance (about 86 MCM) allocated to agriculture were considered to be overdraft. However, *all* the water is so saline that it is undrinkable. Drinking water is largely supplied by private reverse osmosis plants, which provide more than 4 MCM to Gaza households, representing 97 percent of the water used for drinking and 67 percent of the water used for cooking (see box 1.1). Purchases from Mekorot are also on the rise. Purchases in 2016 were about 8 MCM, compared to the 3 MCM purchased in 2014, which represented only 3 percent of M&I resources (table 1.4).

Salinization has increased dramatically and most water in Gaza is no longer fit to drink. Gaza's only internal renewable water resource, the Coastal Aquifer, which until a few years ago provided abundant fresh water to the population, has suffered extreme unregulated overuse. Effectively, groundwater abstraction is out of control. Part of the problem is that the population has responded to water scarcity with a rapid expansion of private well drilling, which PWA has been unable to regulate. In 2014, abstractions of 170 MCM were almost three times the sustainable yield. Sewage contamination is also worsening groundwater quality. There has been a dramatic increase in salinization over the last decade, resulting from the over pumping of groundwater and consequent intrusion of seawater into the aquifer. Today the aquifer is so degraded and depleted that 97 percent of the groundwater in it is no longer considered potable.[19]

Table 1.4: Total Water Availability in Gaza, 2014, MCM

Source	Total volume	Agriculture	M&I
Pumped from wells	170.7	85.7	85.0
Desalinated water	4.7	0	4.7
Purchased from Mekorot	3.5	0	3.5
Total	**178.9**	**85.7**	**93.2**

Source: PWA 2014, tables 2 and 3.
Note: MCM = million cubic meters.

Notes

1. Movement and access restrictions refer to Israel's restrictions on movement and access of people and goods, both within West Bank and Gaza and through Israel to the rest of the world. See Chapter 8.
2. Chapter 8 provides a full discussion of the issues related to planning and investment.
3. This arrangement is stipulated in the Water Law, Section 35.
4. Section 6.6 in Chapter 6 discusses the cost to the PA of these effective subsidies and presents details about the subsidy and the consequent build-up of "net lending" arrears.
5. Taken together, these data cover services to about 80 percent of West Bank households, and all connected households in Gaza.
6. For more on movement and access restrictions, see Chapter 8.
7. PCBS 2017; PWA 2015c. There is no WSRC KPI to track continuity of service.
8. IBNET Blue Book 2014, table 1.14.
9. Affordability is calculated as average water revenues per capita/GNI per capita. Based on a 2014 gross national income (GNI) per capita for West Bank and Gaza of $3,060, Gaza's percentage is as follows: 92 lcd x 365 days x NIS 1.90/m^3 average price/3.83 x 1000 = $16.66 per year/$3,060 per capita GNI = 0.6 percent.
10. Non-revenue water is the difference between the water that is supplied and the water that is billed. It has three components: actual physical losses from the system; theft of water through illegal connections; and water supplied to customers who are not billed. Depending on the service provider's policy, this may include refugee camps, surviving family of martyrs, mosques, and public buildings.
11. For a further discussion of options, see Chapter 9.
12. Although this report specifically focuses on water service provision (see Introduction), the sanitation and wastewater sector is briefly described here to provide context.
13. Movement and access restrictions refer to Israel's restrictions on movement and access of people and goods (see box 8.2 in Chapter 8).
14. Issues related to resolving the bulk water constraint are discussed further in Chapter 7.
15. The difference is presumably water unaccounted for between the production point and the service provider distribution system: that is, losses at the bulk water level. Other estimates put availability lower. EWASH (2016), using data from the United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA), estimates that Palestinians in West Bank receive 73 lcd of potable water.
16. WSRC (2017), using the WSRC indicator "average daily water consumption at domestic level," calculated as domestic water sales divided by the served population.
17. For detailed discussion of the Oslo Accord allocation of water, see Chapter 7. For the political economy of Palestinian/Israeli arrangements and relations on water, see Chapter 9.
18. Overdraft of an aquifer occurs when abstractions exceed the recharge, leading to depletion of the groundwater reserves stored in the aquifer.
19. The aquifer also underlies part of Israel. PWA reports that "The existing Israeli wells surrounding Gaza from the north and northwest also have a negative impact by minimizing the lateral flow toward the Gaza Strip." [PWA communication commenting on a draft of this report, May 2017].

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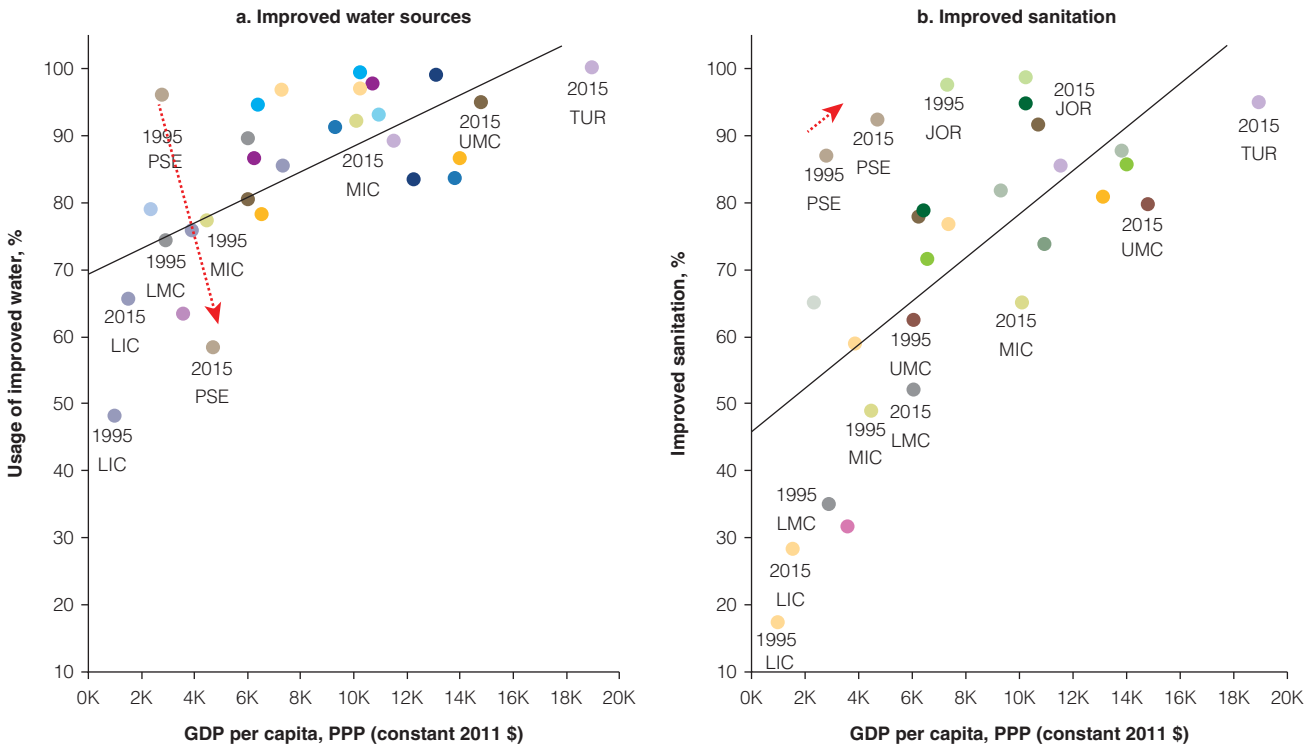
Chapter 2
The WASH-Poverty Context

Chapter 2 sets out the water supply, sanitation and hygiene (WASH)-poverty context for the Palestinian territories. It starts with the long-term trends in access to improved water supply and sanitation using estimates from the Joint Monitoring Programme for Water Supply and Sanitation (JMP). Section 2.2 digs deeper into poverty data for Gaza.

A Substantial Decline in Access to Improved Water Sources

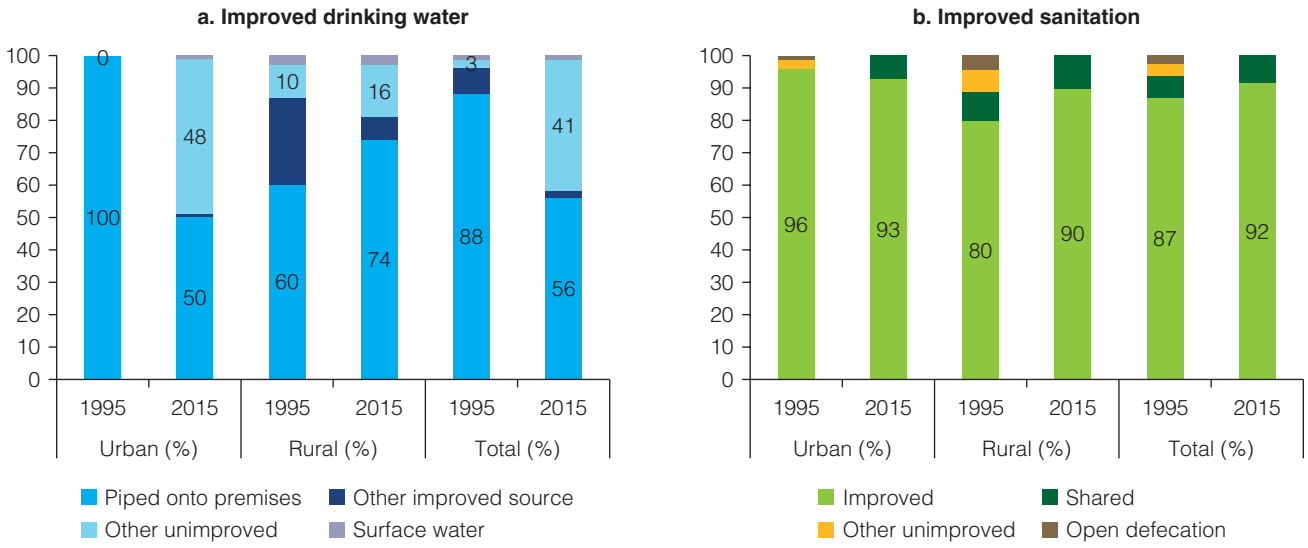
West Bank and Gaza faces a serious decline in access to improved drinking water sources, which started in 2000. In contrast, access to improved sanitation remains very high. The Joint Monitoring Programme has tracked WASH trends for more than two decades in the Palestinian territories. From close to universal access in 1995, which was sustained until 2000, access to improved drinking water sources declined to 58 percent in 2014. This 30 percent decline moved West Bank and Gaza from being a top performer globally in the mid-1990s to one of the worst performers by 2015 – below even the average for low-income countries (figure 2.1, Panel a). Over the same period, access to improved sanitation rose from already high levels to more than 90 percent – higher than the level of other lower-middle-income countries (figure 2.1, Panel b).

Figure 2.1: WASH Indicators and GDP per capita in 2011 PPP, West Bank and Gaza and Selected Peers



Source: World Development Indicators as of March 15, 2017.
Note: Oil-rich Gulf countries are not included in the scatterplots. HIC = high-income countries; JOR = Jordan; LIC = low-income countries; LMC = lower-middle-income countries; MIC = middle-income countries; PPP = purchasing power parity; PSE = Palestinian territories; TUR=Turkey; UMC = upper-middle-income countries.

Figure 2.2: Trends in Access to WASH Services by Urban or Rural Area of Residence in 1995 and 2015, West Bank and Gaza



Source: Joint Monitoring Programme (JMP).

The decline in access to improved water sources after 2000 seems to be fully driven by deterioration of piped water supply in urban areas, while improvements in sanitation occurred largely in rural areas. Figure 2.2, Panel a, shows that that the sharp deterioration in access to drinking water was primarily driven by declining urban water supply. This decline was confined to Gaza (which is largely urban), and was entirely due to the rapidly deteriorating quality of urban water supply there. In contrast, in rural areas, increased access to piped water replaced other improved water sources.[1] Figure 2.2, Panel b, demonstrates that the slight improvement in access to improved sanitation during 1995 and 2015 was predominantly rural.

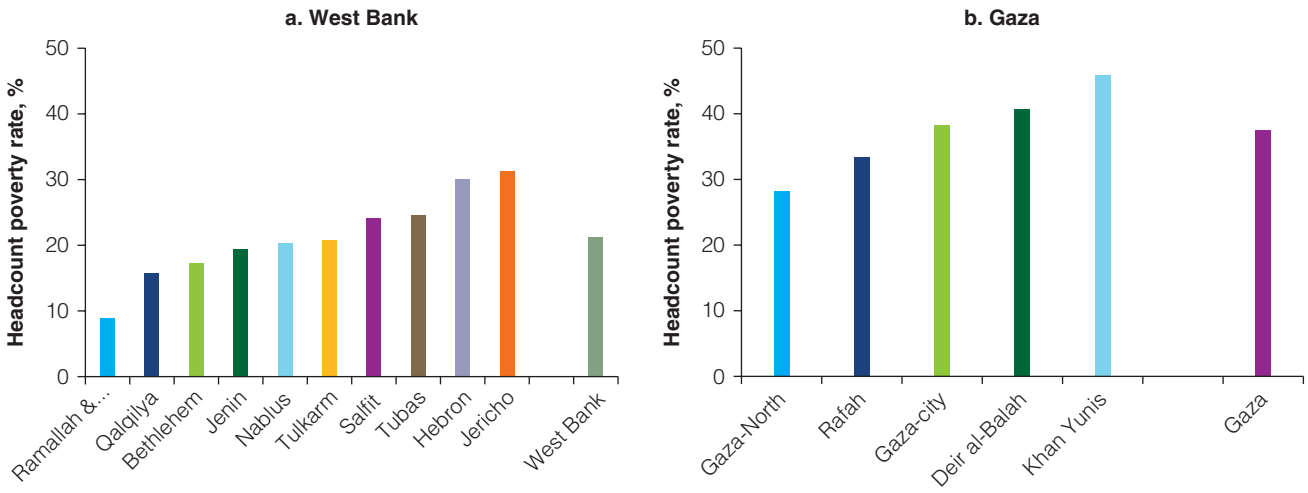
Much Greater Poverty in Gaza than West Bank

The lack of recent poverty data poses significant challenges in being able to identify the poor, and to profile their characteristics relative to the well-off. Until very recently, the last year for which poverty estimates were available for West Bank and Gaza was 2009. For the purposes of this Diagnostic, these estimates were updated until 2011, which is the latest year for which poverty data are available.[2] Using 2011 household survey data to identity where the poor and most vulnerable live will give an outdated and possibly incorrect picture. In many country contexts, household-level poverty and its determinants are likely to change over a five-year period; this is even more likely to be the case in contexts such as the Palestinian territories that are characterized by political uncertainty and conflict. Empirical evidence on the significant vulnerability of the poor during times of political uncertainty and conflict in West Bank and Gaza (World Bank 2011), combined with the continuing episodes of such conflict over the past five years, suggest that household budget survey estimates from the 2011 data may not be accurate today. In addition, poverty estimates from PECS are representative only at the regional level.

Therefore, to identify pockets of poverty where the poor live, this WASH-Poverty Diagnostic uses small area-level estimates of poverty based on the 2009 poverty map for West Bank and Gaza. In addition, PECS has traditionally collected very limited information on access to water supply, sanitation and hygiene services (WASH). Therefore, the chapter on measuring access to WASH services is based on other data sources, which are explained in Chapter 3.

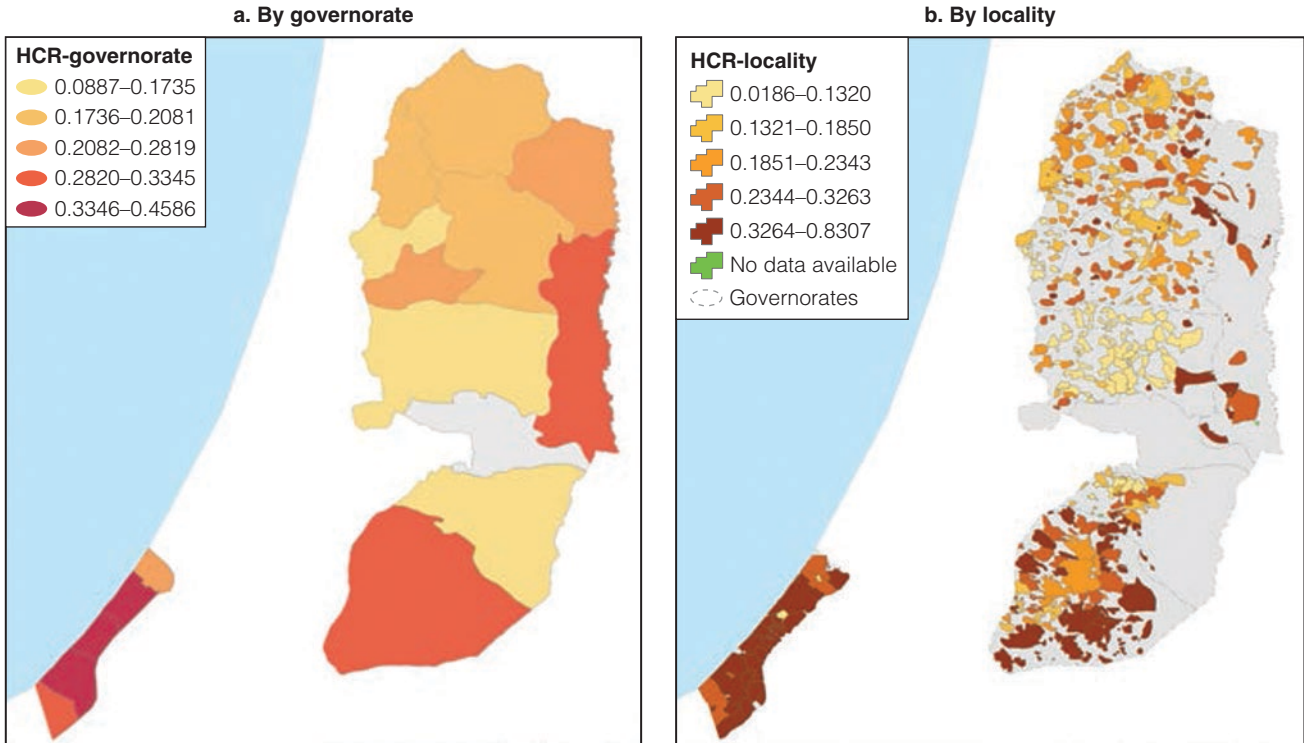
The highest poverty rates in the Palestinian territories are in Gaza. Figure 2.3 shows estimated governorate-level poverty rates in 2009. Even the poorest governorates in West Bank report lower headcount poverty than most governorates in Gaza. At the same time, poverty varies substantially within governorates, at the locality level – and this is true in West Bank as well (map 2.1). Pockets of poverty therefore also exist within more affluent governorates.

Figure 2.3: Poverty Map Estimates of Poverty at the Governorate Level, 2009



Source: Poverty rates are from Vishwanath et al. 2014.

Map 2.1: Estimated Poverty Headcount Rates, 2009 Poverty Map Estimates



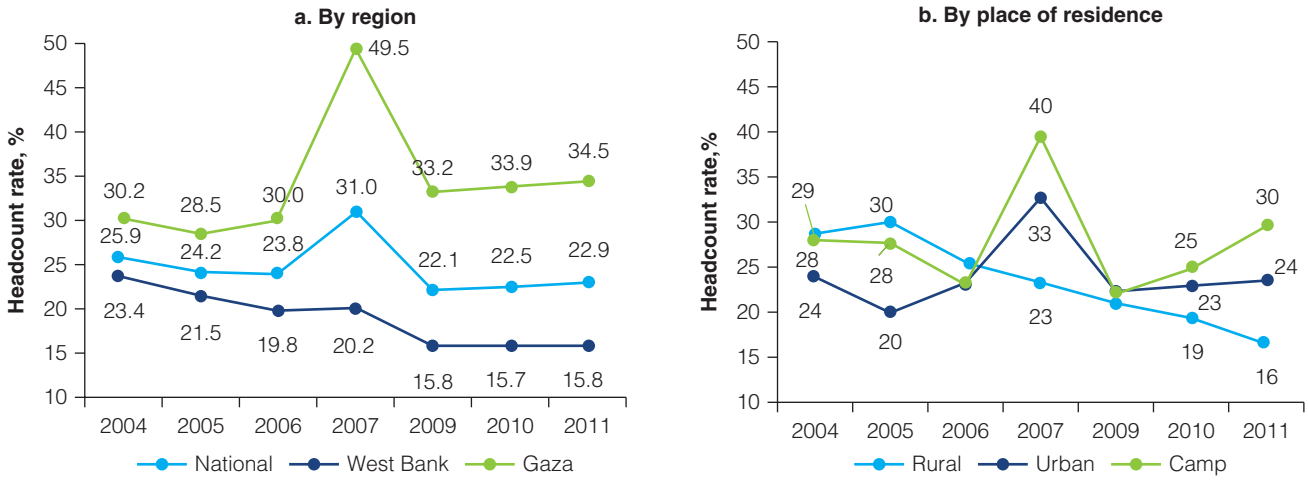
Source: Poverty rates are from Vishwanath et al. 2014.
Note: HCR = headcount rate.

Poverty is mostly an urban phenomenon. Poverty is high across all Gaza governorates; four out of the five governorates have an estimated poverty headcount rate well over 30 percent. In contrast, only two governorates in West Bank (Hebron and Jericho) have poverty rates close to 30 percent (figure 2.3, Panel a). Moreover, since Gaza is largely urban (with only 3 percent of population living in rural areas), the phenomenon of poverty in the Palestinian territories is also largely an urban one.

Employment status, the sector of employment, restrictions on movement and access, and education were important correlates of poverty from 2004 to 2009. Previous analytical work that covered the period 2004–09 identified employment and education as important correlates of a household's poverty status. This correlation was particularly strong in Gaza during periods of crisis. Unemployment rates are also highly correlated with spatial patterns of poverty across both regions, and over time (World Bank 2011; Vishwanath et al. 2014). Uniquely fragmented geography, characterized by the isolation of Gaza from the rest of the world, and barriers to movement and access within West Bank, play an important role in explaining spatial variations in socioeconomic outcomes (Vishwanath et al. 2014). Border closures and conflict, due to the deteriorating political and security situation, have curtailed access to power, fuel, and spare parts (World Bank 2009). As a result, water supply has become very intermittent and has fallen to crisis levels since 2005.

Continuing the examination of poverty trends to 2011 helps to both confirm and extend the spatial patterns observed in the 2009 poverty map. In particular, poverty is still concentrated in Gaza, and the gap in living standards between West Bank and Gaza has only increased over time (figure 2.4, Panel a). In 2004, the poverty headcount in Gaza was 29 percent higher than in West Bank. This gap expanded exponentially, reaching 145 percent in 2007. While it declined after 2009, it remained over 100 percent. In 2011, the headcount poverty rate in Gaza was close to 35 percent, which represented a slight increase from 2009. Between 2009 and 2011, poverty in West Bank remained unchanged, while poverty in the camps increased by 8 percentage points. In terms of absolute numbers, Gaza accounted for 57 percent of all poor in 2011, although it had only 38 percent of the total population.

Figure 2.4: Poverty Trends by Region and Place of Residence, West Bank and Gaza, 2004–11



Source: Authors calculations using MNAPOV database based on PECS 2004–2011.
Notes: Comparable poverty trends in Panel a are constructed using 1997 poverty line updated by inflation rates, following the methodology defined in World Bank (2011). Slight differences between poverty numbers for 2004–09 and numbers in World Bank (2011) are caused by slight changes in the definition of the welfare aggregate to make it consistent across years. MNAPOV = Harmonized collection of microdata in the Middle East and North Africa region; PECS = Palestinian Expenditure and Consumption Survey.

Notes

1. See Appendix E for definition of improved water source.
2. A new round of the poverty data collection under the Palestinian Expenditure and Consumption Survey (PECS) was completed in October 2017. Data were available only in March 2018, after this Report had been completed. Importantly, the newest poverty estimates confirm that Gaza is much poorer than West Bank and the situation has deteriorated compared to 2011.

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Chapter 3
Tracking Progress on Access, Quality of Water, and Sanitation Services, 2010–16

At the time that this Diagnostic was designed, the lack of recent poverty and WASH-relevant data posed a critical constraint to the measurement access of the poor to water supply, sanitation and hygiene (WASH) services. While the Palestinian Expenditure and Consumption Survey (PECS) 2011 had consumption data – which are used to measure official poverty rates – the survey could not be used for the core analysis. The data are outdated and the survey did not collect in-depth WASH data that could be used to measure Millennium Development Goal (MDG) and Sustainable Development Goal (SDG) indicators of access to these services.

Thus, this Diagnostic uses two other sources: new data on access to WASH services from a Local Government Performance Assessment (LGPA) Survey for West Bank and Gaza, which was implemented in 2016/17; and data from two rounds of the Multiple Indicator Cluster Survey (MICS), which were implemented in 2010 and 2014. The two MICS surveys collected data on WASH coverage and household wealth (assets) that are comparable over the two survey rounds. The WASH section of the LGPA survey, which was specifically designed for this Diagnostic, measures access-related MDG indicators covered by the MICS and covers indicators of quality (Access Plus) that can be used to track progress on the SDGs (see Appendix B). The LGPA data are also used to map multiple dimensions of access to WASH services at the lowest administrative level, the local government unit (LGU). Definitions of indicators are provided in Appendix E.

Measuring trends over time in access to WASH services using two different data sources (MICS and LGPA data) is not straightforward, even though they are both representative at the national and regional levels. First, the LGPA survey did not collect data from camps, while camps were covered by the MICS. Second, the regional population shares differ in the three datasets. This may affect comparability of national estimates across surveys. Therefore, the trends section of this chapter excludes camps from MICS data and does not report the trend of national estimates in the main text. However, all original estimates from MICS data are shown in Appendix C2. The results are qualitatively very similar.[1] A brief analysis of access to WASH indicators across urban, rural areas, and camps within West Bank and Gaza is provided in Appendix D.

The poor population is identified using household wealth, as measured by an asset index. The LGPA and MICS surveys collected data on a broadly similar list of assets, which can be used to construct a proxy indicator for household wealth (Appendix A describes construction of asset index for MICS data and Appendix C1 for LGPA data). While asset indexes have limitations, the PECS data were used to inform the design of a consistent asset index, which was then constructed using MICS and LGPA data. More details are presented in Section 3.1. Appendix B presents data on access to basic WASH services for the poor in three years covered by the PECS (2004, 2009, and 2011). In addition, the relationship between spatial poverty in 2009 and the most recent data on access to WASH services (over the 2010–16 period) was examined.

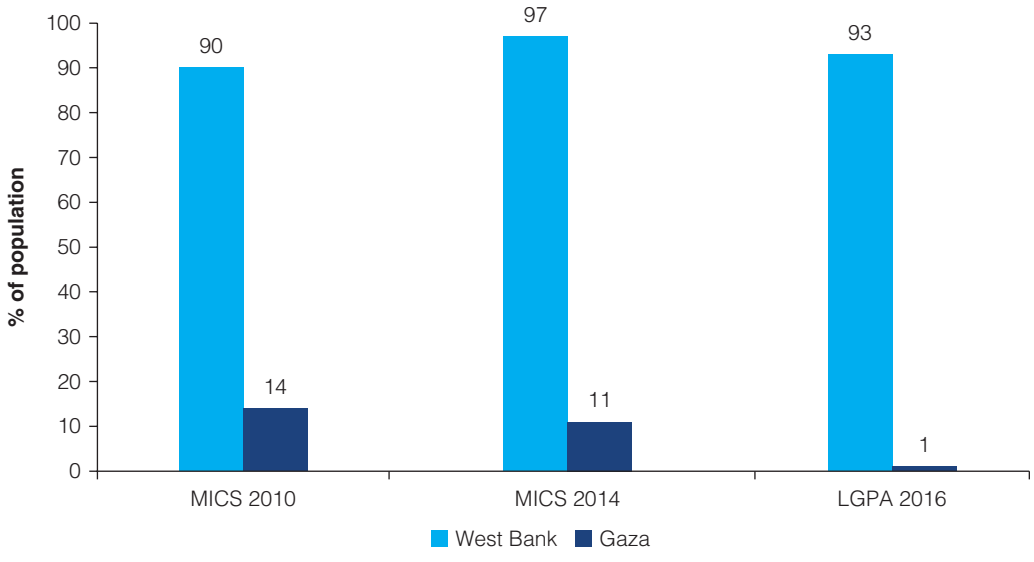
This chapter is organized as follows. Section 3.1 discusses trends in indicators of access to WASH. Section 3.2 adds the wealth dimension using estimated 2009 poverty numbers and newly constructed asset indexes. Section 3.3 adds quality dimensions by using LGPA 2016 data.

An Alarming and Worsening Drop in Access to Improved Water in Gaza

Access to improved drinking water services deteriorated sharply in Gaza. Figure 3.1 demonstrates the trend in access to improved water sources across regions using MICS 2010/2014 and LGPA 2016 data. Overall, the three datasets suggest an alarming and worsening situation in Gaza over the 2010–16 period. The decline was about 13 percentage points; by 2016, access to improved drinking water in Gaza was close to zero. Access in West Bank has remained high, but it varied over the period, and declined slightly in 2016 compared to 2014. Figure 3.2 plots the shares of the population with access to improved water sources across 224 LGUs in 2016. No single LGU in Gaza had access higher than 20 percent in 2016. Despite high overall access to improved water in West Bank, several pockets in this region have low access to improved water sources.

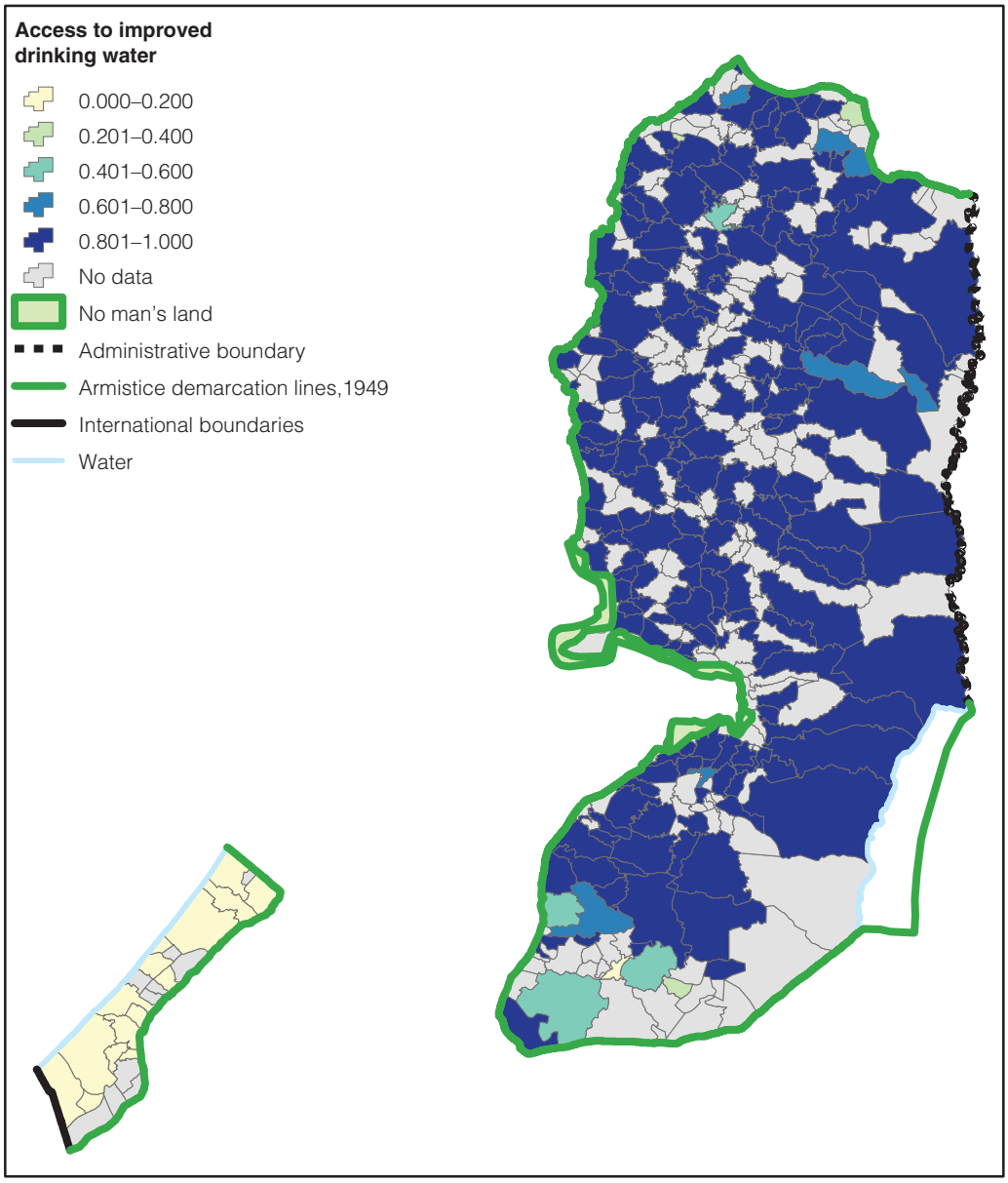
At the governorate level, access to water declined universally in Gaza, while in West Bank, access improved, reaching very high levels in all governorates except Jenin and Hebron. Substantial declines in access to water in Gaza during 2010–16 were observed in all five governorates (figure 3.3). Improvements in access in West Bank in 2010 and 2014 was driven by increased access in the underserved governorates of Jenin and Tubas, while the observed decline in 2016 is fully driven by Hebron. Pockets of low access to improved water remain in LGUs located in Jenin and Hebron governorates, 2016 data reveal.

Figure 3.1: Trends in Access to Improved Drinking Water Services by Regions, Excluding Camps, 2010, 2014, and 2016, % of population



Source: MICS 2010/2014 and LGPA 2016.
Note: Camps are excluded from MICS data. LGPA = Local Government Performance Assessment; MICS = Multiple Indicator Cluster Survey.

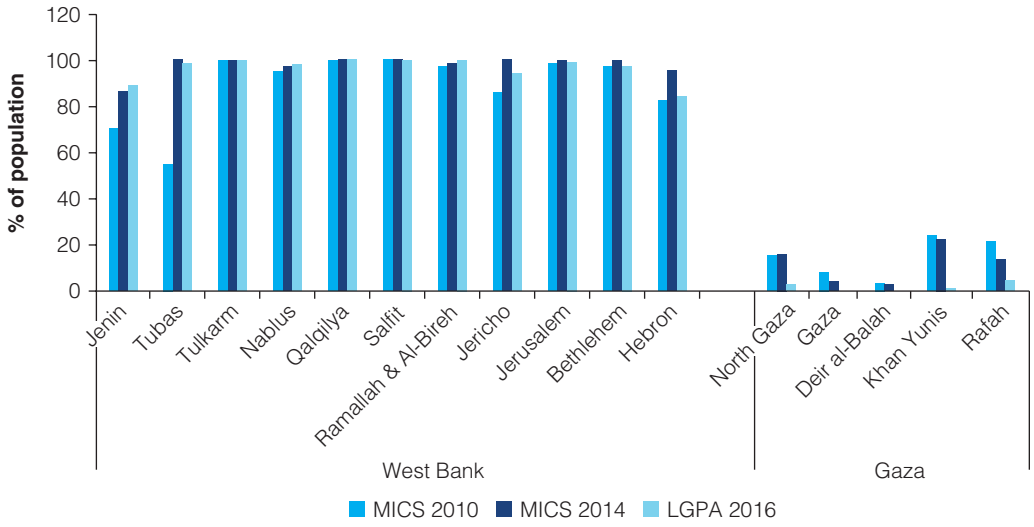
Figure 3.2: Access to Improved Drinking Water Source across LGUs, 2016, % of population



Source: LGPA 2016.

Access to improved and unshared sanitation services did not change substantially in 2016 compared to previous years, and access remained very high. Table 3.1 presents rates of access to improved unshared sanitation services based on MICS and LGPA data. Overall, no substantial changes in access occurred from 2010 to 2016. In West Bank, however, access declined slightly from 99 percent to 94 percent, mainly because of the decrease in Nablus, Salfit, and Jericho governorates. Levels of access to improved sanitation in 2016 by local government unit (LGU) are shown in figure 3.4. Access by LGU varies within the worst-performing governorates. For example, within Nablus, access to improved unshared sanitation varied substantially, from about 19 to 100 percent across LGUs.

Figure 3.3: Trends in Population Access to Improved Drinking Water Services by Governorates, Excluding Camps, 2010, 2014, and 2016, % of population



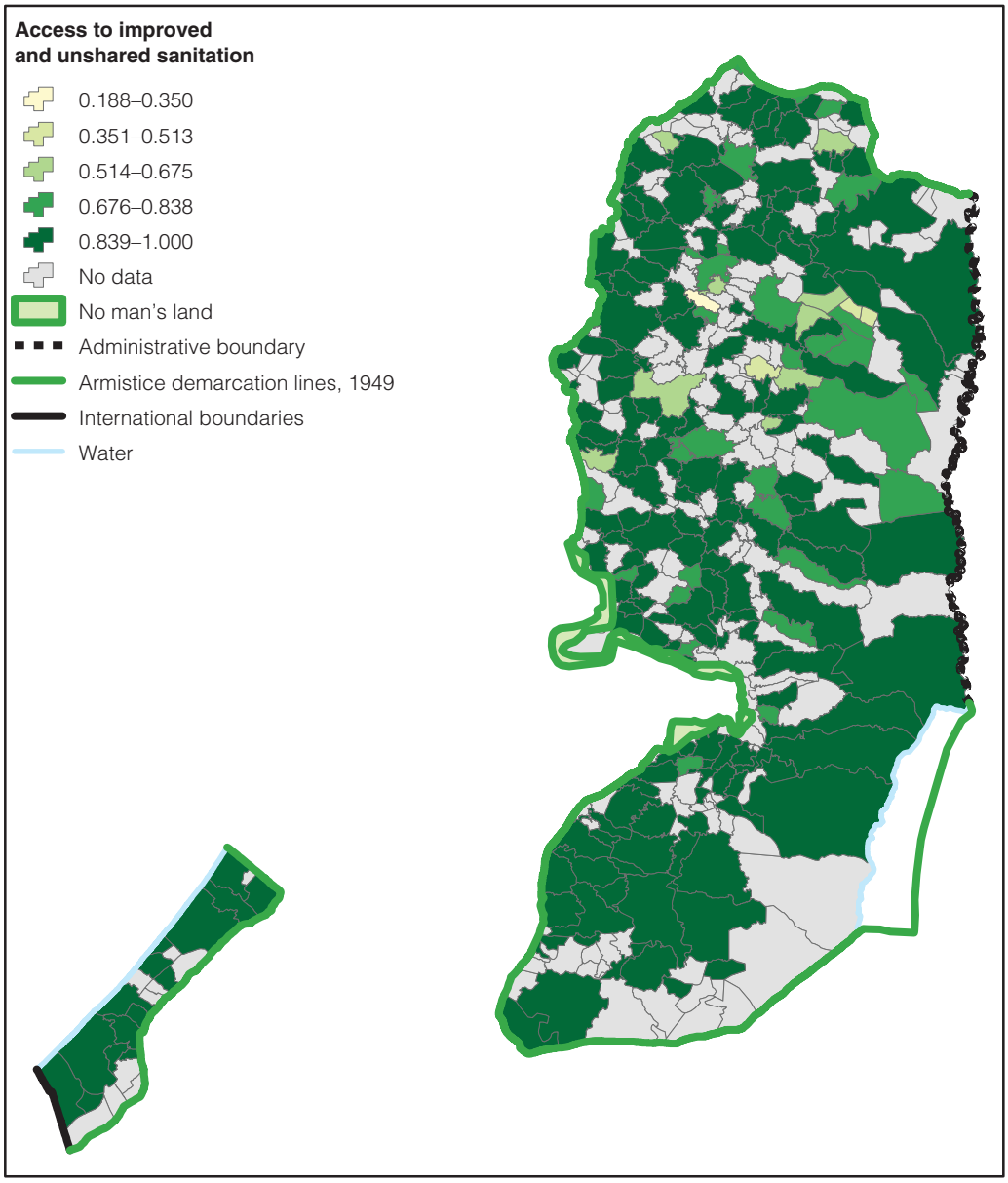
Source: MICS 2010/2014 and LGPA 2016.
Note: Camps are excluded from MICS data.

Table 3.1: Population Access to Improved Unshared Sanitation by Regions and Governorates, Excluding Camps, 2010, 2014, and 2016, % of population

	2010 (MICS)	2014 (MICS)	2016 (LGPA)
Regions			
West Bank	88	99	94
Gaza	95	98	99
Governorates			
West Bank			
Jenin	87	98	95
Tubas	77	100	98
Tulkarm	99	99	98
Nablus	98	100	85
Qalqilya	95	100	97
Salfit	67	98	89
Ramallah and Al-Bireh	80	99	94
Jericho	94	99	89
Jerusalem	89	98	91
Bethlehem	92	97	93
Hebron	85	99	98
Gaza			
North Gaza	92	97	99
Gaza	96	98	98
Deir al-Balah	99	100	99
Khan Yunis	95	99	99
Rafah	97	100	99

Source: MICS 2010/2014 and LGPA 2016.
Note: Camps are excluded from MICS data.

Figure 3.4: Access to Improved Unshared Sanitation across LGUs, 2016, % of population



Source: LGPA 2016.
Note: Improved unshared = share of population with access to improved unshared sanitation.

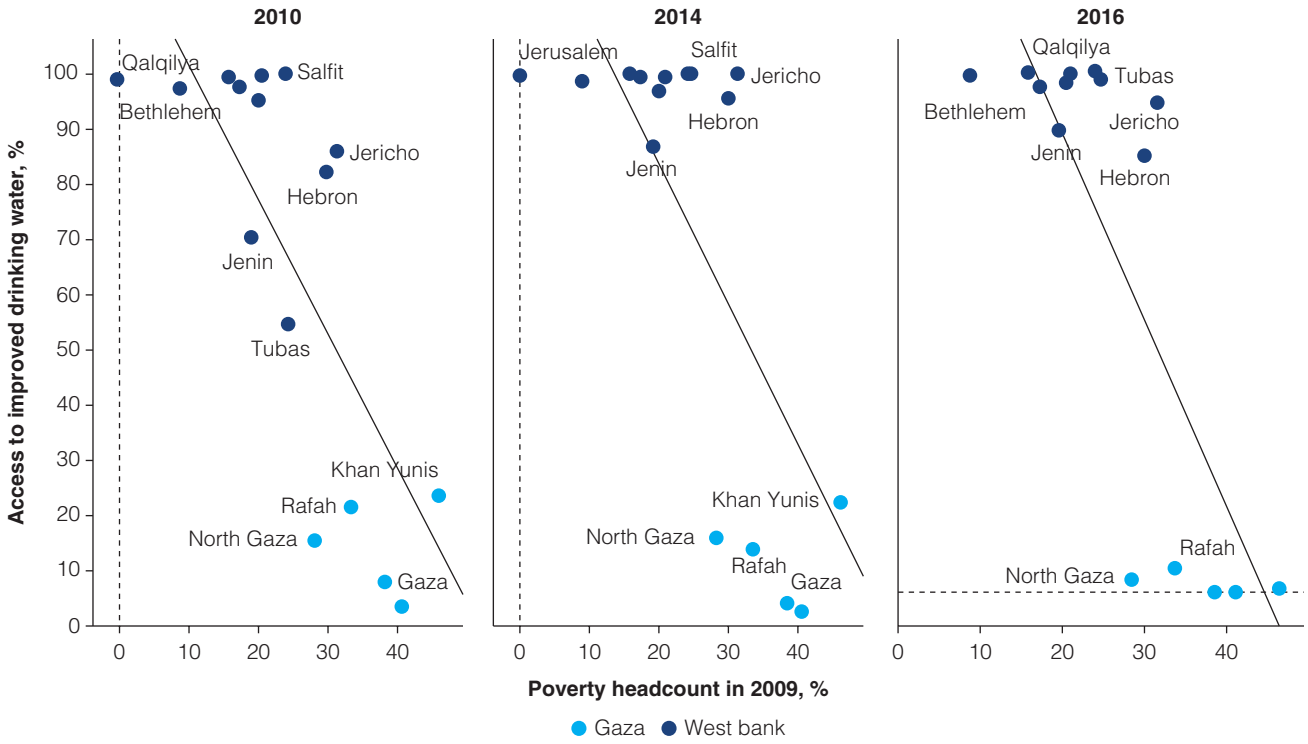
High Poverty Rates Worsen Gaza's Lack of Access to Improved Water

For the purposes of this Diagnostic, a wealth index was used to examine the access of the poor to WASH services over the 2010–16 period. For illustrative purposes, WASH indicators at the governorate level were compared with estimated 2009 poverty rates.[2] Using an asset index can provide a longer-run indication of living standards (Filmer and Pritchett 2001). While asset indexes have many limitations, and are not a substitute for consumption and

income data, they are increasingly used as a crude measure of the household's economic status in contexts where such data do not exist (Vyas and Kumaranayake 2006). The wealth index that is constructed by the MICS survey, and is typically used by MICS data users, is based on different sets of assets across rounds. It includes access to water supply and sanitation, which introduces a strong regional bias.[3] For this Diagnostic, an alternative wealth index was constructed at the national level using a similar set of assets across two rounds.[4] To the extent possible, a similar set of assets was also used to construct a national asset index using the LGPA data. While the constructed wealth indexes are not comparable, they are consistent in excluding any indicators related to water supply and sanitation. Different robustness tests are shown in Appendix A.[5]

The relationship between poverty and access to improved water sources at the governorate level is strong and negative – a pattern that is driven mainly by the stark regional differences between West Bank and Gaza.[6] One way of looking at the correlation between welfare and access to improved water is to plot estimated governorate poverty rates in 2009 (Vishwanath et al. 2014), and access to improved water from MICS 2010/2014 and LGPA 2016. In the scatter plot in figure 3.5, all governorates in Gaza are very poor and have very low access to improved water, and access declines over time. This trend identifies a strong negative relationship between spatial poverty in 2009 and access to improved water sources. However, if this relationship is explored within each region, it becomes much weaker. Using an asset index will help examine this relationship further at the household level.

Figure 3.5: Access to Improved Drinking Water in 2010, 2014, and 2016 versus Estimated Poverty Rates in 2009 by Governorates, Excluding Camps, % of population



Source: Poverty headcount rates are from Vishwanath et al. 2014.
Note: Camps are excluded from MICS data. Poverty data are as of 2009.

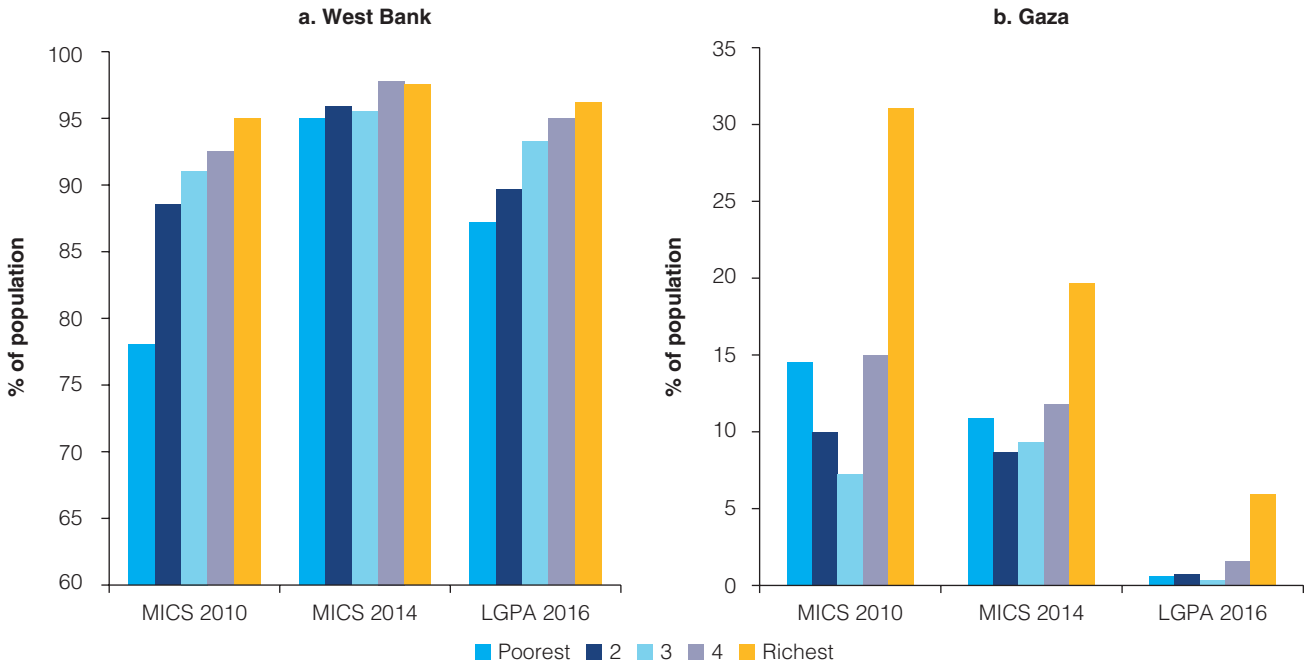
Access to improved drinking water increased to more than 80 percent in all West Bank governorates excluding camps between 2010 and 2016, with the biggest improvements in previously underserved poorer governorates. Figure 3.5 shows that by 2016, all West Bank governorates had access rates above 80 percent, with the largest improvements in three relatively poorer governorates: Jenin, Tubas, and Jericho. For example, access in Tubas increased from 55 percent to 99 percent and in Jenin from 70 percent to 89 percent.

However, access declined in 2014 and 2016, largely in Hebron. While in West Bank, access rates to improved drinking water at the governorate level increased in all governorates in West Bank, they declined thereafter, mainly in the poorest governorate, Hebron.

Despite the dominance of the regional effect, a slight inequality is still observed in access to improved water sources in both the West Bank and Gaza regions across asset index. Figure 3.6, Panel a, shows that access to improved water increased across the entire distribution in West Bank, with the asset-poor catching up as all quintiles moved to near universal access between 2010 and 2014. In 2016, however, the poorest population were still lagging wealthier populations in terms of access to improved water sources. Access to improved water sources in Gaza worsened for everyone, although asset-rich households still enjoyed slightly better access (figure 3.6, Panel b).

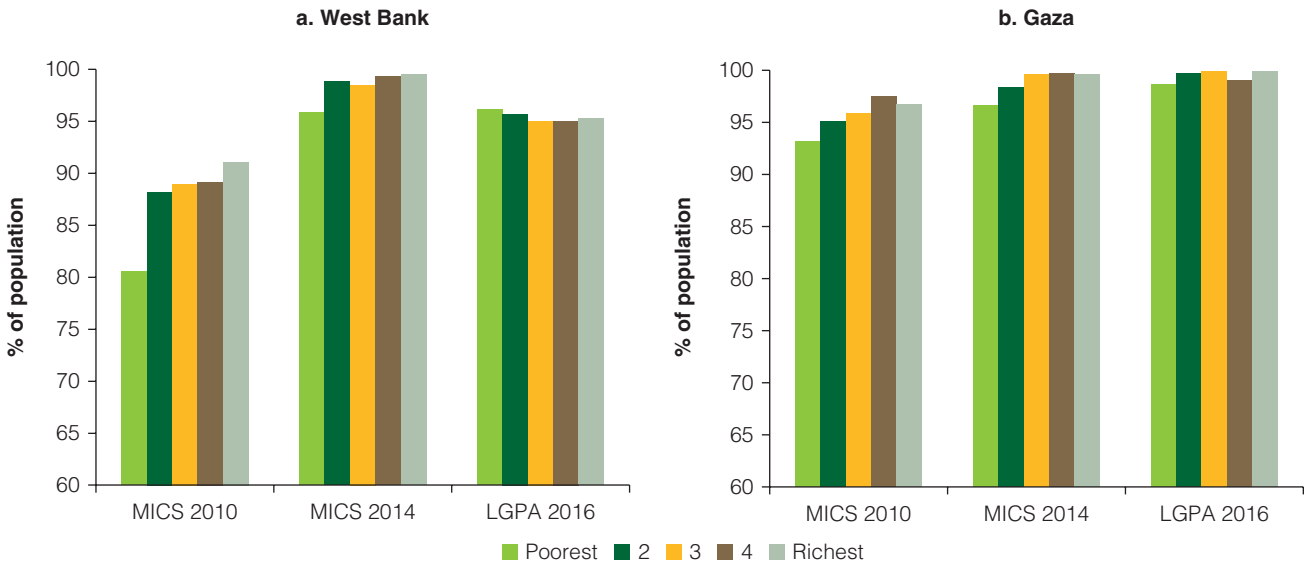
Access to unshared improved sanitation does not seem to be related to wealth, as measured by the asset index in 2016. While access to improved sanitation had a slight wealth gradient in the West Bank and Gaza regions in 2010, its coverage was more uniformly distributed in 2016 in both regions (figure 3.7). The next section discusses how different quality dimensions of WASH indicators are related to wealth, drawing on the 2016 LGPA data.

Figure 3.6: Trends in Access to Improved Sources of Drinking Water by Asset Index Quintiles across Regions, Excluding Camps, 2010, 2014, and 2016, % of population



Source: MICS 2010/2014 and LGPA 2016.
Note: Camps are excluded from MICS data.

Figure 3.7: Trends in Access to Improved Unshared Sanitation by Asset Index Quintiles across Regions, Excluding Camps, 2010, 2014, and 2016, % of population



Source: MICS 2010/2014 and LGPA 2016.
Note: Camps are excluded from MICS data.

The More Comprehensive SDG Targets Reveal Further Gaps in WASH Services

The analysis in this section allows for new insights on the Sustainable Development Goal (SDG) dimensions of WASH indicators of safely managed drinking water and sanitation as of 2016. The discussion is based mainly on the analysis of the recently collected Local Government Performance Assessment (LGPA) Survey. The survey collected several indicators – beyond those used in MICS – on the quality, access, reliability, and affordability of WASH services.

High Connection to Piped Water does not Guarantee Timely Access and Good Quality of Drinking Water

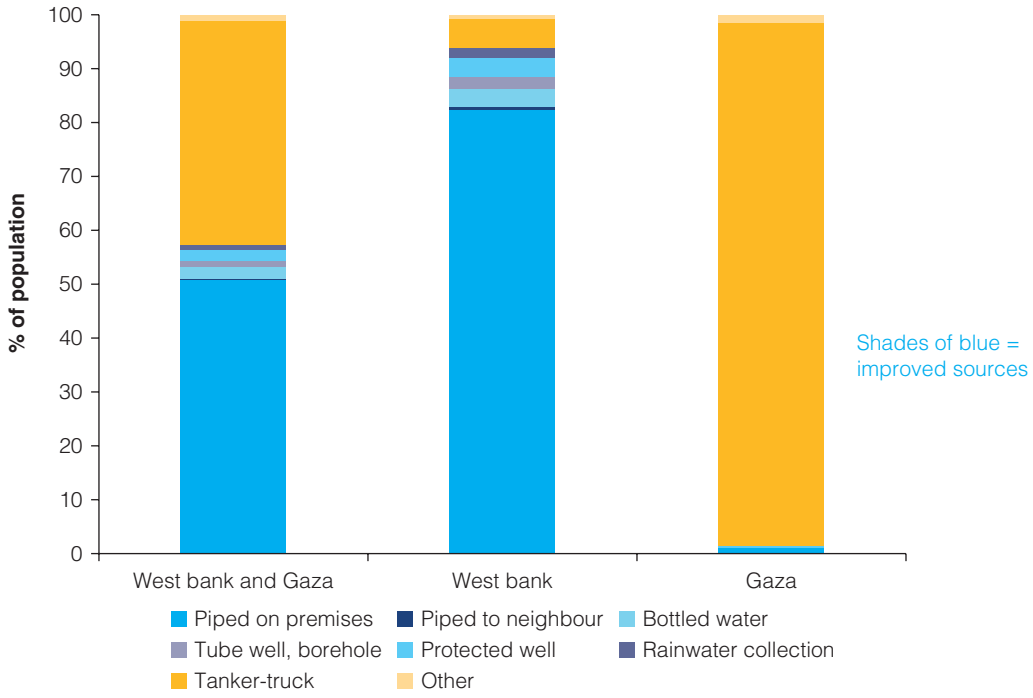
Access to improved drinking water was close to universal in West Bank and very low in Gaza: 93 versus 1 percent. Overall, about 57 percent of population in the Palestinian territories had access to improved drinking water sources in 2016. Figure 3.8 shows the main source of drinking water in West Bank and Gaza. All improved sources are in blue.

Traditionally, the main unimproved source has been the tanker-truck, which plays a crucial role in Gaza. More than 97 percent of the population in Gaza report using this as the main source of drinking water. Tankers play a marginal role in West Bank, where they are used as a main source of drinking water by only 6 percent of the population.

The availability of drinking water poses a greater problem than the distance to water sources. The SDGs go beyond the MDG definition of access by adding dimensions of distance and availability. These are key criteria in the SDG definition of "safely managed" water Three additional main indicators can be examined based on the LGPA data:

- Improved water within 30 minutes' roundtrip from the household. This level is considered access to at least a "basic" level of drinking water, according to international monitoring in the SDG timeframe.

Figure 3.8: Main Source of Drinking Water in the Palestinian Territories, 2016, % of population



Source: LGPA 2016.
Note: Although one of the original response categories was best translated as "public tap/standpipe," the majority of households that chose this category report that the public tap is located in their own dwelling or own yard, and hence this can be better understood as "piped on premises." This interpretation is supported by the MICS data, where no respondents reported connections to drinking water via public taps and standpipes.

- Improved water on premises. To meet the SDG standard of "safely managed," the improved water source must be on premises. The benchmark is 95 percent of the population.

- Improved water on premises and available when needed. This indicator incorporates the dimension of availability. Drinking water is defined as unavailable if the source is not available for at least one full day during the previous two weeks. Having a sufficient quantity of drinking water is another way of looking at the quality of water supply.

These three dimensions are explored in table 3.2.

All West Bank governorates except three meet the SDG benchmark of having 95 percent access to improved water on premises. Access on premises is below the benchmark in only Jericho (94 percent), Jenin (87 percent), and Hebron (83 percent). It is almost universally the case that the water source is not located far from the household: well within 30 minutes' roundtrip from the household. Thus, the estimate made by this study for the SDG indicator is not very different from the estimates found for MDG access. The estimate for on-premises services is also very close to the estimate based on the MDG indicator because in most cases the source is on premises, including when the household reports that they rely on public taps and standpipes.

However, on average, only 80 percent of people have access on premises when needed. In only one governorate (Tulkarm) do 95 percent of people have access when needed, while access in three governorates is below 80 percent: Hebron (75 percent), Jenin (74 percent), and Nablus (69 percent). Overall, the share of population with access to improved water drops from

Table 3.2: Adding Dimensions of Distance and Availability to Measures of Access to Drinking Water, by Region and Governate, 2016, %

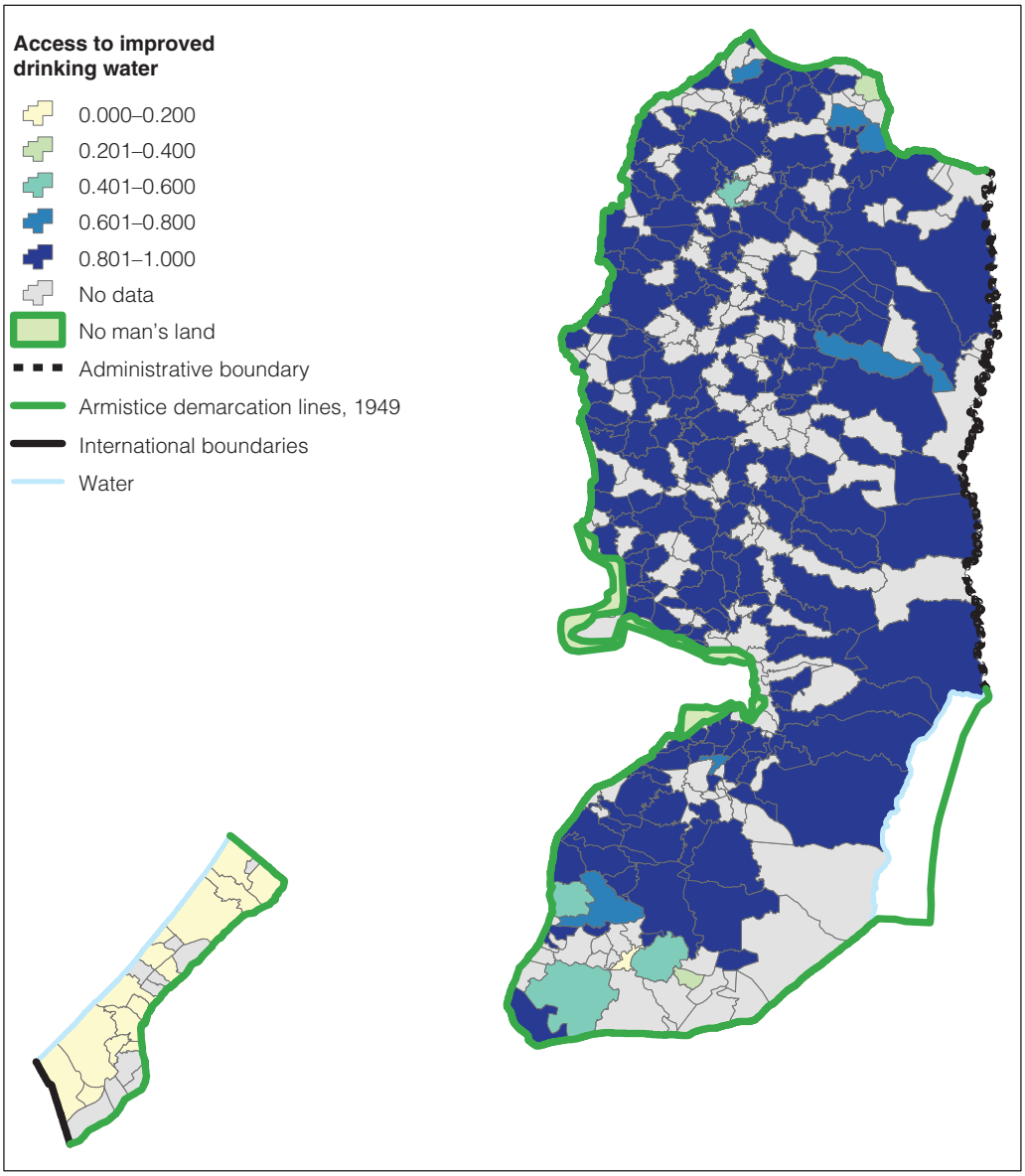
	MDG, improved water	Improved water within 30 minutes' roundtrip from household	Improved water on premises	Improved on premises + available when needed
Total	57	57	57	49
Region				
West Bank	93	93	92	80
Gaza	1	1	1	1
Governorates				
West Bank				
Jenin	89	89	87	74
Tubas	99	99	97	87
Tulkarm	100	100	99	95
Nablus	98	98	97	69
Qalqilya	100	100	96	87
Salfit	100	100	100	88
Ramallah and Al-Bireh	99	99	98	82
Jericho	94	94	94	79
Jerusalem	99	99	98	94
Bethlehem	97	97	95	80
Hebron	84	84	83	75
Gaza				
North Gaza	3	3	3	2
Gaza	0	0	0	0
Deir al-Balah	0	0	0	0
Khan Yunis	1	1	1	1
Rafah	4	4	4	3

Source: LGPA 2016.

57 percent using the simple MDG standard of access to 49 percent once the higher SDG standard of availability is taken into account. All governorates in West Bank are worse off once these discontinuities of drinking water supply are considered (table 3.2).

At the LGU level, access may be considerably less. In many LGUs in West Bank, access on premises when needed is well below the 81 percent average, and for some of them the level is less than 50 percent. Figures 3.9 and 3.10 contain two maps at the LGU level showing the percent of population with access to improved water and improved water on premises and available when needed. Variation in access to water is greater at the LGU level than the governorate level. Figure 3.11 combines the two indicators into one scatterplot. In many LGUs in West Bank, the share of the population having access to improved water ranges from 50 to 100 percent – but it drops below 50 percent once availability is taken into account (see the red circle in the upper-left-hand quadrant). These LGUs are particularly affected by intermittent and unreliable access to drinking water.

Figure 3.9: Access to Improved Water by LGUs in 2016, % of population

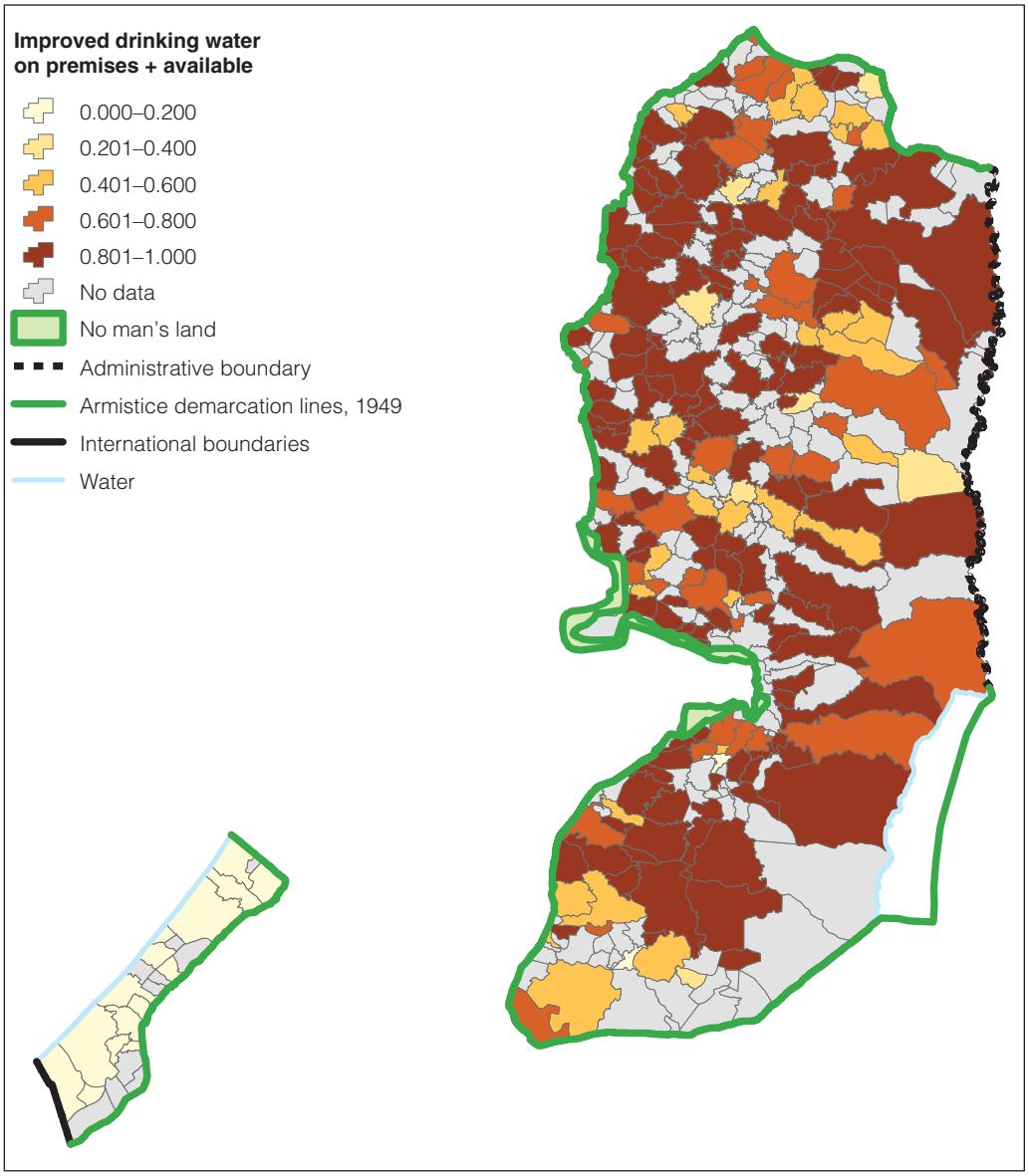


Source: LGPA 2016.

The source of drinking water and region affects the reliability of supply, with tankers being more reliable in Gaza and piped water more reliable in West Bank. Figure 3.12 shows the percent of population for whom drinking water was unavailable at least one full day during the previous two weeks. Clearly, neither piped water nor tanker-track sources guarantee continuity in supply. However, striking difference exists across regions. In West Bank, piped water is most reliable source, while in Gaza, tanker-trucks and other sources are more reliable than piped water.

A significant share of the population (about 18 percent) indicated that they did not have a sufficient quantity of drinking water at least once in the preceding month. This share is higher in Gaza (23 percent) than in West Bank (16 percent). Nablus, Gaza, Deir Al-Balah, and North Gaza governorates seem to be particularly affected. As one would expect, the population that uses improved sources of drinking water is less likely to experience shortages compared to those using unimproved sources: 14 versus 24 percent, respectively.

Figure 3.10: Access to Improved Water on Premises and Available as Needed by LGUs in 2016, % of population

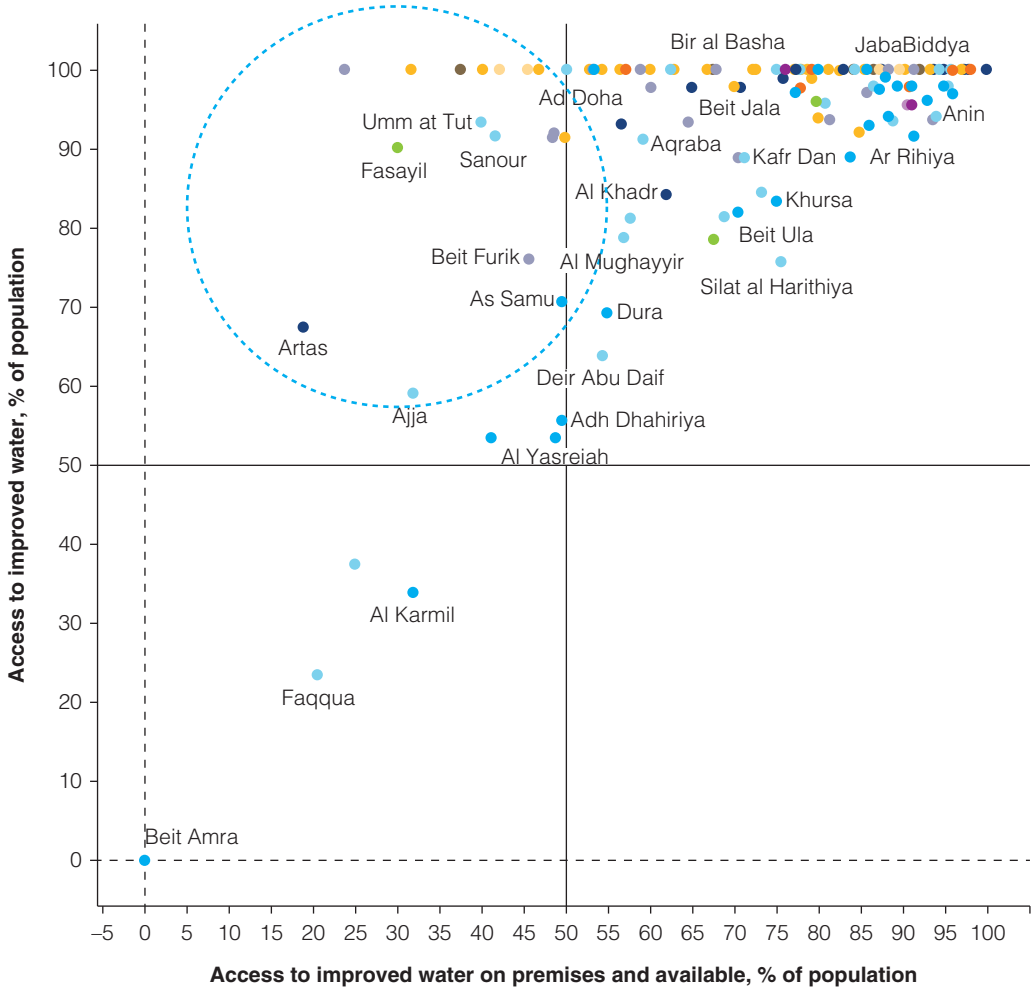


Source: LGPA 2016.

To cope with intermittent access to water, a household water storage tank is an almost universal strategy. No matter what their main source of water is, everyone is likely to report they have a water storage tank, according to the LGPA data. Thus, 97 percent of the population in Gaza and 92 percent of the population in West Bank reported having a water storage tank on the roof or in the courtyard.

Connection to public networks is high in both West Bank and Gaza, but differences in the quality of water supply services are huge. Overall, about 92 percent of the population report connection to piped water. This percentage is higher in West Bank than in Gaza: 95 versus 88 percent, respectively. Given the very high rate of connection to the network in Gaza and the fact that network water costs little or nothing, poor people can readily access network water. Yet mere

Figure 3.11: Access and Availability of Drinking Water by LGUs in West Bank, 2016, % of population



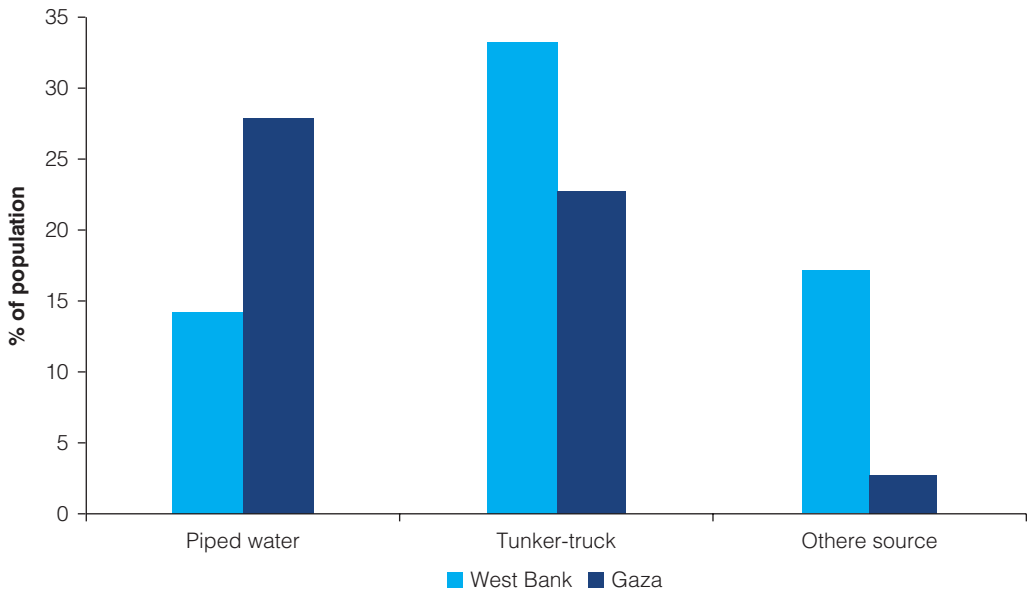
Source: LGPA 2016.

access – available to poor and rich alike – does not ensure access to improved water. Hence, the likely explanation of differential access to improved water between the two regions lies in differences in water quality.

Quality of piped water is very important problem in Gaza. Among those who report having connections to piped water, about 37 percent did not report any problems with the quality of water services. This share is much lower in West Bank. For example, in West Bank, 48 percent did not report any problem with the quality of water supply compared to only 20 percent in Gaza. In West Bank, the main problems reported were: discontinuity of supply (12–19 percent of total respondents connected to piped water); low water pressure (30 percent); and cost (9 percent). Water quality (color, smell, taste) was a problem for fewer than 7 percent of West Bank respondents. In Gaza, in contrast, the overwhelming problem was water quality, with 60 percent of respondents citing problems with color, smell, or taste (figure 3.13).

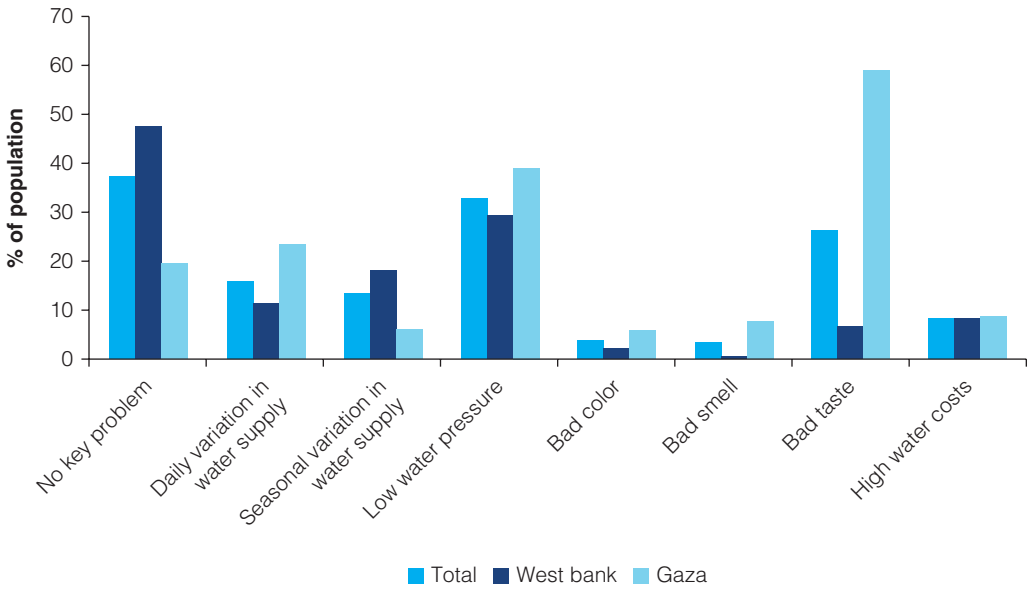
Years of overexploitation and sewage infiltration into the aquifer have resulted in pollution of 95 percent of groundwater resources in Gaza, with high proportions of nitrates and chlorides, well above international guidelines for potable water resources.[7] The major parts of the aquifer have

Figure 3.12: Population without Access to Drinking Water at Least One Full Day during the Previous Two Weeks, 2016, % of population



Source: LGPA 2016.

Figure 3.13: Key Reported Problems among Population with Piped Water in 2016, % of population



Source: LGPA 2016.
Note: Means are constructed only for those respondents who report connection to a public pipe. Households were allowed to report up to three problems.

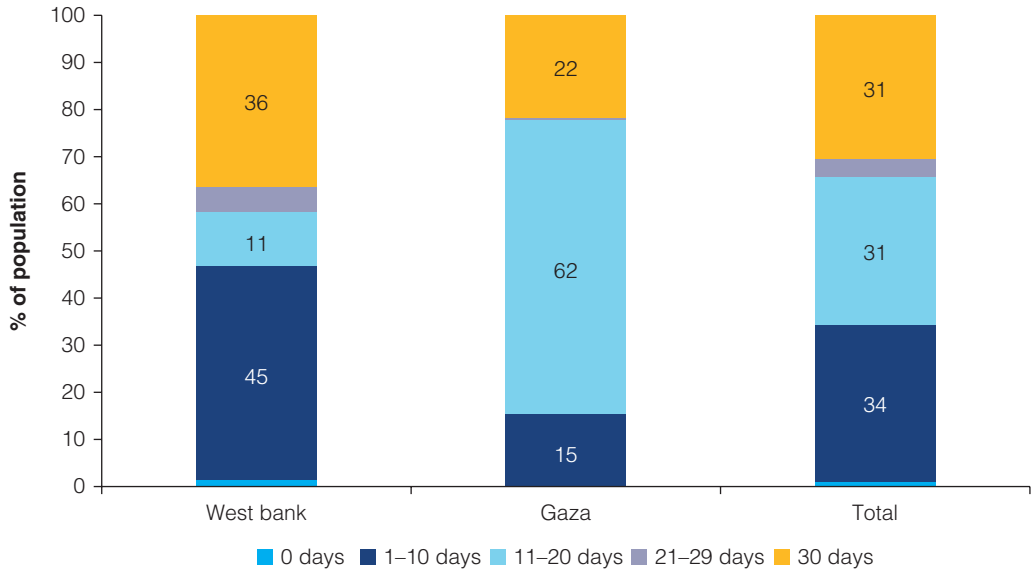
chloride concentration of 500–1500 mg/l, while along the coastline the concentration of chloride exceeds 2000 mg/l. Most of the 260 municipal wells have salt and nitrate levels above standards set by the World Health Organization (WHO) and their water is unfit for human consumption.[8] Groundwater quality is generally acceptable in West Bank, with localized concentrations of chlorides and nitrates.[9]

Access to piped water is intermittent for two-thirds of the population, with 47 percent of the population in West Bank and 15 percent in Gaza having access for fewer than 10 days a month. The LGPA data include a measure of the number of days for which piped water was available during the previous month. Only one-third of total population report having had supply for 30 days in the previous month (figure 3.14). In Gaza, the majority reported piped water supply for fewer than 20 days per month. This lack of access to a daily water supply is very common, and seems to be widely accepted. For example, among the respondents who did not report any issue with piped water, only 57 percent receive piped water for 30 days per month.

The perceptions of problems with piped water seem to be less frequent for water supplied by the Joint Service Council (JSCs), although JCSs supply only about 2 percent of the population. Municipal and Village Councils are the key source of piped water supply, with 87 percent of the population receiving piped water from this source in 2016 (figure 3.15). Water utilities are in second place, supplying piped water to 10 percent of the population. Households that are served by JSCs are less likely to report problems with the quality compared to households that receive water from other sources (figure 3.16).[10] Consistent with this finding, water from JSCs is less prone to interruptions. For example, water from JSCs was available for 30 days per month for 59 percent of the population, compared to 30 percent of the population served by municipal/village councils.

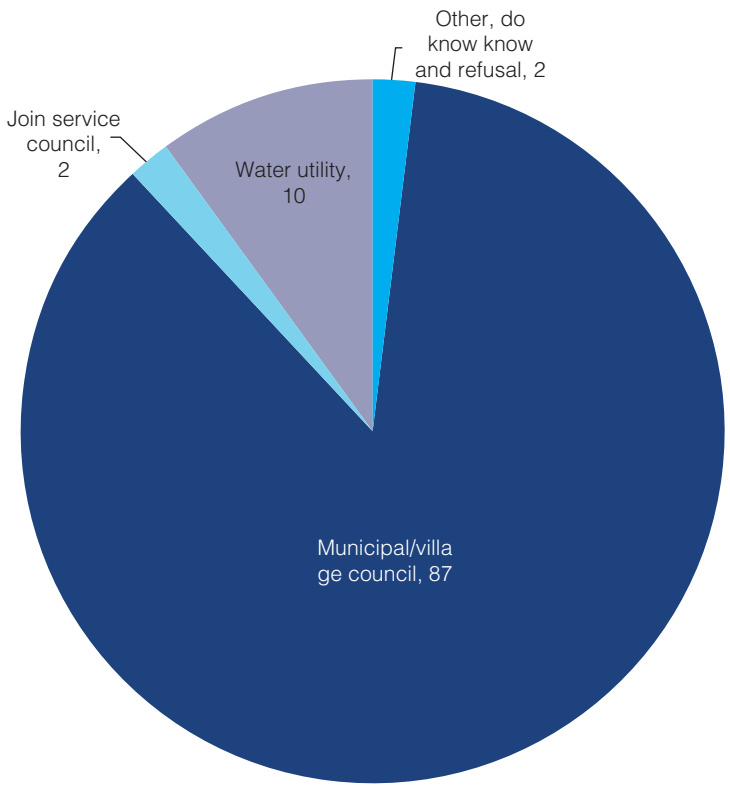
Water from unimproved sources is not treated, posing health risks. Households must store water for later use because access is intermittent. The methods used for storage could undermine water safety. Appropriate household treatment could help make water safe for drinking. However, only about 7 percent of population in the Palestinian territories use any treatment or filter drinking water. This share is higher among those who use improved water sources: 11 versus 2 percent, respectively.

Figure 3.14: Days per Month of Piped Water Supply by Regions, 2016, % of population



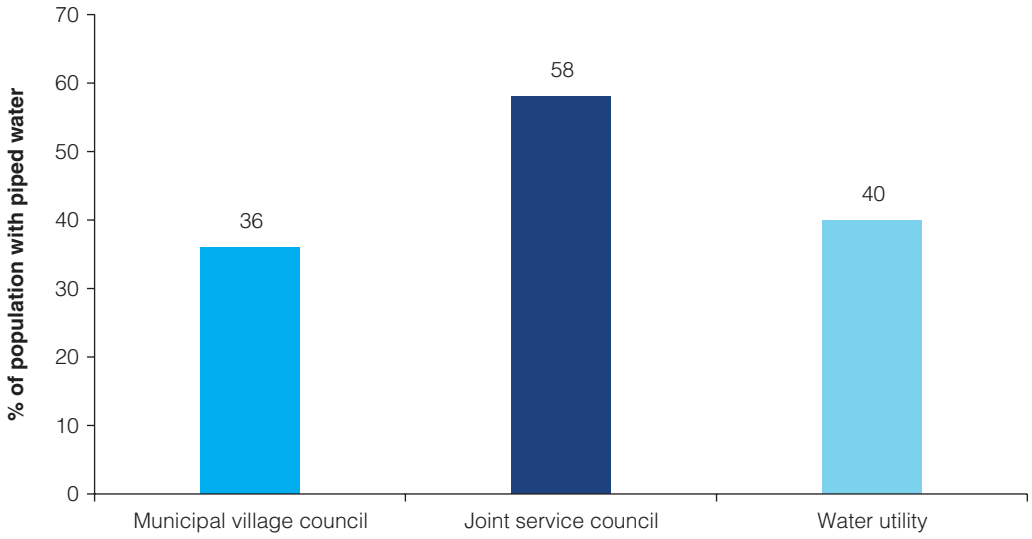
Source: LGPA 2016.

Figure 3.15: Suppliers of Piped Water, 2016, % of population



Source: LGPA 2016.

Figure 3.16: Share of Population without Key Problems with Piped Water, by supplier, 2016, % of population



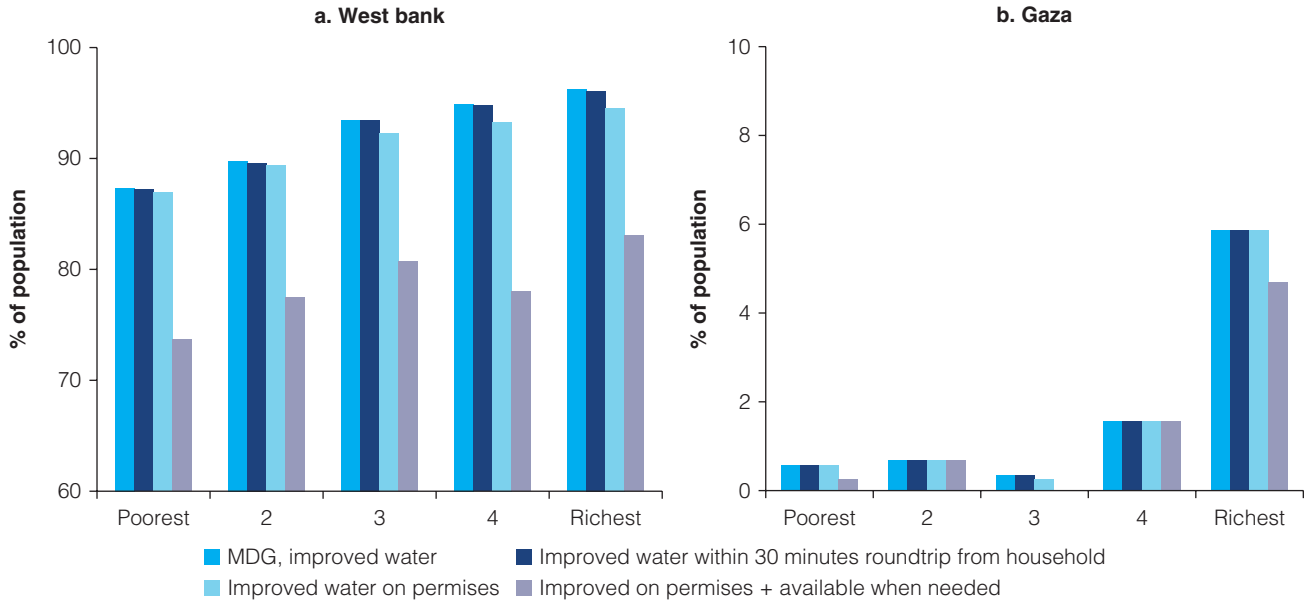
Source: LGPA 2016.

The income inequality seems to be less important in determining access to improved water sources than the area of residence. However, wealth still affects access because of the close correlation between some water sources and the asset index. Figure 3.17 plots access to different improved drinking water indicators using asset index quintiles. The relationship between wealth and access to improved water is slightly positive across all indicators in West Bank (Panel a). In Gaza, access is very low (Panel b). Less than 2 percent of the population receive improved water, on average. Access is also low for the richest quintile, but it is slightly higher than the population from less affluent quintiles.

An examination of different sources of drinking water helps explain why wealth is not a very strong predictor of access to improved water sources. The most prevalent sources of drinking water do not vary much with income, as measured by the national asset index, in either West Bank or Gaza (table 3.3). In West Bank, piped water is the main source regardless of welfare status, while in Gaza the main source is tanker-truck. Still, some sources of water are clearly correlated with wealth. Thus, in West Bank, only the richest population uses bottled water as a main source, while tanker-trucks are mostly used by the poorest. In Gaza, the richest population use piped water more often and rely less on tankers than less wealthy people do.

Another indication that wealth is not a strong predictor comes from a multivariate regression. Inequality in access may be driven by combination of location and wealth effects. Multivariate regression allows them to be separated. Once the analysis controlled for the effect of place of residence (LGUs), for West Bank, a statistically significant difference in the probability of access to improved water on premises and available when needed remains only between the poorest and wealthiest quintiles. The probability of having access to improved water on premises and available when needed increases from 73 percent in the poorest quintile to 81 percent in the richest quintile in West Bank.[11]

Figure 3.17: Access to Different Improved Water Indicators by Asset Index Quintiles across Regions, 2016, % of population



Source: LGPA 2016.

Table 3.3: Main Source of Drinking Water by Asset Index Quintiles, 2016, % of population per quintile

	Poorest	2	3	4	Richest
West Bank					
Piped	77.5	80.6	85.9	83.5	82.6
Bottled water	0.7	0.5	1.9	4.1	6.9
Tube well, borehole	2.0	2.2	1.3	1.8	2.2
Protected well	4.6	4.5	3.0	3.4	3.0
Rainwater collection	2.5	1.9	1.5	2.0	1.6
Tanker-truck	11.4	8.8	5.7	4.5	3.3
Other	1.4	1.6	0.9	0.6	0.4
Gaza					
Piped	0.4	0.7	0.3	1.1	4.6
Bottled water	0.1	0.0	0.0	0.0	0.0
Tube well, borehole	0.0	0.0	0.1	0.0	0.0
Protected well	0.1	0.0	0.0	0.5	1.2
Rainwater collection	0.0	0.0	0.0	0.0	0.0
Tanker-truck	97.4	98.3	98.6	97.7	91.5
Other	2.1	1.0	1.0	0.7	2.7

Source: LGPA 2016.

Access to Improved Sanitation is High, but So Is the Risk of Sewage Overflow – Especially for the Poor in Gaza

While on average, 96 percent of the population have access to improved unshared sanitation (94 percent in West Bank and 99 percent in Gaza), and only 4 percent share improved sanitation facilities, only 48 percent are connected to sewage facilities (30 percent in West Bank and 78 percent in Gaza). Rates of sewage connection vary widely in the West Bank, from zero (in Tubas) to 57 percent (in Qalqilya). Table 3.4 presents data on access to different types of sanitation. Universally, the population in the Palestinian territories does not practice open defecation. Furthermore, they have access to a type of facility that would be deemed "improved" if consideration did not have to be taken for whether it is shared with another household or private to the household. However, when shared improved sanitation facilities are excluded from the data on improved sanitation (using the definition of "improved" in the MDGs), the access in several governorates, particularly Nablus, Jerusalem, and Jericho, falls below universal. Using flush to sewage connections is widespread in Gaza, but is used by only 30 percent of population in West Bank.

Poorer populations have lower access to improved sanitation (flush to sewage). Figure 3.18 shows usage of flush to sewage connections in 2016 across wealth quintiles based on the asset index. The inequality in access associated with asset index is particularly pronounced in West Bank, where only 13 percent in the poorest quintile use flush to sewage, compared to 42 percent in the richest quintile.

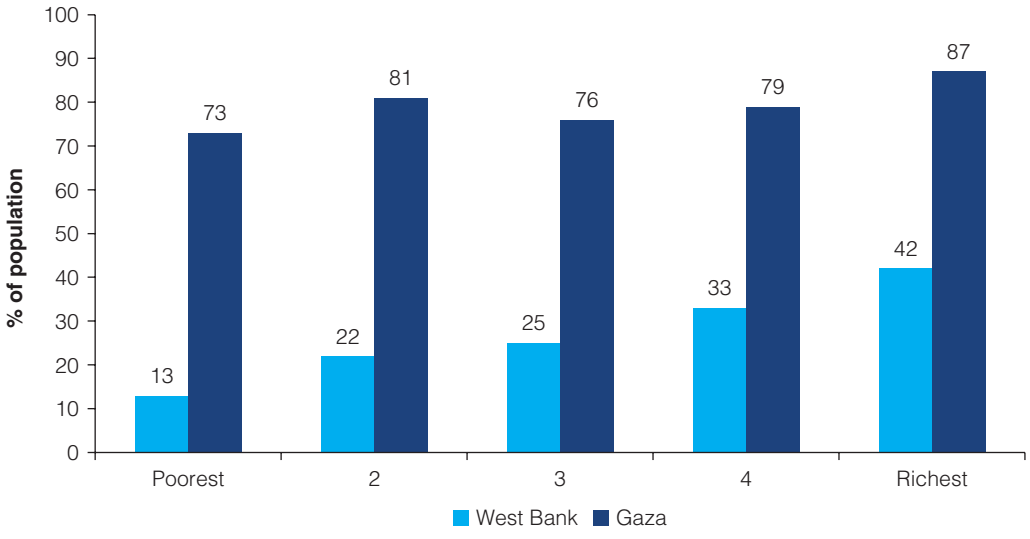
The likelihood of sewage overflow is substantial across different types of sanitation, including improved types. SDG criteria are stricter than MDG requirements. A household

Table 3.4: Types of Sanitation by Regions and Governorates, 2016, % of population

	Improved sanitation (including shared)	MDG, improved sanitation, unshared	Flush to sewage	Open defecation
Total	99	96	49	0
Region				
West Bank	98	94	30	0
Gaza	99	99	78	0
Governorates				
West Bank				
Jenin	97	95	9	0
Tubas	98	98	0	0
Tulkarm	99	98	39	0
Nablus	99	85	49	0
Qalqilya	100	97	59	0
Salfeet	99	89	12	0
Ramallah and Al-Bireh	97	94	26	0
Jericho	96	89	26	0
Jerusalem	96	91	32	0
Bethlehem	98	93	37	0
Hebron	99	98	27	0
Gaza				
North Gaza	99	99	93	0
Gaza	99	98	93	0
Deir al-Balah	99	99	77	0
Khan Yunis	100	99	37	0
Rafah	100	99	64	0

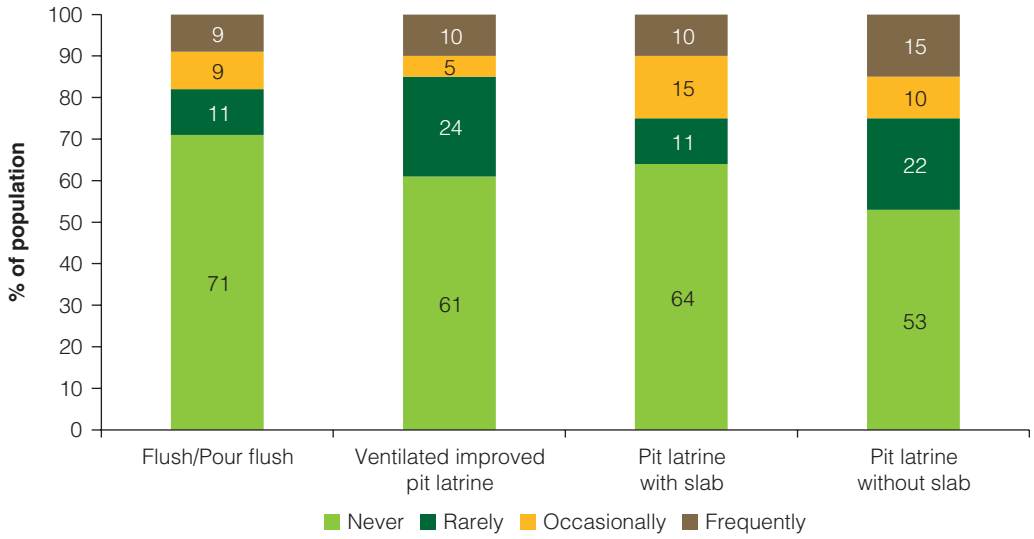
Source: LGPA 2016.

Figure 3.18: Flush to Sewage Connection across Asset Index Quintiles by Region, 2016, % of population



Source: LGPA 2016.

Figure 3.19: Overflow Occurrence across Different Types of Sanitation, 2016, % of population



Source: LGPA 2016.

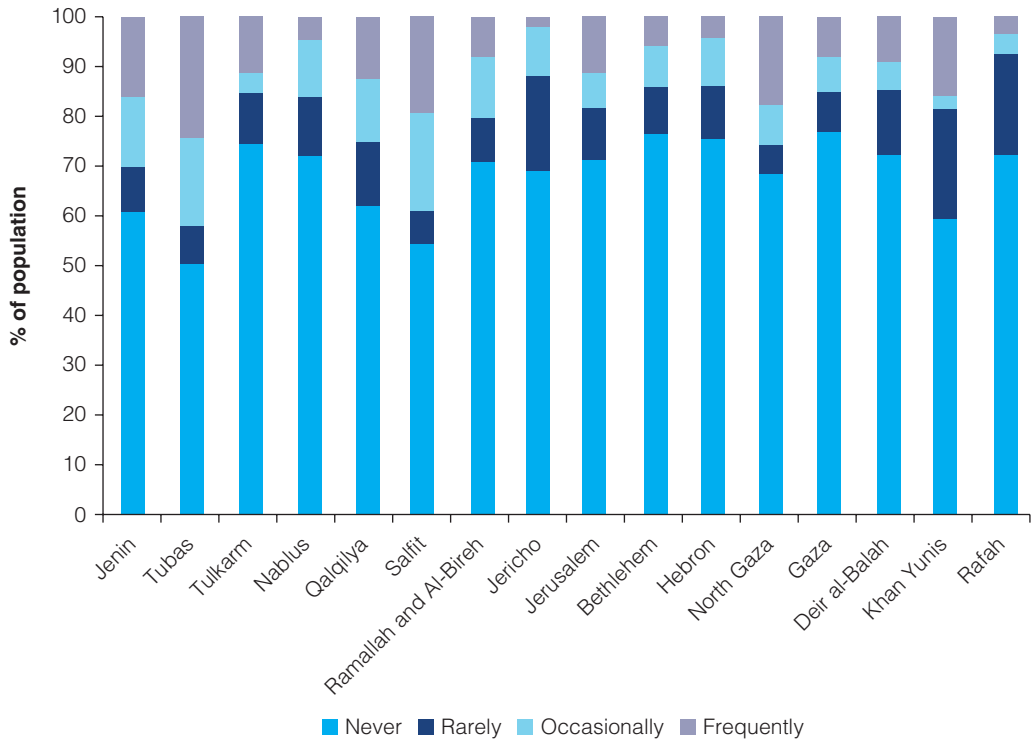
must not just use an improved (nonshared) facility, as was the case under the MDGs. The MDG standard called for verification of immediate appropriate containment of the human waste. Under the SDGs, there must also be verification of appropriate end-use/disposal (including emptying, transport, and treatment, as relevant). From analysis of the entire sanitation chain, an estimate of the final percentage of people using "safely managed" sanitation, according to the SDG indicator, can be calculated. While this involves integrating administrative data (from service providers and other sources) with household survey data, the LGPA data give some insights because the survey asked a question about sewage overflow.

In particular, the data show that the risk of overflow exists across all types of sanitation facilities in West Bank and Gaza (figure 3.19). Not surprising, the highest frequency happens among the population using pit latrines without a slab. Overflow happens frequently (more than 12 times a year) or occasionally (3–12 times a year) among 25 percent of population who use pit latrine without slab. Given that less than 1 percent of population use this source of sanitation, it is not a big problem. However, what is worrisome is that 18 percent of the population using the improved sanitation types flush or pour flush experienced frequent or occasional overflow. These additional criteria will be taken into consideration for the SDG calculations of access to safely managed sanitation.

Sewage overflow occurs more frequently in the northern governorates of the West Bank region. Figure 3.20 reports the risk of sewage overflow across governorates. Tubas, Salfeet, and North Gaza had the highest percentage of population experienced sewage overflow at least once in a month in 2016. Figure 3.21, which presents a breakdown by LGU, also shows that the risk of sewage overflow is the lowest in the southern governorates.

The poor are more likely to experience sewage overflows (figure 3.22); however, this relationship is much stronger in Gaza. After controlling for LGU residence, the wealth gradient remains significant only in Gaza. Consistent with poor households' lower connection to the piped sewage system, the occurrence of sewage overflow is highest among those from the poorest

Figure 3.20: Sewage Overflow Occurrence across Governorates, 2016, % of population



Source: LGPA 2016.

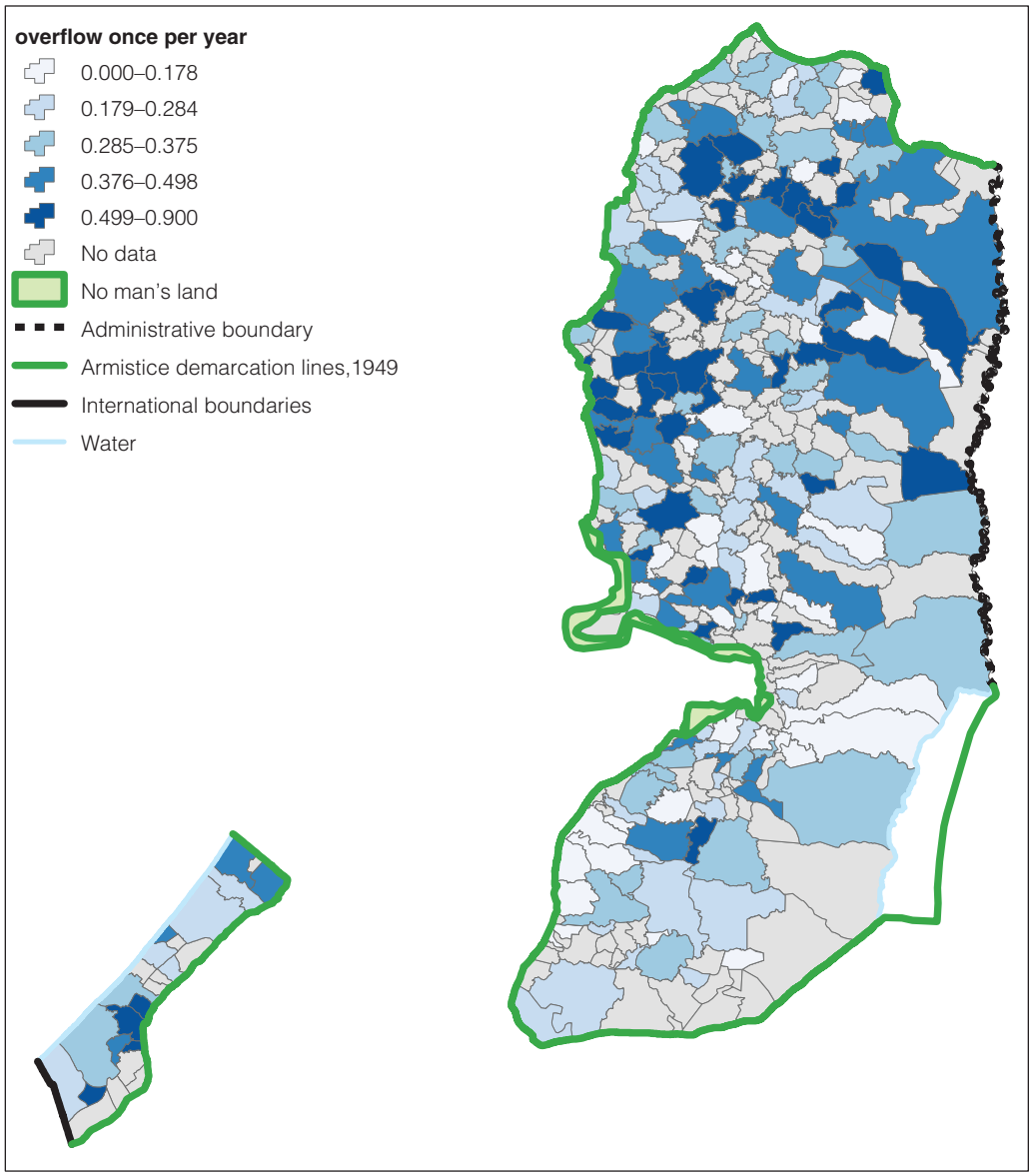
asset quintile. For example, 17 percent of the population from the poorest quintile in Gaza experience sewage overflow once a month, compared to only 3 percent among the top quintile. This pattern is also evident in figure 3.23, which plots the relationship between the shares of population in the bottom 40 percent in each LGU against the share of population experiencing sewage overflow at least once a year.

To disentangle location effects from wealth effects, a multivariate regression was run to explain the probability of having a sewage overflow once in a year by residence in a particular LGU and by wealth index quintiles. In the West Bank, no statistically significant differences in the probability of having an overflow was found across quintiles. In Gaza, however, the probability of overflow was significantly different across quintiles. For example, the probability of sewage overflow once a year drops from about 35 percent in the poorest quintile to 9 percent in the richest asset quintile.

Inadequate Quality of WASH Services is More Important than the Cost of Service, and in Gaza, this is Linked to High Rates of Nonpayment

Access to improved water sources and sanitation should be based on the principle of equity. The costs of services should not impose an excessive burden on households. At a minimum, this principle suggests that prices for consumers should not be so high as to lead them to curtail consumption of these services below recommended norms or impose other financial and nonfinancial costs on household consumption patterns.

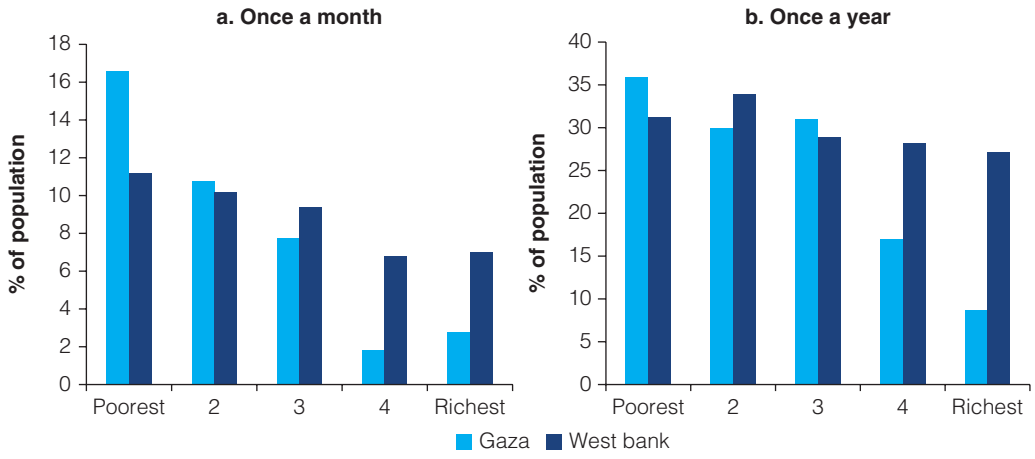
Figure 3.21: Share of Population Reporting Sewage Overflow at Least Once a Month across LGUs, 2016, % of population



Source: LGPA 2016.

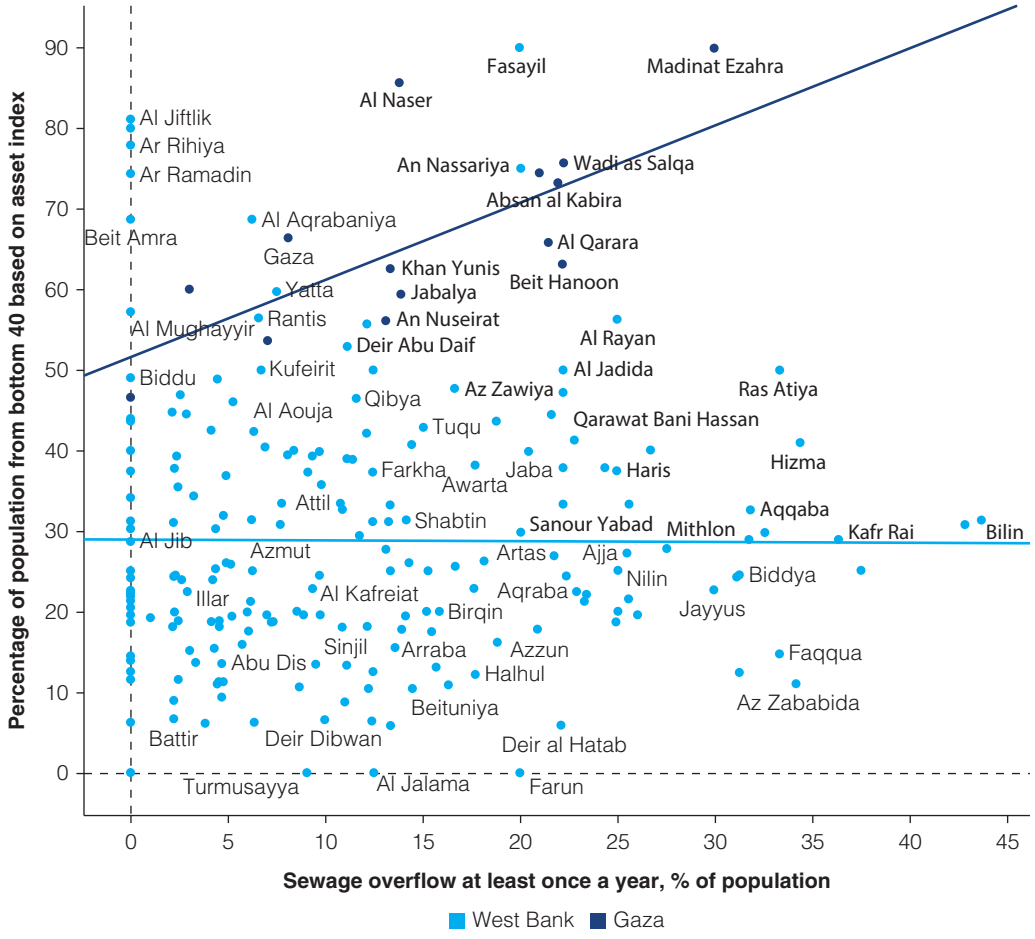
The most common indicator to track affordability compares monthly water and sanitation bills to total disposable income or consumption. The only survey that collects detailed household expenditure information on all goods and services is PECS. The latest data available are for 2011. According to PECS, the population in the Palestinian territories spend 1.7 percent of their budgets on water fees and 0.1 percent on sewage, on average (table 3.5); shares are slightly higher for the poor (2.4 percent and 0.2 percent, respectively). While people in the poorest quintile tend to spend smaller absolute sums on water and sanitation in per capita terms, given their low levels of total consumption per capita, their expenditure shares are higher than for the wealthier population. Because connection rates to piped sewage are higher in Gaza than in West Bank, the population in Gaza is more likely to have spent something (that is, have a non-zero

Figure 3.22: Frequent Sewage Overflow Occurrence across Asset Quintiles by Regions, 2016, % of population



Source: LGPA 2016.

Figure 3.23: Share of Population in Bottom 40 Based on Asset Index and Share of Population Experiencing Sewage Overflow at Least Once a Year, 2016, %



Source: LGPA 2016.

Table 3.5: Distribution of Water and Sewage Expenditure by Consumption per capita Quintile and by Region, 2011

	Percent				Per capita annual expenditure, NIS				
	Share of water expenditure	Share of sewage expenditure	Population with non-zero expenditure on water	Population with non-zero expenditure on sewage	Water, including zeros	Sewage, including zeros	Water, excluding zeros	Sewage, excluding zeros	Total consumption
By consumption per capita quintiles									
Poorest	2.4	0.2	96	40	–92	–7	–96	–18	3,819
2	1.8	0.1	97	36	105	–8	108	–22	5,887
3	1.7	0.2	97	32	134	13	137	–39	7,903
4	1.5	0.1	98	24	164	10	167	–41	10,917
Richest	1.2	0.1	99	18	250	18	254	102	21,111
By region									
West Bank	1.8	0.1	–96	–6	178	–9	185	169	11,399
Gaza	1.6	0.2	100	69	101	14	101	–20	7,535
Total	1.7	0.1	–98	30	149	11	153	–37	9,924

Source: PECS 2011 data and WASH-PD team calculations.
Note: Expenditures are spatially adjusted. Zeros = those who spent nothing on water and sewage; PECS = Palestinian Expenditure and Consumption Survey.

(positive) expenditure) on sewage. Overall, average amounts spent on sewage per capita are much lower than amounts spend on water, regardless of whether those who spent nothing (had zero expenditure) were included or excluded. Shares do not vary much across regions (table 3.5).

The LGPA survey collected information on monthly amounts that households spend on water and sewage in 2016. Many households did not know the amounts they spent. For those who reported, including those who reported they spent nothing, the annualized per capita values on all consumed water range from NIS161 for the poorest quintile, based on the asset index, to NIS392 for the richest quintile. Annualized average expenditures on sewage are much lower than expenditures on water because many respondents reported spending nothing. Averages range from NIS10 for the poorest population to NIS28 for the richest.

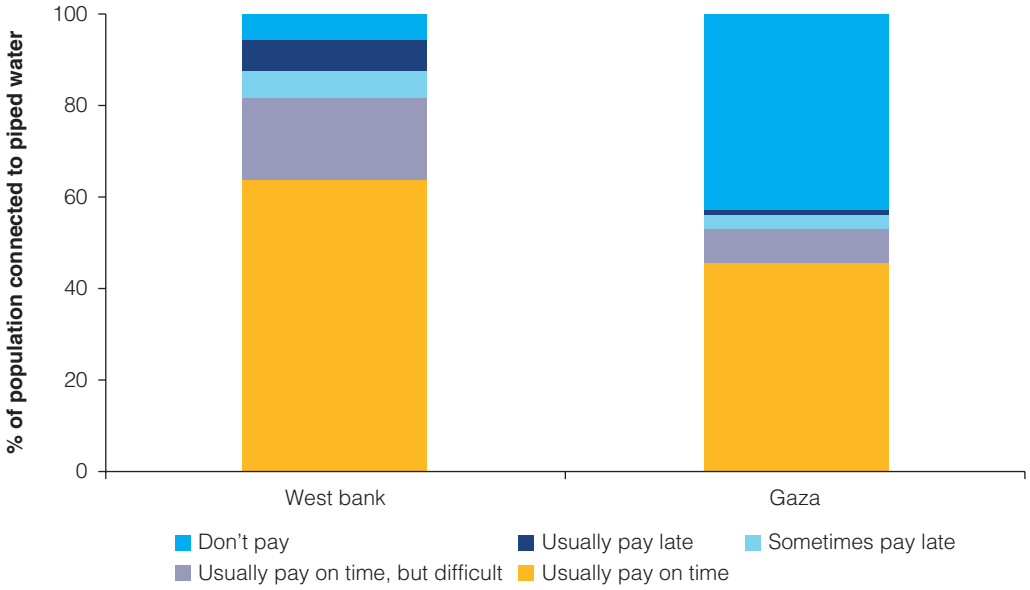
While the shares of actual expenditure on water and sanitation in household budgets remain moderate, about one-third of the total population is dissatisfied with the cost of piped water and one-fifth is dissatisfied with the cost of public sewage. High water costs were mentioned by less than 10 percent of the population as the key problem with piped water (figure 3.13). Nevertheless, the LGPA survey also explicitly asks whether the population is satisfied with costs of piped water supply and piped sewage. About 35 percent of population were dissatisfied or very dissatisfied with costs of piped water. Levels of dissatisfaction with piped sewage were lower: about 19 percent of the population. Respondents were also asked about the maximum amount they would be "willing to pay for piped water." Table 3.6 shows the average amount paid across asset quintiles, along with average actual amounts paid for all water. Across the distribution, households reported a maximum willingness to pay amount that was less than the amount they actually paid in 2016. It should be noted, however, that this measure of willingness to pay is not reliable because it does not follow best practice on how this question should be asked. However, given the rest of the evidence, the low acceptance of the current costs of water could reflect the low quality of services provided.

Table 3.6: Average Actual Payment for All Water and Maximum Payments on Piped Water across Asset Index Quintiles, 2016

Quintile	Actual payment for all water per year, NIS	Maximum annual payment for piped water per year, NIS
Poorest	161	94
2	214	141
3	247	171
4	282	204
Richest	392	284
Total	259	178

Source: LGPA 2016.
Note: Monthly reported values were annualized. The responses "Do not know, no answer" were tabulated as missing.

Figure 3.24: Bill Payment for Piped Water across Regions, 2016, % of population connected to piped water

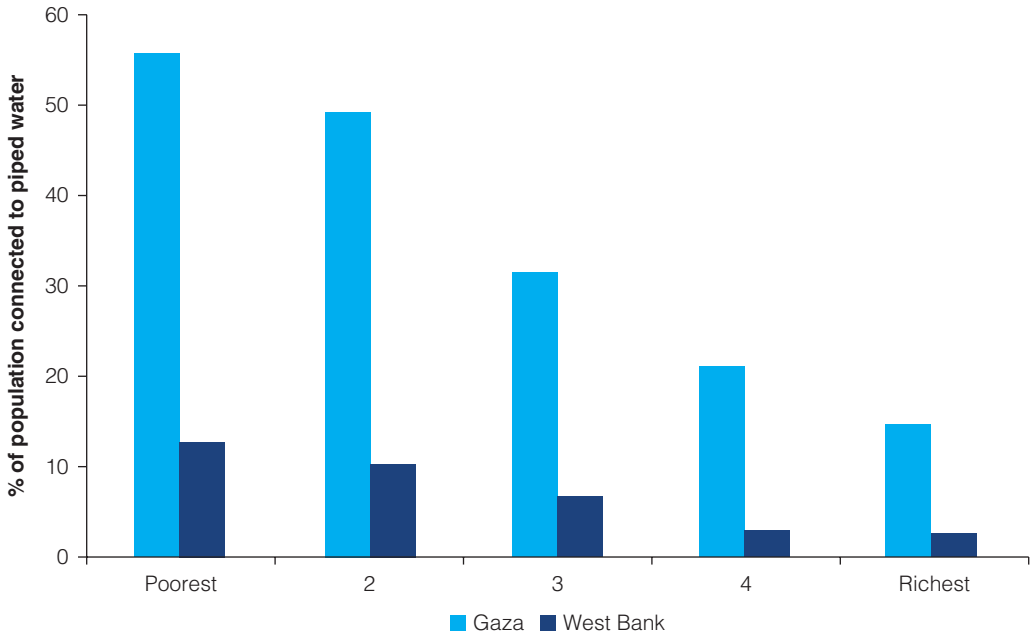


Source: LGPA 2016.

Almost 30 percent of the overall population connected to piped water paid their water bills late, or did not pay at all for piped water. This share is much higher in Gaza, where 43 percent of population report no payment (figure 3.24). While this share is much less in West Bank, around 19 percent of population still pay late or do not pay at all.

Nonpayment is strongly correlated with welfare in Gaza. Figure 3.25 shows the percentage of the population not paying for piped water across asset index quintiles in Gaza and West Bank. The gap between the rich and poor in Gaza is substantial. Thus, among the richest households, only 15 percent do not pay, while among the poorest households, about 56 percent do not pay for piped water.

Figure 3.25: Nonpayment for Piped Water by Asset Quintiles across Regions, 2016, % of population connected to piped water



Source: LGPA 2016.

Notes

1. The MICS 2014 sample frame was based on updated enumeration areas in 2013, but the weights were not adjusted to reflect official population projections from the Palestinian Central Bureau of Statistics. The LGPA 2016 sampling frame was based on satellite images, and weights were adjusted for official population projections. Given that all surveys are representative at the governorate/regional levels and WASH indicators are constructed using a similar instrument in a consistent manner, the subnational estimates should be comparable across data points.
2. Results presented in this section should be treated with appropriate caution. PECS 2016–2017 is in the field. It is expected to provide the most recent information on poverty and the spatial distribution of the bottom 40 percent of the population.
3. For example, using the MICS wealth index for 2014 data indicates that almost 100 percent of the population in the bottom quintile is concentrated in the Gaza region. This result is different from results derived by using PECS 2011.
4. The alternative asset index created for this Diagnostic is henceforth referred to as the consistent wealth index.
5. Robustness tests are done for assets index in MICS based on total population including those residing in camps, while in the trends section, an asset index is constructed for the population excluding those residing in camp to be consistent with indicators for improved water and sanitation. Results do not change whether camps are included or not.
6. The results from a logit regression, which explains the likelihood of a household having access to improved water against a range of characteristics, also confirm the primacy of regional effects over wealth in explaining the differential access to water in West Bank and Gaza. Results are available upon request.
7. PWA 2015a, 2015b.
8. PWA Gaza database; CMWU database; communications with Ahmed al Yaqoub and Rebhy Sheikh, PWA; Messerschmid (2008).

9. Data on groundwater quality in West Bank are limited to selected wells located in the Jordan Valley, Qalqiliya, and Tulkarm. Water testing shows that most of the wells in the Jordan Valley have a high concentration of chloride, exceeding the acceptable guideline set by the World Health Organization (WHO) (250 mg/l), while the nitrate concentration is quite low (PWA 2013). In Tulkarm and Qalqiliya, the nitrate concentration exceeds the WHO allowable limit (50 mg/l) in some wells, while the chloride concentration in these wells remains within acceptable limits (PWA 2013; ARIJ 2016, 53).
10. This relationship holds if a simple probit regression is used to control for the governorate where households live. Still, due to very small sample size, this result should be treated with caution.
11. Similar regressions cannot be run in Gaza because there is no variation in many LGUs; thus, these observations were dropped from the analysis.

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Part 2

Challenges and Responses

Drinking Water Fountain in Gaza

Palestinian Water Authority's Communication and Media Department.

Based on the description of the water supply, sanitation and hygiene sector and of outcomes in Part 1, Part 2 assesses the challenges faced by the sector. Chapter 4 looks at factors influencing service delivery performance and, based on case studies, identifies four elements that are key to improving sector performance – institutions, water resources, investment, and incentives (IWII). Chapter 5 reviews the current plans for sector reform and progress on those plans. The chapter also identifies key constraints to improving sector performance and service delivery, which are analyzed in detail in Part 3.

Chapter 4
Factors Affecting Service Provision and Case Studies of Different Approaches

Part 1 set out the current situation of the provision of WASH services in West Bank and Gaza, highlighting both strengths and weaknesses. Despite high network coverage, water service delivery is often poor, with intermittent supply, high levels of physical losses and other non-revenue water, and large variations in per capita supply between communities. In Gaza in particular, despite almost universal access to household connections, water quality is so poor that almost everyone must resort to expensive tanker water for drinking purposes

Although network water is affordable for most, tariffs vary widely in West Bank and many consumers – particularly the poor in Gaza – are reluctant to pay their water bill. Overall, the technical and financial performance of many West Bank service providers (SPs) is poor and many do not recover enough of their costs to be viable. Problems are worse in Gaza, where service providers lose 75 cents on every dollar. Overall, the sector is running a substantial deficit of up to $70 million a year, which must be covered by the Palestinian Authority (PA).

Access to improved unshared sanitation is very high across the country, but with low levels of network connection and wastewater treatment in West Bank. Sewage is consequently a major health and environmental problem, particularly in West Bank, and the absence of any reuse in both territories wastes a potential water source.

The overall picture is thus of a sector where considerable investment has put in place the infrastructure for relatively high service levels but where services have been deteriorating in recent years – to the extent that some locations, particularly Gaza, now verge on crisis. This chapter examines factors affecting service levels and differences in service levels among providers.

Factors Influencing Service Delivery Performance

Context

The ability of service providers to deliver services is influenced by many factors over which SPs may have little control. On the supply side, the most important factor influencing performance is the availability of bulk water, which is highly variable across providers. The source of water is also extremely important. Service providers with access to their own wells or springs generally have more abundant and cheaper water than those that are highly dependent on water purchases from the West Bank Water Department (WBWD) and Israel. Physical factors also influence performance and costs, notably topography: very hilly locations have much higher investment and operating costs than those on level ground. On the demand side, demand is rising with the rapid increase in the population and changes in lifestyle. At the current low levels of supply, however, there is little room for demand management measures.

In the charged regional context, politics is inevitably a complicating factor. The overlap of water and politics in the regional political situation generates a set of particular constraints. The interdependence of West Bank and Gaza and Israel on shared water resources was codified in Article 40 of the Oslo Accords (see Chapter 9) but continues to generate issues. Investment in water infrastructure is greatly constrained by the Joint Water Committee (JWC) process and by movement and access restrictions. Palestinians' ability to provide and manage water services in Area C is limited, leaving many Palestinians unconnected and posing challenges of controlling non-revenue water. Commercial relations over water and sanitation are highly charged: Israel deducts charges for bulk water and for treating West Bank sewage unilaterally from tax receipts; arrangements for rebate of the value added tax (VAT) are cumbersome; and access to extra quantities of water from Mekorot are diplomatic and strategic issues rather than commercial purchases. In much water discourse, there is a link assumed between water and sovereignty that constrains planning, often making plans unrealistic, and impeding consideration of what may be more pragmatic solutions.

Internal polices related to water also limit room for improving service provision. Cost recovery is constrained by nonpayment by public bodies; by the special status of refugees and families of martyrs and prisoners; and by the legal framework for enforcement and its application, including recovery of arrears from households and from service providers. A pervasive awareness in the political context of the need for fairness to constituencies raises questions over the allocation of investment and water resources that cannot always be answered, either because of physical or financial impossibility or because of the need for discretion in raising issues that are sensitive in the broader political context. Consider the case of Yatta, a very water-short community (featured in a case study of a municipal water department in the next section). The question, "*Why doesn't Yatta receive more water?*" does not have an answer – and certainly not a simple one that could easily allay local sensitivities.

Capacity Factors

High standards of service provision require service providers to have a range of capacities. These include strategic planning for bulk water and investments, management capacity, adaptable organizational structures and systems, and human resource development. Water supply and sanitation services need to be run on a business-like basis. Cost control and cost recovery are essential to viability. There need to be separate accounts, ring-fenced finances dedicated to water supply and sanitation, and a focus on collections. Particularly where service providers are embedded within municipalities or are relatively small, it may be difficult to acquire these competences and incentivize staff.

Many systemic constraints limit these capacities. While all these capacities exist in varying degrees within Palestinian service providers, with many outstanding examples of success, service providers face many systemic constraints. They lack the access to higher-level planning for water resources and investment needed to make realistic strategic plans (see Chapter 8). Although there are many skilled and motivated managers in the sector, current incentives for professionalism and support for capacity building are limited (see Chapter 6). Support to update organizational structures and management and technical systems to meet expanding and new needs is patchy, and is generally tied to donor projects. Human resource development needs to be strengthened. It is likely that the establishment of the new industry self-help body, the Union of Water Service Providers, will be of significant help in this regard.

Cost control and cost recovery are essential to viability, but most costs faced by service providers are hard to control. Water purchase costs and energy costs are typically important components and are difficult to reduce.[1] Personnel costs per m^3 sold are also important components and may be hard to reduce. Each service provider must identify where costs can best be reduced. For many SPs, the best candidate is reducing technical and commercial losses, and that should be the focus. However, there is need for caution in trimming costs: too many SPs are neglecting or delaying maintenance – necessitating many rehabilitation projects.

Water needs to be run on a business-like basis, but there are many constraints to doing so. Three-quarters of service provision is by local government units, typically municipal water departments that usually do not keep separate accounts for water or ring-fence water department finances. In fact, for many municipalities water services are a "cash cow" and there are perverse incentives to *not* having separate accounts or ring-fenced finances (see Chapter 6). Tariff setting and collection efficiency may also be subject to local influences. Political support is needed to overcome the difficulty in enforcing disconnection or prosecution for nonpayment. Service providers are progressively overcoming these problems and applying new ideas – including pre-paid meters, installment payments, modern methods like PayPal and mobile collections, links to electricity billing, or access to other municipal services – but there is still a long way to go.

Governance, Transparency, and Accountability

Governance arrangements and practices help good performance. In general, higher levels of responsibility and managerial autonomy to service providers coupled with incentives to strengthen accountability tend to produce better service outcomes. The largest Palestinian service provider, the Jerusalem Water Undertaking (JWU), for example, has an independent board of directors, which empowers management to run the enterprise on a business footing. This structure appears to have helped protect JWU's autonomy from political interference and contributed to JWU's long record in quality service provision and the strong donor support it has received for decades.

A related imperative is financial autonomy. Unless service providers can cover their costs, they can never achieve financial autonomy. The current situation in many service providers of setting tariffs too low and recovering only part of the costs billed to consumers leaves the providers dependent on top-down support for financing investment and obliges them to have recourse to stratagems like not paying for bulk water in order to finance operating deficits. Again, JWU can be cited as an example of the benefits of financial autonomy. With a working ratio in 2014 of 0.91,[2] JWU billings covered its costs with a 10 percent margin, and a collection efficiency of 98 percent has generated a positive cash flow that could then be reinvested in the business. However, few other service providers are currently generating a positive cash flow.

Transparency and the quality and extent of external relationships are also critical determinants of service providers' performance. Utilities need to maintain close reciprocal relationships with the local government units that they serve, and forge strong relationships with consumers. Good performers like JWU invest in consumer outreach through social media, the Internet, films, awareness campaigns, and radio spots, as well as providing "one stop services" and responsive grievance redress mechanisms. Good relationships with consumers contribute enormously to promoting good payment behavior and water conservation, and to stigmatizing illegal connections. Even when systematic or seasonal shortages occur, transparency and communications – such as publication and adherence to a delivery plan during summer shortages – can go a long way toward allaying consumer ire.

Vertical and horizontal accountability to all stakeholders is essential. Accountability should go beyond vertical relations (to and from central agencies and consumers) and should extend to horizontal relationships with relevant partners. Examples include participation in community endeavors and outreach activities, such as in schools; relations with the media; cooperation on environment health matters; coordination with police and the Public Prosecutor (which will help in enforcing collections); and participation in urban and rural planning. Again, the best providers in West Bank do such things.

Learning from Experience: Case Studies of Service Providers

Each service provider operates within a unique set of constraints. The different context, capacity, and governance factors examined above all apply differently to each of the more than

300 service providers. In an exercise to try to draw out common factors of success, this study examined 12 service providers in detail. This section discusses four of these cases to try to identify common themes.

A Utility

JWU owes its relatively good performance to its status as an autonomous utility and to the related good governance and dynamic and forward-looking management. JWU was established in 1966 by separate statute under Jordanian law. Today it is delivering a fairly good quantity of water of high quality, albeit at a relatively high price. Operating efficiency is about average and financial viability is relatively good, with sales and collections covering costs. The strengths of the JWU operation are:

- Its autonomous status established by a separate law, and its accountability to an independent board.
- Its accountability to customers, with broad outreach and communications, a dedicated customer service department, and transparent complaints procedures.
- Its accountability and relations with other partners, notably municipalities and civil society.
- Its provident outlook, with short-term programs focusing on controlling costs and increasing cost recovery, and long-term plans targeting increased bulk water and reduced physical losses, matched by demand management measures.
- Its financial and business management, with tariffs set at full cost-recovery levels, its cost control, its attention to creating consumer responsibility, and vigorous collection of current and past dues.
- Its recognition of the importance of good leadership, business-like management, and motivated and qualified employees.

JWU operates within some pressing constraints: limited and high-cost bulk water availability, and rapidly growing demand. Costs are likely to increase and JWU will have to work hard to persuade consumers that service remains good value. Overall, the emphasis on accountability and the relatively good service has created a sense of ownership among stakeholders and helped protect JWU's autonomy. Indications are that JWU's autonomous status, its good governance, and dynamic and provident management will enable it to weather these constraints and continue to provide good services.

A Joint Service Council (JSC)

The JSC statute provides for "utility-like" governance and accountability. In a move to help smaller communities group together to provide services more efficiently, the Ministry of Local Government (MoLG) introduced the Joint Service Council (JSC) statute.[3] This statute provides for a separate board accountable to the participating communities, ring-fenced finances and separate accounts, and management accountable to the board. To date, 13 JSCs have been set up in the water supply and sanitation sector, with varying results.

Aqraba Joint Service Council provides an example of competent management of a local water supply scheme that is high cost but well appreciated. The Council, set up in 2000 to provide services to 15 LGUs, demonstrates that a JSC can provide good water service – albeit at relatively high cost. Factors that have helped the JSC to perform well are: cooperation with the Palestinian Water Authority (PWA), the West Bank Water Department (WBWD), and external

financiers; a ring-fenced operation with sound governance; and efficient management and good consumer outreach. The JSC has been successful in making connections within Area C, which has generally proved difficult due to movement and access restrictions. Specific factors in the success of the Aqraba JSC include:

- *Governance*: A board of nine members represents the larger Village Councils (VCs) that own the JSC. None of the Village Councils derive any revenue from the water operation.

- *Operations*: The JSC has set up an efficient network to supply over 8,000 households on a 24/7 basis. Although the scheme is relatively high cost (€1,500/connection), subscribers have been willing to connect, paying a connection fee that covers about one-third of the cost. There are five technical staff and a manager.

- *Accountability to customers:* The JSC maintains 11 customer relations officers and has a grievance redress mechanism, which appears to be working as designed.

- *Financial autonomy and financial management*: The water supply operation is ring-fenced, with its own bank account and financial accounting system. Tariffs are set to recover the full costs of operation and maintenance (O&M) and to build up a capital reserve. The JSC practices a block tariff, with the lowest block for domestic customers at NIS4.98/m^3 and the highest at NIS9.00/m^3. Industrial and commercial customers pay a flat NIS8.00/m^3. Any subsidies to consumers (for widows, families of martyrs, and the like) are paid by the Village Councils. The collection rate is about 95 percent. All domestic and business customers pay in advance. The JSC adopted prepaid meters, which required an initial investment in customer relations but which are apparently going well. Credit is extended only to public bodies – and it is these bodies that tend to be behind in paying their water bill.

During the team's field visit in December 2016, Ghalib Farrah, the mayor of Jurish, one of the 15 participating communities, confirmed the overall satisfaction of his people with the service. The cost was considered on the high side, but there was universal satisfaction with the quality and with the 24/7 availability. "This is a project for all the community. For the first time, we have continuous supply," he said.

A Municipal Water Department

Municipal water departments (WDs) operate under the Local Authorities Law without specific water-related institutional provisions related to water service delivery. About three-quarters of water services are provided by municipal water departments under the 1997 Local Authorities Law, which assigns responsibility for water supply and sanitation services to local government under the jurisdiction of the MoLG. There is no specific provision for organizing or managing these services. Performance and results vary widely. One case study of a poorly performing water department – Yatta – can provide lessons.

For the Yatta Water Department, water shortages leave little room for maneuver. Yatta, a populous and fast-growing municipality in the southern part of West Bank, is desperately short of water and has the one of the lowest per capita supply rates in the country: less than 26 liters per capita per day (lcd), compared to the West Bank average of 75 lcd. Key factors affecting performance are:

- *Governance*: The water department is embedded within the municipality and reports to the mayor and municipality council rather than to a dedicated water services board.

- *Operations*: Yatta is largely dependent on purchased supplies from WBWD/Mekorot that are far below needs. The line from Mekorot has a delivery capacity of 1,100 m^3/hour, but Yatta receives only 200 m^3/hour, on average. The water department delivers

water every two to three months through an aging network. The cost is high (NIS5.90/m^3, compared to the West Bank average of NIS5.00/m^3) and the quality of the water is poor.

- *Accountability to customers*: There is a grievance redress mechanism, but expectations are so low that most households have given up and disconnected from the system. There are currently only 3,800 metered connections for a population of 87,000 (about 14,000 households). Households cope by buying tanker water, harvesting rainwater, and using extensive private storage.

- *Financial autonomy and financial management*: Finances are not ring-fenced. The water department works on a cash basis and its accounts are not published separately from the general municipal accounts. The system is running at a huge loss. Most people do not pay their bill (the collection rate is 40 percent, compared to a West Bank average of 67 percent). In turn, the municipality does not pay WBWD – and diverts water revenues to the general treasury. However, the Ministry of Finance and Planning is now deducting both past and current water dues from transfers, and the municipality is suffering a financial crisis.

On the plus side, the water team is dedicated and the city council desperately wants to do something to improve – but what? Improvements like prepaid meters to increase collections and action on non-revenue water are under consideration. But essentially the first and essential step to improving the situation is – more water. Yatta is simply hoping that PWA will allocate the municipality extra water. It has requested more bulk supplies from PWA.

A proposed $20 million investment project for Yatta would make sense only if there were adequate bulk water combined with institutional changes to put water supply on a business-like basis. The investment program accompanying PWA's 2017–2022 Strategic Development Plan provides for a $20 million project for rehabilitation of the Yatta internal network and construction of water tanks. The United States Agency for International Development (USAID) has reportedly expressed interest in financing this project, but feasibility would first require assurance that more bulk water is available and that institutional changes would be made to put the water operation on a business-like footing through ring-fenced finances, separate accounting, cost recovery, and payment of WBWD/Mekorot bills.

A Village Council (VC)

Village Councils can also run efficient operations with a high degree of consumer satisfaction, but the arrangement at the village level may forego economies of scale. Under local government legislation, Village Councils are empowered to supply water services to their community. Case studies demonstrate that this model can provide the governance, accountability, and financial autonomy needed to run an efficient service. In some cases, "small is beautiful." A Village Council is close to the population it serves, so accountability is high. However, as in the case of Farkha, economies of scale may be foregone.

The case of Farkha Village Council shows that a VC water operation can provide good governance and accountability and efficient water service. Farkha VC near Salfeet runs a small scheme supplying adequate water at a reasonable price. The VC prefers its independent status. It has concerns about being sidelined if it increases its reliance on the neighboring municipality and thus is reluctant to work through a Joint Service Council. Key factors in the VC's success include:

- *Governance*: The water operation is overseen by the elected Village Council, which is accountable to its electorate. The VC does not seek any financial gain from the water operation but seeks to run it on a business-like basis.

- *Operations*: The VC provides 24/7 service of up to 150 lcd to 400 households for most of the year. In the summer, water shortages occur, and residents must buy tanker water. Almost all households also harvest rainwater.

- *Accountability to customers*: In this small community, the VC is directly accountable to residents.

- *Financial autonomy and financial management*: The water operation keeps its own accounts and has its own separate bank account. The tariff, which is close to the average for the Palestinian territories, is set at the break-even point. The collection rate is 100 percent. When consumers come to pay for electricity (which is cut off if the bill is unpaid), they are first required to pay their water bill.

There are, however, disadvantages to being small. The scheme is largely dependent on Mekorot water piped via Salfeet Municipality. To link the village with an operation with economies of scale and to provide for more rational planning of bulk water distribution, MoLG has encouraged the VC to link up supply in a JSC operation. However, villagers are not keen to do this, as it would increase their dependence on Salfeet Municipality, which is the dominant partner in an existing JSC that Farkha is reluctant to join. The VC would prefer to increase its water autonomy rather than rely on Salfeet's cooperation. They have identified a nearby spring as a new source. However, tapping this source would require cooperation of PWA (and JWC consent) and support through a nongovernmental organization (NGO) or donor. The VC fears that the village is too small to qualify for this cooperation and support, and that with its current reasonable level of service Farkha may not be considered a priority.[4]

Main Findings from the Analysis and Case Studies: The Importance of Institutions, Water Resources, Investment, and Incentives (IWII)

Main findings from the analysis and the case studies suggest that improving service delivery in West Bank and Gaza depends on a combination of four factors: institutional status and environment, water resources, investment, and incentives.

Institutional status and environment: Service providers need a legal status that can provide effective governance, accountability, financial autonomy, and efficient management. Several different legal statutes can provide this. Although some municipalities have established these conditions for their water departments, most are constrained by problems that relate to their institutional status: unclear governance structure and accountability; lack of independent accounting or financial management; confusion between water as a business and water as a (subsidized) public good; persistent deficits; no firewall between water finances and other municipal finances; and inadequate working and investment capital to maintain and improve services. There is no strong evidence that larger or smaller service providers necessarily perform better or worse, although there are some economies of scale in both planning and operations. The institutional environment is also an important factor: service providers need to be accountable upward in a supportive regulatory framework and to operate within a well-functioning and responsive planning and investment system.[5]

Water resources: Although there is much that service providers can do to eke out supplies and reduce non-revenue water, adequate bulk water supplies are essential to good service delivery. Improving services requires coherent planning and equitable allocation of bulk supplies, planning and investment in distribution infrastructure, and equitable and predictable distribution at fair prices.

Investment: Access to a structured and participatory investment planning and financing process is vital to develop water services equitably.

Incentives: Incentives to good service delivery and good staff performance are likely to be higher where water operations are set up on a business-like basis with financial autonomy, managerial empowerment, and progress toward full cost recovery and with commensurate accountability to customers.

These four elements – institutions, water resources, investment, and incentives (IWII) – are the key to improving sector performance. The next chapter examines how these elements are addressed in the current reform program. Part 3 of this report then examines the constraints that have contributed to slow progress in working on these four elements to improve service delivery.

Notes

1. This raises a key question of fairness. Citizens of a relatively poor town like Dura may well think it unfair – even if they understand the rationale – that they must pay NIS6.50/m^3 for limited supplies and poor service when the residents of Jericho pay less than one-third of that (NIS2.17/m^3) and have water in abundance.
2. The working ratio is defined as the ratio of operating costs to sales (> 1 = deficit). See chapter 1 for a discussion.
3. Joint Service Councils (JSCs) enjoy a legal status similar to that of utilities: they report to a governing board; they maintain separate accounting and bank accounts; they generally balance their books and build up reserves for replacements; and they are close to and accountable to their customers.
4. Findings are based on a case study and field visit in December 2016.
5. The fact that service providers with various institutional forms can perform comparatively well confirms the finding that no single factor determines performance. For example, several municipal water departments, including Beitounia, Salfeet, and Yabad, perform well on some indicators. Clearly there is no single ideal template or unique reform path. Each case should be examined individually and results of change programs should be monitored. See the discussion in Section 6.4 in Chapter 6.

Chapter 5
The Current Reform Program and Planned Structure for the Water Sector

Sector Reform since 2009

In 2009, the Palestinian Water Authority (PWA) started taking steps toward the comprehensive reform of the water and sanitation sector. In the 2000s, PWA identified a series of constraints to water supply and sanitation services: pressing water scarcity, a growing imbalance between supply and demand for water, and emerging problems at both the bulk and retail service levels in providing efficient, equitable, and sustainable water supply and sanitation services. A major concern was the "jungle of service providers" – the several hundred service providers, large and small, operating without regulation and sourcing water haphazardly. PWA led a thoroughgoing process of debate and study throughout the Palestinian territories, which resulted in agreement in 2009 on the need for comprehensive sector reform based on best-practice guiding principles (table 5.1).

Sector reform was mandated by the 2009 Action Plan for Reform and the 2014 Water Law. On December 14, 2009, the Cabinet endorsed the *Action Plan for Water Sector Reform* and the main points of sector reform, which were to be enshrined in a new Water Law: establishment of an independent regulator, a national water company, and regional utilities. A memorandum of understanding (MoU) was signed between national and international stakeholders in 2012. In 2014, the *Water Law* mandating the reforms was approved, together with a *Water Sector Policy and Strategy 2012–2032*. In 2016, a three-year action plan for implementing the reforms (the *Water Sector Reform Plan 2016–2018*) was adopted, along with a *Water Sector Strategic Development Plan 2017–2022 (SDP)*. The SDP sets reform of the water and sanitation sector within the broader picture of overall water sector development and provides a sector investment program. All five documents are consistent about the nature and content of the reforms envisaged.

Four Core Institutional Changes

The reforms essentially consisted of four institutional changes:

Strengthening of sector planning and investment by building the capacity of PWA for water resources management and allocation, for planning and financing bulk water infrastructure, and for investment planning and programming within overall sector master plans. Public participation and public information were to be key characteristics of the planning process.

Separation of water resources management from water supply by transferring responsibility for bulk water sourcing and distribution from the West Bank Water Department (WBWD) (a PWA department) to a newly created National Water Company (NWC), which would be set up on a business-like basis similar to the Israeli water company, Mekorot. The role of the

Table 5.1: Guiding Principles for Water Sector Reform

Governance principles	Water supply	Sanitation	Water resources management (WRM)
Delineation of roles	Ring-fencing of revenues	Polluter pays	Aquifer/Basin management approach
Lean government (greater reliance on private sector)	Commercialization of subsector		Integrated water resource management (IWRM)
Equitable allocation of resource	Water – a social and economic good	Wastewater treatment and reuse	Encourage stakeholder participation in WRM
Appropriate planning and prioritized investment	Equitable access to safe and sustainable water services	Equitable access to services	Equitable allocation of resource
Separation of financing from implementation	Separation of tariff setting from revenue collection	Separation of tariff setting from revenue collection	Conservation and protection against contamination
Independent oversight	Full cost recovery	O&M cost recovery	
Robust data management systems	Demand management first, supply management second		
Cross-cutting principles			
Public access to information			
Public participation/Social responsibility			
Financial transparency and accountability (international standard)			
Sector sustainability			
Needs driven, not donor driven			
Rationalized with the Water Sector Plan			

Source: PWA 2012.
Note: O&M = operations and maintenance.

NWC would be to produce raw water both from natural sources and from desalination, to buy water from Israel, and to develop and manage national water carriers and distribution networks in both West Bank and Gaza.

Establishment of a sector regulator, the Water Sector Regulatory Council (WSRC), to regulate service provision in the interests of consumers and to separate tariff setting from revenue collection. WSRC's six main responsibilities (under Water Law Article 24) are: approval of prices of services and monitoring performance; licensing of service providers and ensuring compliance with licenses; development of performance incentive programs for service providers; setting of standards and monitoring of service provider performance; monitoring water supply agreements; and addressing complaints made against service providers.

Establishment of regional water utilities to provide equitable access to safe and sustainable water services for all in a business-like fashion with full cost recovery. The new institutions would operate under the Water Law and the jurisdiction of the Palestinian Water Authority (PWA)/ Water Sector Regulatory Council (WSRC). The utilities were to be established at a scale that could even out the current imbalances in water supply quantities and in tariffs. The new larger entities were also expected to realize efficiencies and economies of scale. Utility status would provide governance mechanisms for accountability of management to an independent board and for financial autonomy, ring-fenced finances, and accrual accounting following international standards. Public accountability and public participation mechanisms were to be introduced.

What Has Happened So Far?

The role of PWA has been redefined in the 2014 Water Law and the Authority has received considerable technical assistance and capacity building. PWA has produced comprehensive policy documents and strategies and plans for the short, medium, and long term. PWA has also oversee implementation of the reforms mandated by the Water Law.

WSRC has been established, but most of its statutory functions have not yet been legally transferred by PWA. WSRC's main activity to date has been data gathering and analysis, preparation of a framework of key performance indicators, and tariff studies. Up to now, the functions of regulation, tariff approval, and licensing of service providers have not been transferred to WSRC (and are not being carried out by any agency). For discussion of the reasons for the delay and of the way forward, see Chapter 6 (Section 6.1).

The NWC has not yet been set up. In March 2016, PWA published a draft action plan (PWA/Hydroconseil 2016) for setting up the NWC by a phased transformation of WBWD into the new company. However, no decision has yet been made about these recommendations. For discussion of the proposals for NWC and of the reasons for the delay, see Chapter 7 (Section 7.3).

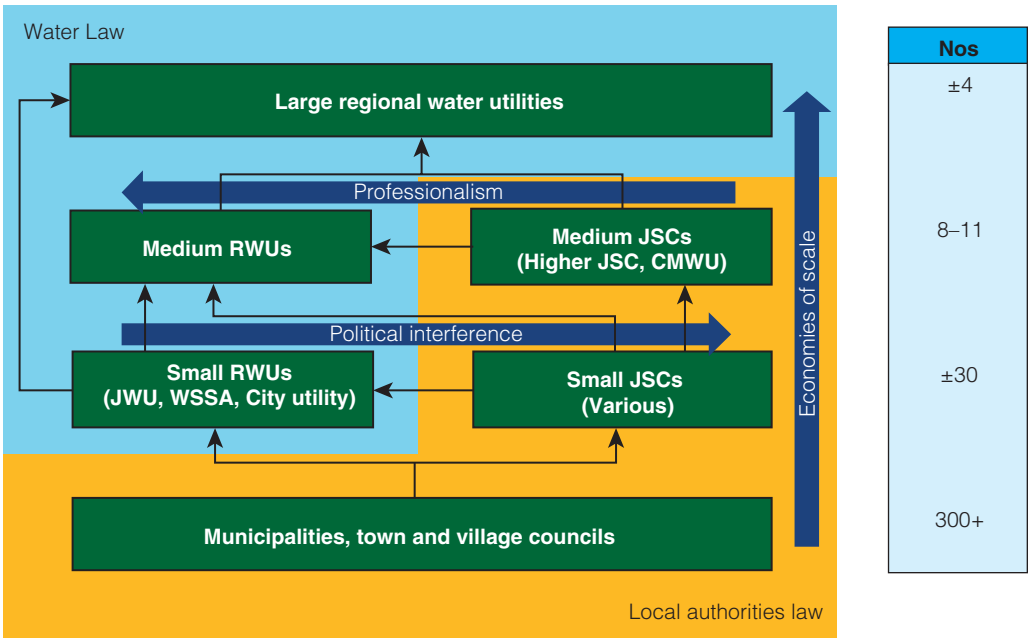
No new regional utility has been created. The two existing utilities (the Jerusalem Water Undertaking, JWU, and to a lesser extent, the Bethlehem Water Supply and Sanitation Authority) provide the potential nucleus of regional utilities in their area. JWU is already providing water to 200 villages in the environs of the 13 municipalities it also serves. In Gaza, the Coastal Municipalities Water Utility (CMWU) also represents such a nucleus. Working from the bottom up, a number of smaller local government units have come together in Joint Service Councils (JSCs), but their coverage so far remains limited. MoLG has developed a strategy to strengthen the role of Joint Service Councils to act as water service providers and has prepared standard instruments to improve water service management in local government units.

PWA's Proposal for Regional Utilities

PWA's proposal is for a progressive "aggregation" of service providers under the interim arrangement of Joint Service Councils, with gradual progression toward grouping them under regional utilities. In February 2017, PWA published a draft proposal for the progressive establishment of regional utilities through a twin process of expansion and absorption from the top and progressive clustering and expansion from the bottom. Proposals are to begin the restructuring of service providers and provision with the consolidation of municipal water departments and smaller providers into either smaller regional utilities (mandated by PWA) or Joint Service Councils mandated by MoLG (figure 5.1). The new organizations would be autonomous and financially self-sustaining and owned by the participating local government units. The medium-term objective would be to have about 30 of these smaller utilities or JSCs, which would progressively be merged into larger entities. The establishment of the large regional water utilities would be a longer-term goal.

Two pilots for the clustering exercise were proposed: in North Jenin and in Salfeet Governorate. For the time being, however, most service providers are still governed under the 1997 MoLG Law and the reform process has not yet begun to yield results, although there are efforts to encourage all service providers to strengthen transparency, accountability, and financial autonomy.

Figure 5.1: Proposed Restructuring of Provision of Water Supply and Sanitation Services



Source: PWA/Orgut 2017.
Note: CWMU = Coastal Municipalities Water Utility; JSC = Joint Service Council; JWU = Jerusalem Water Undertaking; RWU = Regional Water Utilities; WSSA = Water Supply and Sanitation Authority.

Completing the Reforms

According to PWA's Strategic Development Plan (SDP), the bulk of the reforms will be completed by 2022. The target is to have PWA and WSRC fully staffed and functional; to establish the NWC and the proposed regional utilities; and for at least 60 percent of the West Bank population and 90 percent of the Gaza population to be served by JSCs or utilities operating as autonomous service providers.

The Water Sector Reform Plan 2016–2018 provides a blueprint and timetable for further reform actions. It outlines a cooperative approach ("inclusive, solution-oriented, open, responsive and focused") to implement a three-year segment (2016–18) of the reform program. The Reform Coordination Unit in PWA is to work with the Reform Plan Task Team on implementation and monitoring of progress. The Task Team comprises representatives from PWA, the Ministry of Agriculture (MOA), the Ministry of Local Government (MOLG), the Ministry of Health (MOH), the Environmental Quality Authority (EQA), and WSRC. It is to publish quarterly and semi-annual reports, and update the Reform Plan on an annual basis. There are to be regular consultations with stakeholders, notably donors. Twelve specific targets have been set for 2016–18 (see box 5.1).

Constraints to Completing the Reforms and Improving Service Delivery

It is now almost two decades since the problems outlined in Chapter 4 were first identified and it is almost a decade since the Palestinian Authority decided on a reform program. The reforms are underway but clearly this restructuring will take considerable time and effort and must

Box 5.1: Targets and Indicators for the Reform Process, 2016–18

The Water Sector Reform Plan 2016–2018 has 12 specific targets:

1. Planning and monitoring of the reform process is organized in a timely manner.
2. Decision making and operations are informed through improved planning, monitoring, and reporting practices in the sector.
3. Capacities of PWA are established to fulfil its new mandate.
4. Capacity development of sector institutions is effectively coordinated and organized according to needs.
5. Strategies, policies, plans, and by-laws are established to guide and support the implementation of the 2014 Water Law.
6. Capacities of WSRC are established to fulfil its mandate.
7. Procedures, processes, guidelines, standard operating procedures, and benchmarking systems for performance monitoring of service providers are developed and their application is supported.
8. The process to establish and operationalize the National Water Company is agreed and being implemented.
9. Preparations are made to establish new regional water utilities on a pilot project basis.
10. Water and wastewater service provision are ensured and supported during the transition period until regional water utilities are established.
11. Agricultural water use is managed according to the new Water Law.
12. A basic legal framework and strategies to protect water resources from pollution are agreed.

Indicators have been formulated for these targets to guide the implementation of the sector reform over the coming years in the strategic development plan of 2017–22 and to monitor and report on the progress of the sector reform. Responsibilities have been assigned for each indicator to ensure that they are effectively achieved and adequately coordinated in line with the provisions of the Water Law.

Source: Water Sector Reform Plan 2016–2018.

overcome constraints. Part 3 of this report examines the root causes of the current situation by analyzing a series of binding constraints: institutional constraints; water constraints; and investment, planning, and financing constraints. Part 4 reviews options for relieving the constraints.

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Part 3

Constraints to Improved Service Delivery Outcomes

Site Survey for North Gaza Random Lakes, Gaza

World Bank.

Part 3 looks in detail at four key constraints to improving service delivery outcomes: institutional constraints (Chapter 6); the challenge of securing additional bulk water (Chapter 7); issues of planning, investment, and financing (Chapter 8); and the political economy of issues arising from the Israeli/Palestinian situation and from internal politics within the Palestinian territories (Chapter 9).

Chapter 6
Institutional and Financial Constraints to Improved Service Delivery Outcomes (Constraints to the First "I" of IWII)

The water sector is suffering from institutional challenges and unclarity of roles and responsibilities (see table 6.1). Although the water law of 2014 identified new water sector structure and highlighted roles and responsibilities, there is ambiguity between different institutions because the structure to strengthen regulatory functions and establish the regional service providers and the national bulk supply company has yet to be built.

Table 6.1: Relaxing Institutional and Financial Constraints

The problem	The causes	Current solutions	This Diagnostic's recommendations
Water services are embedded in local government not in the water sector, hence: • Accountability between PWA/WSRC and the service providers (SPs) is weak. • Local government units (LGUs) use water resources as a source of finance. • LGUs do not pay their bulk water bills (the net lending problem). • SPs are sqeezed by high levels of non-revenue water and low collection rates.	• MoLG/LGUs have no incentive to make water services autonomous or their accounts transparent. • For lack of an alternative plan for municipal finances, MoLG/PA turn a blind eye to the net lending issue, creating perverse incentives and an inequitable pattern of subsidy. • SPs lack the means and the incentives to improve their performance.	• Encourage establishment of autonomous SPs. • Consolidate water services under larger regional utilities with economies of scale.	A time-bound, incremental action plan to: • Set out alternative pathways toward improved service provision and corporatization. • Provide (revenue-neutral) incentives and investment to LGUs/SPs that are willing to move toward autonomous status. • Activate the full power of WSRC and bring SPs fully under the regulatory umbrella of the water sector. • Thoroughly analyze the net lending challenge and promote municipal finance reform.

Source: WASH-PD team.
Note: LGU = local government unit; MoLG = Ministry of Local Government; PWA = Palestine Water Authority; SPs = service providers; WSRC = Water Sector Regulatory Council.

Institutional Constraints

Slow Progress on the Agreed Sector Reforms, and Conflicting Incentives among the Three Central Agencies

The delay in transfer of functions to the Water Sector Regulatory Council (WSRC) has reduced the overall effectiveness of sector governance. Although the Palestinian Water Authority (PWA) has issued some directives, such as tariff guidelines, the Council is not yet fully mandated to carry out its functions (see Section 5.2). PWA still needs to issue the by-laws to implement the provisions of the Water Law, including those governing WSRC's licensing and tariff approval responsibilities. According to PWA,[1] powers to license and regulate service providers will be transferred to WSRC only when the proposed regional utilities are established. However, these risks leaving a lengthy period where there is effectively no sector regulation. At present, the functions of regulation, tariff approval, and licensing of service providers are not being carried out by any agency. A timetable for WSRC to take over its assigned functions and a plan for regulation during the transition period are needed.

Though Local Government Units (LGUs) provide a significant share of water services, they are not part of the sector governance framework at present. Although the Ministry of Local Government (MoLG) exercises administrative supervision of LGUs under the Local Government Law, water service delivery is only loosely supervised. This supervision is neither part of MoLG's mandate nor is it technically equipped to carry out the task. Since PWA (or WSRC) does not have any technical or administrative control over LGUs, there is a governance gap in the sector. Most service providers are currently unregulated.

At a higher level, there are no formal platforms for institutional coordination between PWA and MoLG and the service providers over bulk water allocation or investment. Improved mechanisms for institutional coordination between PWA and MoLG would make it easier for service providers to access water and investment financing. There is a disconnect, particularly over bulk water allocation and investment programming and financing. Plans prepared with stakeholder coordination and involvement rather than from the top down would better reflect local needs and reflect citizens' preferences. The disconnect over bulk water planning is clear from the problems the large town of Yatta is having in accessing water (see Chapter 4, Section 4.3). LGUs do prepare local investment programs (the Strategic Development and Investment Plans, SDIPs) that include requests for water investments, but MoLG is not able to provide much financing for these programs and there is no platform to link SDIPs to the much greater capacity of the Palestinian Water Authority to leverage financing for water sector investments.

Objectives between PWA and MoLG that are not always consistent have contributed to poor public policy outcomes; this tension is exacerbated by the inadequacy of municipal financing. There is a potential conflict between the goal of efficient and sustainable provision of water services (an objective of PWA and WSRC) and the goal of LGU administration (an objective of MoLG). In practice, this conflict has allowed one important public policy issue to remain unresolved: MoLG has turned a blind eye to the accumulation of LGU debt to WBWD as a means of financing municipal deficits – the "net lending" issue.[2]

The problem is that there is no functional intergovernmental fiscal transfer system that allows the central government to finance local government budgets: that is, there is no equalization grant provided by the Ministry of Finance and Planning (MoFP) that takes into account population, need, and the fiscal capacity of LGUs.[3] LGUs on average raise only about 10 percent of their own revenue. For the rest, they rely on transfers from the central government or from donors.[4] Without some sort of alternative financing through a property tax or other taxes that can generate local revenue, many LGUs rely on revenues from water services to help cover the general expenditures of the LGU that are not specific to water. This deprives the water operation of needed finances and has led many LGUs to simply not pay WBWD for bulk water.

This is plainly a bad piece of public policy for the water sector – and for West Bank and Gaza as a whole.

The same divergence between PWA and MoLG visons may complicate the implementation of sector restructuring. Although both PWA and MoLG share the objective of efficient, sustainable, and equitable service provision and despite the government's decision to restructure the sector, which is enshrined in the 2014 Water Law, there may be fewer incentives for MoLG (and for LGUs) to support implementation. MoLG and the LGUs may see in this transfer of responsibility for local service provision a loss of power, a loss of access to resources, and a loss of status in the eyes of the local electorate. They may see the move as a "centralization" counter to the process of decentralization that the Palestinian Authority (PA) has consistently pursued. They may fear that moving responsibility and accountability to a higher level will weaken the bond with the citizenry and lead to a deterioration in services.[5] Sector reform requires that interests be reconciled. The central issue here is again the absence of a sustainable system of municipal financing. As long as LGUs are obliged to divert water revenues to finance other operations, they – and their parent ministry – will have little incentive to give up control over these revenues to an autonomous utility. MoFP, MoLG, PWA, and WSRC need to work together to find incentives that will encourage LGUs and the MoLG to accept separation of the finances of water service provision from financing of LGU operations.

Citizen engagement in the planning process is limited. The overly centralized and top-down approach to management of water sector issues is also reflected in the weak engagement with citizens. There is, for example, very little consultation with citizens in decisions relating to sector investments by PWA. As discussed, public participation may get water investment added to the SDIPs, but these plans do not necessarily turn into sector investments.

Nonetheless, citizens are key stakeholders and need to be actively engaged on water service delivery issues – and on sector reform. Sector reform will progressively take service provision responsibilities away from the LGU/MoLG nexus and bring it in new institutional forms under the water sector (PWA/WSRC). This will have considerable impact on consumers, both positively – in terms of more efficient, reliable service provision – but also negatively in terms of more vigorous cost recovery and potentially higher tariffs. It is necessary to engage citizens in debate on these issues and to demonstrate that the reforms will be to their advantage in terms of improved and affordable services.

The Need to Establish Better Accountability

The slow pace of sector restructuring leaves most service providers without clear accountability to central agencies. The current division of responsibilities among PWA, WSRC, and MoLG presents some challenges for oversight of local government service providers. The "governance gap" between PWA, WSRC, and MoLG (see Section 6.1) means that service providers have very confused upward accountability. At present, they may look either to PWA or MoLG for investment finance. They look to PWA for water resources, but without any formal accountability. They may look to either PWA, WSRC, or MoLG for operational and financial guidance. They may look either to PWA or to WSRC for guidance on tariffs. They may be in some sense accountable to all three – but essentially having three oversight bodies means for many service providers having no oversight at all.

Accountabilities between PWA and the service providers are not clear. As local government entities reporting to MoLG, local government water departments have no direct accountability relationship with PWA. On one hand, PWA is not formally accountable to the service providers for water allocation or supply or for investment. On the other hand, unless the Water Law is fully implemented and service providers are committed and held responsible to adhere to the conditions of their license, they are not accountable for what they do with this precious and scarce national resource. There is, for example, no sanction for inefficient service providers with high levels of water losses.[6] This has some practical repercussions in such areas as water

allocation and investment. The autonomous providers – Joint Service Councils and the two utilities – do not have an accountability relationship with PWA either, although their separate accounting and governance structure at least allows for transparency.[7]

These diffuse and weak accountabilities between PWA and the service providers affect water resources allocation and payment. Lacking a direct dialogue with PWA, service providers may find it hard to grasp the challenge of water resource allocation – again see the case of Yatta described in Chapter 4 (Section 4.4). The absence of direct accountability relations makes it hard for service providers to communicate their needs and problems to PWA and to plan operations. This lack of direct lines of communication could lead to an adversarial attitude between service providers ("they are neglecting us") and PWA ("they are wasting our precious water"). Service providers also have weak incentives to cooperate with MoFP, PWA, and WBWD or the Coastal Municipalities Water Utility (CWMU) on payment for purchased water.

Lack of accountability between PWA and the service providers also makes it hard to construct and implement realistic investment plans. Both PWA and MoLG have responsibility for investment in water supply and sanitation. MoLG is, however, a small player, and it is PWA that is responsible for arranging most of investment in water supply and sanitation.[8] Currently, the PWA investment program contains a large number of projects for a number of service providers (see Chapter 8), but lack of a direct accountability relationship between PWA and the local government entities makes it hard for PWA and service providers to work together to ensure the program is realistic, prioritized, financed, and implemented. These challenges of accountability reinforce the logic of bringing service providers within the fold of the water sector as provided under the Water Law.

The Lack of Accountability and Incentives for Good Performance in Local Government Water Departments

Supervision of local government water operations is limited; thus, local government entities have a high degree of latitude on how to run the service. Because accountability chains and oversight arrangements from the center with respect to water service provision are quite frail (as discussed), each LGU enjoys a high degree of autonomy on how to organize and run its delivery of water services. There is recourse to PWA for water and investment, and MoLG and WSRC provide some limited supervision (MoLG has a small department that supports LGU service provision, and WSRC collects performance data and may advise on tariffs). But apart from those linkages, LGUs have a high degree of latitude in how they govern their water operations – whether they choose to use water revenues for other purposes, for example, or prioritize other LGU functions over investment in water services. This has often resulted in the diversion of water revenues to cover general municipal expenditures, leaving inadequate resources for municipal water departments to meet their capital and operating expenditure requirements.[9]

For all service providers embedded within local government, there are issues of accountability, compact, voice, and client power. [10] In most municipalities, there is a water department that reports either directly to the Council or through a manager and/or a mayor. In general, this presents a strength and a weakness. The strength is that there is in principle a democratic accountability chain because the water operation is accountable to the Council, which is accountable to its electorate.[11] The weakness is that municipal councils have several competing priorities. They may not prioritize water services or they may see water services as a useful source of revenues. Because they are not set up as a legally established board of a utility, they may provide only weak direction and oversight or monitoring of performance. Governance is not aligned with a viable business model under which efficient service delivery is monitored and the operation is expected to be financially self-sustaining. The water operation accounts are often mixed up with other activities, so that funds are not ring-fenced. The water operation may be treated as a cash cow or tariffs may be set too low.

Beyond the institutional form of a service provider and its degree of autonomy and accountability, other factors affect the performance of service providers. In practice, service providers

embedded within local government may overcome institutional constraints and can outperform providers with higher degrees of autonomy. For example, among larger service providers in the WSRC classification (Group A, more than 8,000 connections), several municipal water departments (including those in Hebron, Jericho, and Salfeet) outperform the two utilities (the Jerusalem Water Undertaking, JWU, and the Water Supply and Sanitation Authority, WSSA) on controlling non-revenue water. Several municipal departments outperform some JSCs on collection efficiency. Clearly on the trajectory to sector reform, there is much to be learned from the variation in service provision between municipal water departments, JSCs, and utilities. As discussed in Chapter 4 (Section 4.3), many factors influence service delivery performance, including the amount of bulk water available; the level of investment and the state of the network; local politics; local topography; and the costs of bulk water.[12]

The incentive structure for improved institutional performance is weak. The centralized and top-down structure of organization in the sector has resulted in all sector decisions (including strategic, operational, and investment decisions) being taken by PWA, with very little role for service providers. Though WSRC has developed a performance monitoring framework, this does not cover all aspects of service provider performance and is not linked to decisions on resource allocation. The financing model in the sector, with its emphasis on input-based financing of specific projects and the absence of any linkage between investments and service delivery performance, also does not offer incentives to service providers to improve their institutional performance.

Mutual accountability between service providers and consumers is not assured. Main indicators of accountability between service providers and consumers are the number of complaints and the willingness of consumers to pay for the service. Since 2015, WSRC have been monitoring complaints in West Bank. In 2015, WSRC data show an average of one complaint per four customers, with the vast majority of complaints concerning poor continuity of service, followed by billing complaints. Some providers, however, registered more than one complaint per consumer (Tulkarem, 1.4 complaints per consumer; Beit Ummar, 2.0 complaints per consumer). This pattern is consistent with the findings of the Local Governance Performance Assessment (LGPA) (see Chapter 3), where more than half of West Bank respondents reported no key problems with their water supply, but more than one-quarter raised problems of discontinuity and pressure. Willingness to pay is a proxy for satisfaction with the service and for a relation of accountability between service provider and consumer. The very low willingness to pay in Gaza is an indication of a breakdown in mutual accountability. According to the LGPA, 43 percent of consumers in Gaza do not pay for water at all.

Some progress has been made with initiatives to introduce local participatory planning, but these initiatives need to be accompanied by strengthened decentralization and enhanced local autonomy and empowerment – and linked in to investment programming and finance. The initiative of participatory planning through preparation of Strategic Development and Investment Plans (SDIPs) has provided only a limited opportunity to strengthen local participation in the planning process. Though the preparation of SDIPs is increasingly institutionalized, competing municipal priorities make it difficult for water supply and sanitation service delivery issues to get priority in SDIPs and turn into investments. A recent assessment (Romeo 2017) found that the initiative needs to be accompanied by dedicated financing and an integrated multiyear approach facilitated by empowerment of citizen participants. Otherwise, the SDIP can provide only a weak platform for citizen engagement, which risks degenerating into a shopping list aimed at donors.

Overall, local governance arrangements do not always provide the framework and incentives for service providers to perform well. Although there is wide variation in performance and many water departments are striving to do a good job, they are all constrained by a weak governance framework. Accountability for municipal service provision between the water department, the municipal council, and consumers is low, and this reduces incentives to do the right thing. Councils that can "'put their hand in the water till" with impunity undermine incentives both for the water department to maximize revenues and for consumers to pay. Water departments that are not supervised, supported, and rewarded or sanctioned on the basis of performance lack

incentives to improve. Consumers who see poor quality service and diversion of water revenues lose faith in their service provider. Overall in West Bank and Gaza, 30 percent of consumers pay late or do not pay at all (see the data from the LGPA in Chapter 3).

Removing Impediments to Sector Reforms

Flexibility and responsiveness to local conditions should be the watchword in moving ahead with sector reform. Sector reform is based on the assessment that much of the current variable, and sometimes poor, performance in water supply and sanitation can be attributed to the plethora of service providers and to conflicting or absent governance patterns. The agreed restructuring thus assumes that aggregation via a utility or JSC model and ultimate inclusion under regional water utilities will strengthen governance and accountability and generate economies of scale and thereby improve service provision. The analysis in Sections 6.2 and 6.3 confirms challenges of accountability and incentives, although evidence from service provision does not confirm that any one institutional form is necessarily better than others. Service providers can succeed in delivering good services if they have the right combination of local (even informal) governance and consumer confidence, incentives to good performance and management, adequate water supplies, and investment. This is not to say that the agreed reforms are not the right ones – just that there may be several pathways to reaching the final goal.

Accountability relationships need to be clarified among service providers, PWA, and WSRC. Service providers need to be brought under PWA and WSRC jurisdiction, as envisioned by the Water Law, with full regulatory responsibilities transferred to WSRC, and arrangements implemented to bring service providers under WSRC for regulation and PWA for planning and investment.

The challenge here will be to ensure accountability relationships to bridge the gap between the de jure and the de facto sector organization during the transition period, which is likely to be lengthy. The Water Law provides only for relationships under the reformed structure of regional water utilities under PWA/WSRC jurisdiction and does not provide de jure for a situation where much service provision will remain the responsibility of LGUs or JSCs under MoLG jurisdiction for an extended period. A key question will therefore be to ensure adequate arrangements during the transition period for regulation, bulk water planning, and investment planning and financing.

Accompanying these changes, a proper financing mechanism for water and sanitation operations needs to be developed. The 1997 MoLG Law allocated multiple functions to the LGUs without proper financing mechanisms or fiscal decentralization. Essentially, LGUs have been left to find makeshift ways to finance services, taking revenues from one service to finance other services or general operating budgets. This has led to finances being diverted from water operations, which also lack clear mechanisms to access investment finance. Sector reform must therefore go beyond adjustments in accountability relationships to put in place a predictable financing mechanism for water services, both recurrent and investment. This arrangement needs to link top-down planning and financing mechanisms to local planning for capital investments for water supply and sanitation services, with engagement of municipal governments and citizens. It also requires the PA to address the much broader question of how municipalities are to be financed.

Piloting of aggregation under the small utility or JSC model needs to be monitored. PWA is proposing progressive clustering of municipal service providers via either a small utility model or the JSC model in a progression toward the regional utility model (see Chapter 5). Pilots in two areas will demonstrate to what extent small utility or JSC status can be a stepping stone as services are progressively aggregated under the proposed Regional Water Utilities (RWUs) (see Section 5.4). With the right incentives and support, one or other of these two models may, if the respective pilots are successful, subsequently be applied more widely – for example, to restructure municipal water departments – on the path toward creating larger utilities with more economies of scale.

It will be important to get stakeholders on board, listening to their concerns and reconciling them with the reforms – and to pay attention to the needs of the poor. As the 2004 World

Development Report on *Making Services Work for Poor People* asked, "How can the role of clients in revealing demand and monitoring providers be strengthened? By increasing poor people's choice and participation in service delivery. When clients are given a choice among service providers, they reveal their demand by 'voting with their feet.'"[13] Global experience shows that in difficult water supply situations it is important to engage stakeholders, including citizens, to understand problems and contribute solutions. It would be beneficial for service providers to improve communications with stakeholders and open up debate locally about ways to improve services during the transition period. At a regional and national level, it is a natural role for PWA as sector leader to lead the dialogue with MoFP and MoLG to address constraints and identify solutions to improve service delivery, and to develop a platform that would include citizens. PWA needs to reconcile interests and demonstrate that scaling up service provision and bringing it under the water sector will be to the advantage of all stakeholders: public agencies, local government, service providers, and all consumers. It will be particularly important to attend to the needs of the poor.

Incentives for improving institutional performance and accountability need to be built in. The ongoing sector reform should ensure that service providers are incentivized to improve their performance and accountability to their customers and stakeholders. Regular monitoring of institutional performance and the rewarding of superior performance needs to be institutionalized. Providing transparent and predictable financing to service providers and linking this financing to service delivery performance may be considered as an incentive. Improving accountability of service providers to citizens and stakeholders through robust citizen engagement, especially in the planning and implementation of investments, needs to be put into practice. Enhanced transparency of institutional performance and sector financing through the sharing of data with citizens can enhance the accountability of sector institutions.

Need for a Strong Lead, Technical and Financial Support, and a More Inclusive Approach to Restructuring the Sector

PWA has a major mission in leading sector reform and needs strengthening to carry it out. The progressive restructuring of service provision is being led with energy and skill by PWA, but the role is demanding not only technically but also in terms of the political economy (see Chapter 9). Because restructuring inevitably creates uncertainty, it is up to PWA to work with other government agencies to reconcile interests among government agencies, with local government, and with service providers. On issues that affect municipal finances like net lending, close cooperation between MoLG, the Ministry of Finance and Planning (MoFP), and PWA will be essential. PWA needs to have the capacity and resources to carry out the dialogue that can align interests and demonstrate that scaling up service provision and bringing it under the water sector will be advantageous to all. As leader of the reforms on behalf of government, PWA is also accountable to the public and will have to demonstrate that the reforms will benefit the people of West Bank and Gaza. PWA will need further strengthening to play these roles and to ensure that donors remain aligned behind the reforms during the restructuring process.

A differentiated approach that distinguishes among the various types of water service providers may be useful in the short term. The various types of service providers currently within the sector will not be able to all move at the same pace and in the same way on the path to reform because of existing governance gaps and institutional and capacity weaknesses. For example, transforming the two existing utilities to form the core of regional utilities may require only a few steps, but for the same to happen with municipal water departments would require much more dialogue, organizational redesign, and support to build capacity. Thus, while the institutional reform of existing utilities could focus on strengthening their corporate governance framework, the focus on municipal water departments could start with introducing basic financial management principles such as separating the revenues and expenditures relating to water service delivery from the municipal budget and introducing more robust financial reporting.[14] Hence the sector reform plan may be adapted during implementation

to embrace a differentiated approach that would enable the smooth and time-bound implementation of the institutional reforms.

Financial Constraints

Perverse Incentives at Both the Service Provider and Consumer Level in West Bank

At the bulk level, municipal water departments benefit from two levels of transfer. There are direct transfers because the West Bank Water Department (WBWD) bills water to service providers at 20 percent below cost. There are also indirect transfers because many municipalities do not pay WBWD for the water. In 2014, the underpricing by WBWD and nonpayment by municipalities provided an effective transfer of NIS130 million ($35 million) to service providers, mainly the municipal water departments (box 6.1). This "subsidy" goes disproportionately to the service providers that are the worst payers, rewarding the worst performers.

Box 6.1: Calculation of Net Lending in West Bank's Water Supply

Service providers paid the West Bank Water Department (WBWD) only one-third of the cost of the water supplied to them, on average, in 2014, the latest year for which data are available. This effective transfer of two- thirds (65 percent) of WBWD's cost of sales was made up of 15 percent underpricing by WBWD and 50 percent nonpayment of WBWD bills by the service providers (see table B6.1.1). The total transfer – and cash cost to the public – in 2014 was NIS131 million ($35 million).

The transfer is unevenly distributed, going disproportionally to the service providers that pay the lowest share of their bills. This transfer allows service providers with low or negative margins (working ratios greater than 1) to have a positive cash flow, even with low collection efficiency from consumers. The calculated transfer of NIS131 million for 2014 was roughly consistent with the NIS110 million increase in the amount due to WBWD from the service providers in 2013–14 (table B6.1.2).

Table B6.1.1: Net Transfer to Service Providers from the West Bank Water Department, 2014

	NIS per m^3	Total volume	NIS million	% of cost of water sold
1. Water billed by WBWD	2.60	66.2	172.0	–
2. Cost of water sold by WBWD	3.07	66.2	203.2	–
3. Difference: (2) – (1)	0.47	66.2	31.2	15%
4. Amount actually paid by the service providers to WBWD	1.09	66.2	72.0	–
5. Difference: The total transfer to service providers: (2) – (4)	1.98	–	131.2	65%

Source: PWA/Hydroconseil (2016).
Note: Net transfer to service providers = difference between the cost of WBWD sales revenue and what is paid by the service providers. m^3 = cubic meters; WBWD = West Bank Water Department.

box continues next page

Box 6.1: Continued

Table B6.1.2: Increase in West Bank Water Department Receivables from Service Providers

	NIS million
1. Receivables, 2013	900
2. Receivables, 2014	1,010
3. Increase in 2014: (2) – (1)	110

Source: PWA/Hydroconseil 2016.

At the retail level, the effective subsidies also reward mostly those who perform the worst rather than those who need it. Average retail tariffs in the West Bank cover costs, but the low average collection rate (68 percent) causes massive accounting losses for the service providers, while consumers benefit from an aggregate "subsidy" of one-third of the cost (box 6.2). Again, the incentives and rewards go to those who behave the worst – in this case, the consumers – but this consumer "subsidy" is unevenly distributed and inequitable. It goes mainly to those served by service providers with the lowest collection efficiency, such as Tulkarem, Qalqilya, Jenin, and Jericho – all of which collect little over half of amounts billed. Within a service area, the subsidy goes mainly not to the poor but to consumers with the biggest bills, and to consumers who assert entitlements as a class to not pay (including public agencies, refugee camps, and mosques).

The Ministry of Finance (MoFP) is now recovering arrears – or net lending – and this is already causing difficulties for municipalities. As discussed previously (in Section 1.5 and box 6.1), the web of hidden subsidies allows the service providers to run a net deficit of about NIS100 million ($35 million) per year, underwritten largely by the practice of net lending. MoFP is now recovering both current bills and arrears by deducting from transfers due to the municipalities. This is inevitably leading to a crisis in municipal finances – and will certainly squeeze water services further (see box 6.3).

These losses have been financed by the build-up of net lending. Because service providers do not pay their bills, WBWD cannot pay Mekorot for purchased water, so Israel deducts the amounts due from the taxes it collects on behalf of the Palestinian Authority (figure 6.1). However, these deductions made by Israel for unpaid Mekorot bills (net lending) are considerably higher than the calculations set out in box 6.1 based on data from WSRC and WBWD. In 2016, Israel deducted $70 million from revenues to the Palestinian Authority for unpaid bills to the Israeli bulk water supplier Mekorot – twice the apparent $35 million shortfall in payments by service providers for bulk water calculated in box 6.1. It is difficult to reconcile these figures without more information. In addition, Israel also deducted about $24 million from revenues in 2016 for untreated wastewater that they have received from West Bank. In 2016, Israel thus deducted a total of $94 million for unpaid water bills and for sewage treatment.[15]

Palestinian purchases from Mekorot are expected to rise rapidly and unless cost recovery improves, the net lending problem will worsen. PWA currently purchases 70 MCM of water per year from Israel. Negotiations are underway for purchase of up to another 30 MCM, and in addition there may be a further 34 MCM to be delivered under the Red-Dead accord, so that overall purchases may reach 135 MCM annually. Unless service providers can recover their costs from consumers and pay the full cost of bulk water, the net lending problem will

Box 6.2: Net Subsidy to West Bank Consumers

West Bank consumers on average paid only two-thirds of the cost of the water supplied to them in 2014, the latest year for which data are available (table B6.2.1). Service providers billed the full nominal cost of water (with a small margin). This effective subsidy of one-third (32 percent) of the cost to the service providers was thus made up almost entirely of nonpayment to service providers by subscribers.

This "effective consumer subsidy" would normally be financed by negative cash flow from the service provider. However, because the service provider is typically not paying the West Bank Water Department (WBWD) bill in this case, the "subsidy" to the consumer is being financed out of the transfer from the WBWD of NIS131 million that the service providers receive.

Because the subsidy to the consumer (NIS1.57/m^3) is less than the transfer from WBWD to the service providers (NIS1.98/m^3), there is a positive cash flow for the service provider that can either be retained in the water operation or used for other municipal purposes.

Table B6.2.1: Net Transfer to Consumers, 2014

	NIS per m^3	% of cost of water sold
1. Water billed	5.05	–
2. Cost of water sold	5.00	–
3. Difference: (2) – (1)	(0.05)	–
4. Amount actually paid by consumers to service providers	3.43	68%
5. Difference – the total "effective subsidy": (2) – (4)	1.57	32%

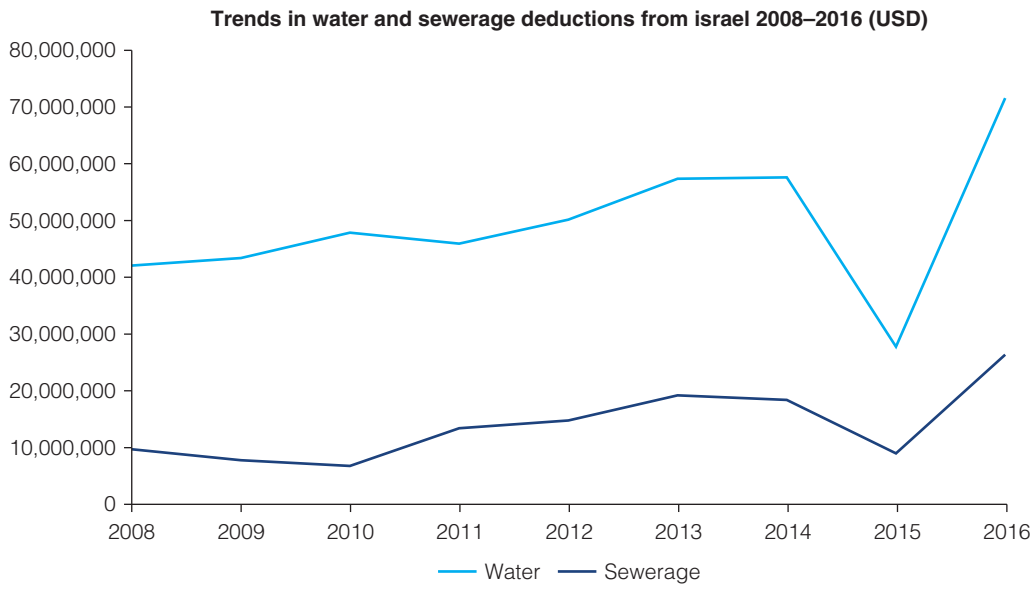
Source: WSRC.
Note: Net transfer to consumers = difference between the average cost of water sold by the service providers and what is paid by consumers. m^3 = cubic meters.

Box 6.3: Net Lending Arrears Are Returning to Haunt Yatta Municipality

Yatta municipality owes a total of NIS27 million ($7 million) in arrears. Its total annual municipal budget is about NIS15 million ($4 million). In 2016, the Ministry of Finance and Planning (MoFP) deducted NIS6.7 million ($1.8 million, 25 percent of arrears) from its transfers and is deducting NIS250,000 ($65,000) per quarter to pay current bills to the West Bank Water Department.

Source: Field visit to Yatta, December 4, 2016.

Figure 6.1: Trends in Water and Sewerage Deductions from Israel, 2008–16



Source: Palestinian Ministry of Finance and Planning.

only grow worse. In addition, it is likely that the deductions for untreated wastewater will continue until West Bank can capture, treat, and dispose of all its wastewater.

The Need to Help the Poor in West Bank, Particularly in Area C

There is scope to improve services to poorer areas, particularly Area C. As discussed in Chapter 3 (Section 3.3), costs of water service per capita are not currently very high in relation to incomes (averaging 1.7 percent of household budget), but account for slightly larger shares in the budgets of the poorest. However, costs are likely to rise (see discussion that follows) and service providers need to consider whether more pro-poor strategies will be needed. Service providers already apply block tariffs designed to cross-subsidize low-income consumers. However, this arrangement may not always be pro-poor where several poor households are connected to a single meter. Although Joint Service Councils (JSCs) and Village Councils (VCs) typically lack the ability of Municipal Water Departments to "subsidize" their service provision, they generally provide pro-poor cross-subsidies. The poor who are most at risk are those not connected to the network or who are in areas of poor water service. The most pro-poor strategy is to increase network coverage, particularly to Area C, and to improve water quantities and service delivery to poorer areas.

Procuring extra quantities of water and improving water service will drive up costs rapidly, especially because new supplies at the margin will be priced based on desalination costs. Production costs at the coast are now about NIS2.22/m^3 ($0.58/$m^3$), and the prices that the Israeli bulk water supplier, Mekorot, is expected to request for delivering extra water to the West Bank are expected to be higher than the current NIS3.20/m^3. In addition, service provider reform will be expected to ensure full cost recovery and high collection rates. Palestinians will therefore find the cost of water service increasing considerably. While this will leave costs within an acceptable range for many, it will certainly affect poorer segments.

High Water Loss and Low-Cost Recovery Squeeze Service Providers in Gaza

Service providers in Gaza lose two-fifths of the water and bill only 67 cents on the dollar – but only one person in three pays for their network water anyway. More than one-third of the scarce water pumped is not accounted for. Non-revenue water averages 38 percent and is as much as 50 percent in one governorate (North). Tariffs cover only two-thirds of costs, and service providers collect only 37 cents on each dollar of sales. One provider collects only 5 cents on the dollar, and the highest collection rate among all 25 service providers is 56 cents on the dollar.

The financial performance of Gaza service providers is among the worst in the world. The high level of non-revenue water, the low selling price, and dramatically low collection efficiency mean that the average service provider covers less than one-quarter (24 percent) of its costs. This dramatically low viability leaves service providers dependent on subsidies for both operations and investment, with little room for improving services and with no prospect of attracting private finance. Service providers finance their operations simply by not paying their bills.

Notes

1. Communication from PWA, June 2017.
2. "Net lending" refers to the deductions made by Israel from clearance revenues as a result of utility (mostly electricity, but also bulk water) bills that have not been paid by Palestinian municipal water departments. These deductions from Palestinian Authority (PA) tax revenues amount to a de facto fiscal transfer to Palestinian municipal governments. For discussion of this issue, see Section 6.6.
3. See the analysis of municipal financing issues in the Public Expenditure Review (PER) (Niksic and Nasser Eddin 2016).
4. There is no functioning intergovernmental fiscal transfer system for LGUs. Some 95 percent of LGU financing comes from budget allocations from the PA (for capital and recurrent expenses) and through donor financing. Even though the PA is supposed to pass down a share of the transportation fee collections, that has not happened due to fiscal constraints in the PA budget.
5. These factors appear to be behind the reluctance of Gaza municipalities to pool their resources in the Coastal Municipalities Water Utility (CMWU), and were also factors mentioned in interviews with key informants in December 2016.
6. Under the Water Law, service providers are obliged to be registered and issued with a license by WSRC. Article 60 of the Water Law would then allow WSRC to impose penalties on service providers that do not respect the terms of their license. This could include, for example, penalties for high levels of water losses. However, the by-law empowering WSRC to issue licenses and impose penalties has not yet been issued.
7. In the future, WSRC will be responsible for regulation, but this role has not yet been initiated (see Sections 5.2, 5.3, and 6.1).
8. According to the Water Law (Article 8.6), PWA is responsible for planning, evaluation, and monitoring of implementation of water and wastewater projects. Coordination of investment finance is not mentioned, but in practice has devolved on PWA.
9. The same has been true for electricity revenues.
10. Figure 1.1 in Chapter 1 illustrates how such bodies are in theory the least autonomous entities in the sector.
11. However, elections have not been held at the local level for a considerable time, which undermines the electorate's ability to hold local officials accountable.
12. Jenin Municipality, for example, reports 22 percent non-revenue water, which is lower than JWU (27 percent) and much lower than WSSA (41 percent). Collection efficiency for medium-size service providers (Group B, 2,000–8,000 connections) also varies widely.

Arraba, Halhul, Salfeet, Ya'bad, Beitounia, and Biddya municipalities all report collection efficiencies over 90 percent, whereas the JSCs for Jenin, Tubas, and Maythalon report collection efficiencies between 64 percent and 89 percent.

13. World Bank (2004, 9).
14. For details on improvements that may be made in financial management and accounting, see Chapter 8.
15. These figures come from the Palestinian Ministry of Finance and Planning. As of the time this Diagnostic was written, the authors did not have the formulas used to calculate the deductions.

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Chapter 7
Constraints to Securing Additional Bulk Water (Constraints to the "W" of IWII)

West Bank

The Growing Bulk Water Problem in West Bank

Water supply quantities in the West Bank are below target levels. The bulk water challenge for West Bank was set out in Chapter 1 (Section 1.7). In summary, against a target set by the Palestinian Water Authority (PWA) of 120–150 liters per capita per day (lcd), current bulk water provided for municipal and industrial (M&I) uses in West Bank is about 96 (lcd), while the actual supply is about 80 liters per capita per day. In addition, there is wide variation between locations, with extremely low supply in some towns. Infrastructure for bulk water supply is fragmented and linked piecemeal with the Mekorot network.

The challenges are how to access increased supplies of bulk water to meet growing demand, and how to improve distribution and management of scarce water. Internal water resources are inadequate to meet demand. Per capita *internal* resources within West Bank for domestic water supply have shrunk considerably—to just 40 liters per capita per day. Thus, there is a structural deficit and growing dependence on water purchases from Israel (Section 1.7).

Constraints to PWA's Plans to Develop New Resources and Buy More Water from Israel

PWA's Strategic Development Plan for water resources development and more purchases from Israel faces natural resource, political, and economic constraints. PWA is responsible for water resources development, allocation, and regulation. In line with these responsibilities, PWA projects future supply and demand, allocates water between sectors, programs investment for water resources development, negotiates project approvals with Israel in the Joint Water Committee, arranges donor financing, and arranges for project implementation. PWA's Strategic Development Plan (SDP) targets high levels of water resources development and increased purchases from Israel, but so far little progress has been made in implementing the planned steps. First and foremost is the problem of accessing enough water to serve both municipal and industrial (M&I) and agricultural needs. Internal water resources are very limited and access to them is heavily circumscribed by the constraints imposed by Article 40 of the Oslo Accords, the Joint Water Committee, and movement and access restrictions (see Chapter 9). Beyond these natural and political constraints (see table 7.1), PWA is faced with the economic constraint of the high cost and technical difficulty of developing new conventional and nonconventional resources (essentially desalination and wastewater reuse). The only other alternative is water purchase from Israel, which inevitably raises a whole range of issues and constraints. Water resources discussions with Israel tend to form part of a wider dialogue about rights and statehood and hence PWA is constrained by a series of political economy

Table 7.1: Relaxing Bulk Water Constraints

The problem	The causes	Current solutions	This Diagnostic's recommendations
West Bank			
• Internal resources are insufficient and dwindling. • Half of internal resources are allocated to agriculture. • Internal resources are distributed unequally. • Wastewater treatment (WWT) or reuse is scant.	• Article 40 and movement and access (M&A) restrictions. • Need to keep agriculture and Area C viable. • Wastewater solutions are very costly and constrained by Area C restrictions.	• Revive JWC. • Negotiate further water purchase. • Transform WBWD into NWC over time. • Integrate WWT and reuse.	• Make planning for supply and demand more realistic, rather than aspirational. • Engage in dialogue on overall water security. • Set up NWC now. • Integrate WWT and reuse.
Gaza			
• Water quality is undrinkable. • Overdraft and depletion is unstoppable • Wastewater is treated but not reused.	• Internal political situation; PWA loss of control. • Wastewater reuse solutions are high cost, lower priority, and heavily constrained by M&A restrictions.	• Desalination. • Wastewater reuse.	• Decide on desalination and purchases. • Set up NWC now. • Support and regulate private service provision. • Support medium-scale desalination. • Promote wastewater reuse.

Source: WASH-PD team.
Note: JWC = Joint Water Council; JWU = Jerusalem Water Undertaking; NWC = National Water Company; WBWD = West Bank Water Department; WWT = wastewater treatment.

issues (Chapter 9). Finally, West Bank and Gaza lack the level of investment resources and household incomes that have enabled Israel to solve similar water problems. Israel has one of the best performing systems in the world, but it is very costly.

The history of the last 20 years demonstrates these challenging conditions. PWA has not been able to develop even all the water resources agreed under Article 40 (box 7.1). Dependence on water purchased from Israel has increased. PWA has not been able to regulate groundwater extraction, and water allocations to municipal and industrial (M&I) uses have become increasingly inadequate as demand has gone up much faster than supply. PWA's plans for water resources development respond to aspirations and to need rather than to feasibility, and are inevitably more statements about recovering control over natural resources that Palestinians consider their own than practical planning.

Renewed engagement with Israel may bring movement on infrastructure approvals and water purchases. The Palestinian Authority (PA) has recently re-engaged with Israel in the Joint Water Committee (JWC) and there may be movement on both infrastructure and water from renewed cooperation and from the Red-Dead project agreements. Negotiations are underway for an extra 30 million cubic meters (MCM) purchase from Israel and possibly a further 34 MCM under the Red-Dead agreement. PWA is planning for the necessary infrastructure to distribute the water equitably. However, the terms of the purchase of water are not yet clear, and it may prove expensive.

Box 7.1: Water Allocations under Article 40 of the Oslo II Accords

About one-fifth of the total resources from the three shared aquifers covered in the 1995 Oslo II Accords was allocated to the Palestinian Authority (PA). Specifically, of the total "estimated potential" of the three aquifers, 483 million cubic meters (MCM) was allocated to Israel (71 percent) and 138 MCM was allocated to the PA (20 percent). Of the Palestinian share, 20.5 MCM was to come from "additional wells" yet to be developed. The balance of 57 MCM was left "to be developed" from the Eastern Aquifer (see table B7.1.1).

Table B7.1.1: West Bank: Allocation of Water Resources of the Three Shared Aquifers under Article 40 (MCM)

	Article 40 allocation				
Aquifer	"Estimated potential"	Total Palestinian	Total Israeli	Unallocated	Total
Western	362.0	22.0	340.0	–	362.0
North Eastern	145.0	42.0	103.0	–	145.0
Eastern	172.0	54.0	40.0	–	94.0
Eastern (additional wells)	–	20.5	–	–	20.5
Eastern (unallocated)	–	–	–	57.5	57.5
Total	**679.0**	**138.5**	**483.0**	**57.5**	**679.0**
% of total		**20%**	**71%**	**9%**	**100%**

Source: Oslo II Accords, Article 40, Table 2.

In addition to the 138.5 MCM Palestinian allocation in West Bank, an extra quantity of 3.1 MCM of fresh water from Mekorot for domestic use was to be made available to the PA for West Bank during the interim period, and 5 MCM for Gaza. The extra supply for West Bank from Mekorot was in addition to 27.9 MCM already being supplied by Mekorot at the time of the agreement. In addition, "future needs" of the Palestinians were estimated at 70–80 MCM.

The Need to Promptly Establish a National Water Company

As discussed in Chapter 5, the Water Law provides for creation of a National Water Company (NWC). The NWC would be set up on a business-like basis on similar lines to the Israeli water company, Mekorot. The role of the NWC would be to produce raw water both from natural sources and from desalination, to buy water from Israel, and to develop and manage national water carriers and distribution networks in both West Bank and Gaza.

A proposal for phased transformation from the West Bank Water Department (WBWD) to the National Water Company (NWC) is on the table. The new organization would be set up as an autonomous bulk carrier, responsible to an independent board and chairman appointed by the

cabinet. PWA recommends a three-phase approach to transform WBWD progressively into the NWC over a five-year period.[1] Phase 1 would restore WBWD's financial equilibrium in the near term, develop improved governance between the WBWD and customers, and improve bulk water provision. Phase 2 would strengthen WBWD though capacity building and improvements in operations and maintenance (O&M) and communications. Phase 3 would comprise the final steps to create the National Water Company.

The proposed NWC responds to concerns about accountability, efficiency, and viability of the current structure. The main problems that the NWC proposal is designed to solve are governance and efficiency. At present, WBWD is not transparent and information does not flow freely.[2] Accountability is only to PWA, with little or no responsiveness to other stakeholders — either the public or institutional stakeholders. There is no independent board or general assembly, and there is no procedure for hearing and responding to grievances. In addition, despite reporting to PWA, WBWD executes projects, whereas good governance would require separation between the policy maker (PWA) and the implementer. Efficiency is low, despite many years of technical assistance and donor investment.[3] The proposal for the NWC responds to these concerns by establishing the new organization as an autonomous bulk carrier, responsible to an independent board and chairman appointed by the cabinet.

The proposal includes detailed actions to implement the setting up of the NWC – but questions and ambiguities abound. The most important question is the feasibility of the proposed phasing, which depends on the ability of the existing institution to transform itself, and on WBWD being able to bring about improvements in water supply and financial performance before the NWC is actually set up. Critics point out that all these improvements have been targeted for over a decade with very little to show. A related question is stakeholder incentives. What are the incentives for stakeholders to make this new plan happen? What is different from all the other plans? Here the protracted timetable and step-by-step approach will require sustained political, public, and financial support. Finally, there is some lack of clarity about what the end institution will look like. Will it, for example, be the key public water engineering resource, able not only to drill wells but also to help service providers with their infrastructure projects?

On balance, immediate creation of the National Water Company is probably a better way to manage the risks than a gradualist approach. At a meeting to discuss plans for the NWC in early 2017, donors expressed the view that more than a decade of attempts at internal reform of WBWD had not produced expected results and that it would be best to establish the NWC legally, appoint the board, and then allow the board to get on with the restructuring, conducting reform steps within the new organizational structure. Experience shows that in such challenging restructuring situations, it is generally best to act decisively early on. Previous attempts to work from within WBWD have been costly and have had limited results. In any case, all stakeholders should be involved in the decision-making and implementation processes. All stakeholders, including donors, need to align on the decision and provide sustained moral, intellectual, and financial support until the job is complete.

Gaza

Only Two Viable Options: Desalination and Water Purchase

The aquifer that is Gaza's only freshwater resource has been destroyed. As discussed in Chapter 1 (Section 1.8), sustainable renewable resources in Gaza total about 90 liters per capita per day, but all of this is undrinkable and half is allocated to agriculture. Salinization has increased

dramatically over the last decade, resulting from overdraft of groundwater and consequent decline in network water quality.

With little prospect of nursing the aquifer back to potable quality, other means of supplying drinking water are essential. PWA has little capacity to regulate well drilling and groundwater extraction. More generally, the Gaza political situation suggests there is scant prospect of recovering control over the aquifer. In any case, parts of the aquifer have become so salinized that they are irrecoverable. Thus, although aquifer water can continue at least for some years to provide a source of low-quality network water, alternative sources are needed for drinking water.

Desalination and water purchase currently provide drinking water, and plans are to meet future needs by purchases and increasingly from desalination. Gaza supplies about 95 MCM of water through the network each year, but drinking water comes from water desalinated within Gaza (about 4 MCM) and from Mekorot purchases (about 6 MCM–8 MCM). For the future, Gaza has embarked on a broader desalination program. Proposals are under study for a major new desalination plant and for the construction of a Gaza-wide bulk water carrier pipeline.

In the meantime, purchases from Mekorot are on the rise. Current purchases are about 8 MCM, and a request has been put to Israel for a further 12 MCM as part of the 2013 Red-Dead Project memorandum of understanding.

Options for Improving Bulk Water Supply

Single Network Options

A major desalination plant and use of desalinated water as the principal source of network supply, mixing with saline groundwater to bring the quality of tap water to potable levels. The advantages of this option are that the source is within Gaza, so it brings some measure of autonomy, and there is limitless raw material. The disadvantages are the high capital cost of both the plant and the main and distribution networks (the "associated works");[4] the difficulty of doing big infrastructure projects in Gaza; the high energy requirement, and thus high cost and dependency on Israel; and the high cost of the desalinated water to be supplied to the consumer.

Purchasing desalinated water from Israel. "New" water is potentially available from four private sector desalination plants along the coast of Israel. These plants are reported to be working at only 75 percent capacity and to be looking for commercial sales. This purchase could to some extent depoliticize the issue of water imports and could be implemented under the possible Red/Dead agreement where Israel commits to supplying an extra 34 MCM annually, including 10 MCM for Gaza. The advantages are that it is technically simple and the water is readily available on a turnkey commercial basis with four delivery points already available along the border. The disadvantages are the dependence on Israel, the high cost of the associated works, and the high unit cost of water purchased.

Dual System Options

Smaller-scale desalination and tanker/supermarket delivery and/or medium-scale plants. The advantages of the small plant option are that it is financially and technically feasible. Small plants are already producing all of Gaza's potable water (see box 1.1 in Chapter 1 and photo 7.1). This is a vibrant area for the private sector and for public-private partnerships, provided that questions of regulation and water quality control can be

Photo 7.1: Reverse Osmosis Plant in Gaza

Source: Hydoconseil 2016.

resolved. It is also possible that medium-scale plants could be constructed and run either by nongovernmental organizations (NGOs) or by public organizations (Coastal Municipalities Water Utility, municipalities). An example of this approach is the plant recently constructed by the United Nations Children's Fund (UNICEF), which can produce 6,000 m^3 a day or 2 MCM a year, equivalent to just over 3 liters of drinking water for each of Gaza's 1.85 million people. If a ratio of 20 liters of drinking water per day is pursued, another five such medium-scale plants would suffice.

This approach is a practical solution at least into the medium term (five to seven years). There are challenges and risks, notably the dependence on imported energy and spare parts, and the relatively high cost of the product. There is a need for an associated water quality and health monitoring program. Baseline indicators of water quality need to be established and a monitoring strategy for private vendors implemented.

Smaller-scale desalination and local area network. This option could be modelled on the dual network supply system as practiced in various towns in Arizona and Florida. Under this option, the Coastal Municipalities Water Utility (CMWU) and the municipalities would continue to supply salty water from the aquifer to all households. A separate supply system would be constructed to deliver smaller quantities of desalinated water to households (or to standpipes or neighborhood centers or shops). The approach is already practiced on a small scale, with some standpipes and public fountains (see photo 7.2). The advantages are that that this brings network water to households at a lower cost than trying to make mix desalinated water with groundwater in a single network. The disadvantages are the cost of duplicating the network.

Regulation of groundwater abstraction to conserve quantity and quality. This is a practical and low-cost solution to sourcing bulk water. In the best of circumstances, the aquifer would recover and provide adequate quantity and quality of water for Gaza's needs. In any case, the aquifer remains the source of brackish water and should be conserved as far as possible as a feedstock for desalination and for nonportable uses.

Photo 7.2: Drinking Fountain in Gaza

Source: GIZ/PWA/CEP 2015.

Notes

1. PWA (2016a); PWA (2016b).
2. The PWA/Hydoconseil (2016) analysis of WBWD points out that WBWD does not publish data or accounts and fails in its legal commitment under Article (5) of the Water Law to provide "suitable quality drinking water." The recommendation is for more transparency, including specific contracted supply quantities and a communication campaign on the "struggle to manage effectively the bulk water."
3. Although it is hard to quantify efficiency because there is no comparator, five technical reports on WBWD over the last decade reach the same conclusion: that WBWD has benefitted little from the extensive technical assistance provided and a series of "turnaround strategies," that management is poor, and that the organization remains "inefficient." WBWD publishes no data itself, but WSRC records for 2013 show non-revenue water of 13 percent (a deterioration from 11 percent in 2012). Regarding commercial performance, WSRC estimates a working ratio for WBWD of 1.47 in 2013, indicating that WBWD is billing only 68 cents on the dollar, and collection efficiency of 32 percent, so that overall, WBWD is collecting only 22 cents on the dollar (PWA 2016a).
4. A donor conference was held on March 20, 2018 and pledges were secured for €456 million (80 percent of the total project cost).

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Chapter 8
Planning, Investment, and Financing Constraints to Water Service Delivery (Constraints to the Second "I" of IWII)

The Palestinian Water Authority (PWA) has developed strategic development plan for 2012–32, including an ambitious investment plan. The PWA needs to enhance the coordination with donors, who are the main financiers of the Palestinian development investments, and prioritize their needs linking it with institutional development and incentives (see table 8.1).

Table 8.1: Relaxing Planning, Investment, and Financing Constraints

The problem	The causes	Current solutions	This diagnostic's recommendation
• Investment plans are very ambitious. • Private sector participation is limited. • Project implementation is delayed.	• There is no clear planning mechanism, and LGU/SP and citizen engagement in the process is weak. • Donor financing is not integrated in a coherent prioritized planning framework. • There are restrictions on movement and access within a fragile context.	• Multiple strategic plans without prioritization.	Undertake an integrated planning process, including: • Realistic master planning for bulk water. • Participation of LGUs/SPs and citizens. • Integrated planning (IWII). • Prioritization (obtaining bulk water, reducing inequalities, improving the worst services). • Restructured PA/donor partnership.

Source: WASH-PD team.
Note: IWII = institutions, water resources, investment, and incentives; LGU = local government unit; PA = Palestinian Authority; SP = service provider.

Planning and Investment

Chapter 1 (Section 1.3) outlined the responsibilities of the Palestinian Water Authority (PWA) for establishing national plans, budgets, and targets and for investment programming and financing. The chapter also summarized the scope of the current investment program and PWA's proposals for future investment. This chapter looks in more detail at the planning and investment process and at the related constraints to improving service delivery.

Overly Ambitious Planning and Poorly Coordinated and Inadequate Financing and Investment for WASH Services

PWA's 2016 Strategic Development Plan (SDP) and the accompanying Water Sector Investment Plan (WSIP) 2017–2022 provide the framework for development of WASH 2017–2022, but are often very ambitious and leave many questions open. In May 2016, PWA produced the *Water*

Sector Strategic Development Plan 2017–2022 (SDP). The supporting *Water Sector Investment Plan (WSIP)* called for $1.25 billion for 240 new projects. The proposals are massive in their likely demands on finance and implementation capacity – but it is not clear how feasible they are. The SDP proposes a doubling of water resources. It is doubtful whether this can realistically be obtained. In Gaza, the main proposal is massive desalination, which raises issues of feasibility and financing (see Chapter 7). The realism of the proposed increase in reuse of treated wastewater can be questioned in terms of treatment capacity and quality, and in terms of farmer uptake. The proposals for further groundwater abstraction in West Bank would need to be negotiated in the Joint Water Committee (JWC). It is hard to see how the Gaza groundwater program could be made sustainable. Overall, while the SDP and WSIP are aspirational, they do not indicate what are the priority steps to achieving sector targets.

Investment is largely financed by donors within PWA plans and programs. Water and sanitation projects underway, valued at nearly NIS3 billion, are funded largely by donors (box 8.1). Gaza is the largest beneficiary, with the northern West Bank in second place. The sector is highly dependent on foreign aid, which provides 76 percent of project finance. The PWA and donors and nongovernmental organizations (NGOs) have generally followed a partnership approach to sector reform and are committed to coordination and joint approaches to investment, with the result that Palestinians benefit from a high level of per capita investment in water supply and sanitation. This high level of external finance is the major reason for the improvements in access to water supply and sanitation services since the Oslo Accords. There are many donors and, as always, they may have their own priorities. Donor support works best when it follows coherent and practical national plans. In general, as the Guiding Principles presented in table 5.1 in Chapter 5 recognize, with

Box 8.1: Investment in the Palestinian Water and Sanitation Sector

The predominant sources of financing for investment in the sector are international donors. Nongovernmental organizations (NGOs) also provide considerable support. Funding through the national budget – through the Palestinian Water Authority (PWA) and the Ministry of Local Government (MoLG) – is limited. Most donor funds are grants, although KfW (a German bilateral aid agency) and AFD (a French bilateral aid agency) make some loans, such as those to the Jerusalem Water Undertaking (JWU). Most of these loans and grants go through the national budget, but some grants are made directly to municipalities, Joint Service Councils, or Village Councils. Palestinian Authority financing is channeled through PWA and through MoLG's Municipal Development & Lending Fund (MDLF). PWA coordinates donor and NGO aid, and is responsible for soliciting funds and for preparing and supervising donor and NGO projects. Donors and NGOs also have their own coordination mechanisms, including EWASH (Emergency Water and Sanitation-Hygiene Group). The involvement of the various parties is presented in table B8.1.1.

Donors provide most of the funding (76 percent) for water and sanitation projects underway. Currently, some 114 projects valued at NIS2.914 million ($770 million) are being implemented. Around 38 projects, valued at NIS545 million ($145 million) are close to being agreed, financed, and implemented. In terms of the number of projects, the majority of projects (56 percent) receive funding through bilateral arrangements, while national funding accounts for 32 percent of all projects, and co-financing for 12 percent. In monetary terms, the bulk of funds are provided through bilateral arrangements (76 percent), while co-financing accounts for 22 percent, and national funding, 3 percent.

box continues next page

Box 8.1: Continued

Table B8.1.1: Investors in the Palestinian Water and Sanitation Sector

	Type of expenditure financed		Investment channel			
Investor	Capital expenditures	Operating expenses	National budget	MDLF	Donor funds	Other
PWA	Yes	No	Yes	No	Yes	No
MoLG	Yes	No	No	Yes	Yes	Yes (net lending)
Governorate	No	No	No	No	No	No
LGUs	Yes	Yes	Yes	Yes	Yes	Yes (net lending)
Donors and NGOs	Yes	Yes	Yes	Yes	Yes	NGO funds

Source: WASH-PD team.
Note: LGUs = local government units; MDLF = Municipal Development & Lending Fund; MoLG = Ministry of Local Government; NGO = nongovernmental organization; PWA = Palestinian Water Authority.

Gaza is the largest beneficiary, followed by northern West Bank. The northern West Bank is the largest beneficiary in terms of number of projects (40 projects), followed by the central West Bank (34 projects). In funding terms, Gaza is the largest recipient (NIS1.292 million). The northern West Bank is second (NIS1.076 million). In terms of governorates, Gaza has most projects (26), followed by Jericho (14), Bethlehem (13), and Jenin (12). Gaza as a whole is also the highest recipient of funds (NIS1.292 million), followed by Nablus (NIS 534 million) and Jenin (NIS 281 million).

Source: PWA 2017.

their emphasis on investment that is "needs driven and not donor driven," donors need always to look to a strong planning and programming lead from PWA.

In addition to the high level of dependence on aid and the multiplicity of donors, other factors complicate investment planning, including the political economy and the regional situation, indicating a need for strong coordination; donor alignment; and realistic, inclusive, and prioritized planning and programming by PWA. There is a big gap between PWA's planning and programming and the actual level of financing in the sector. Planning is also complicated by the political economy, regional situation, and intermittent hostilities (in Gaza), which make longer-term planning and development risky and shift the emphasis to short-term fixes. The SDP and WSIP were carefully prepared and reflect an understanding of local needs, but they are essentially exhaustive compilations. Planning and programming need to become more realistic, and donor coordination and alignment need to be strengthened. One neglected area has been consultation of the population and their involvement in the decision-making process. Current shortcomings can be resolved by more realistic planning and programming by PWA, and by strengthened partnerships, not only with donors and NGOs but also with the Palestinian people.

Impediments to Project Approval and Implementation Arising from the Israeli-Palestinian Situation

The operation of the Joint Water Committee and movement and access (M&A) restrictions have constrained project choice and severely affected implementation. Under the water governance arrangements in the 1995 Oslo Accord, a Joint Water Committee (JWC) was established to "deal with all water and sewage related issues in the West Bank," with decisions to be based on consensus between the two parties. Although this agreement was to be for a five-year interim period, it still governs the water sector today. Although ostensibly an arrangement for joint management of water, over the years the agreement and the way in which it has been implemented have failed to correspond to Palestinian needs. Development of both water resources and water supply infrastructure has been constrained by Israeli reluctance to agree to projects proposed. Movement and access (M&A) restrictions (see box 8.2) practiced by the Israeli administration in West Bank have impeded project implementation. The JWC has no remit in Gaza, but Israeli restrictions consequent on the political and security situation have curtailed access to power, fuel, and spare parts and have severely constrained investment and project implementation.[1]

Financing of Water Service Delivery

Flaws and Gaps in the Current Financing Model

The current financing model in the sector does not provide incentives for institutional performance and accountability. Capital investment financing in the water and sanitation sector provided by donors and the Palestinian Authority (PA) is implemented through PWA or through projects

Box 8.2: Movement and Access (M&A) Restrictions

Movement and access (M&A) restrictions refer to Israel's restrictions on movement and access of people and goods – both within West Bank and Gaza and through Israel to the rest of the world. The multifaceted restriction system consists of physical impediments such as roadblocks and barriers, as well as permit policies, administrative practices, and informal governance processes that effectively limit the freedom of the Palestinian people to move about within West Bank and Gaza, access resources, and engage in sustainable economic and social life, including obtaining work; investing in a business or undertaking construction; or importing, transferring, or exporting goods. The effects of these restrictions are far-reaching, as they impair planned development, private sector initiatives, and livelihoods across all sectors. Access is restricted for about 60 percent of the land of West Bank, and M&A restrictions have fragmented the territory into small and disconnected cantons.

Impacts are felt in the water sector, where these restrictions, added to the joint resource management and permitting processes agreed under Article 40 of the Oslo Accords, affect normal access to additional water resources, infrastructure development, and utility operations and maintenance.

Source: World Bank 2009.

(by the service providers and sometimes by the donors themselves). While there are some advantages (mainly economies of scale) from the direct execution of projects by PWA, the lack of adequate stakeholder consultation – especially with service providers and citizens who are the intended beneficiaries of these investments – may mean that these investments do not responding to local priorities.[2] The separation between asset creation (PWA) and asset management and maintenance (by service providers) does not create incentives for making investment decisions that are sustainable and create ownership. In addition, the top-down model of investment financing does not create incentives for service providers to improve their performance so that the assets created are used effectively and efficiently to meet service delivery demands.

The financing of sector investments is not aligned with the institutional framework of the sector. The central issue here is that service providers should make investment decisions and the financing model should enable them to do that by providing them with financial resources directly, to keep the accountability chain between the service providers and consumers direct and strong. At present, PWA makes investment and financing decisions, thereby not reinforcing the accountability chain. While PWA should as the policy maker develop the national investment strategy, it should make sure that financing is made available to service providers to implement investment plans.

Though water services are a significant revenue earner for local government units (LGUs), current models of LGU financing do not provide any specific attention to improving those services – and in practice tend to undermine the ability of water departments to finance operation and maintenance (O&M) and investment needs. There is no stable and predictable system of intergovernmental fiscal transfers for ensuring that all LGUs across West Bank and Gaza have adequate financing. The consequences have been that underfunded LGUs have tended to dip into water revenues to cover shortfalls in their budget (see Chapter 6). The current system of financing has two negative consequences for water services: no systematic access to investment planning and financing; and a persistent risk that funds that should be used for operation and maintenance or for investment will be drained away to finance other municipal activities.

Improvement to water service provision cannot wait for the reform of municipal financing and there are steps that service providers can take now to improve their autonomy. Clearly the issue of how to finance local government goes far beyond the water sector and the scope of this report. However, one first step to stopping the anomaly – or at least to keeping track of the situation – is for water departments to keep separate accounts and for the finances of water services to be ring-fenced. This would have two advantages. First, it would make municipal accounting more transparent; the shortfall in financing municipal services would be clear and would have to be dealt with. Second, it would provide clear incentives for water departments to recover their costs, as each water department would have to live within its income.

The Need for a Business-like Approach to Water Services and Financial Support Linked to Performance

Water services should be run on a business-like basis and financial management and accounting should follow accepted international standards for water utilities. PWA policy for water services (see table 5.1 in Chapter 5) includes provision for running water supply as a business: commercialization, ring-fencing of revenues, and full cost recovery. This would require service providers to set tariffs on a full cost-recovery basis[3] and to follow accepted international standards for financial management and accounting, including accounting on an accrual basis with both balance sheet and income and expenditure statements; maintaining an assets register; accounting for depreciation and constituting depreciation reserves; keeping separate ledgers for receivables and payables; and accumulating and retaining working capital. Accounts would be audited and published within six months of each year end.

Performance-based fiscal transfers can provide an alternative model for sector financing. Global experience has shown that service providers are able to respond efficiently to the preferences of their customers and stakeholders when they have access to stable and predictable sources of financing and the discretion to use those funds to meet their service delivery priorities. Performance-based fiscal transfer systems that allocate financial resources based on a rational formula result in provision of financing that is transparent and predictable to recipients. Since the eligibility to receive such transfers are often contingent on the recipients achieving predetermined performance benchmarks/indicators, this approach also serves as an incentive to improve institutional and service delivery performance. In West Bank and Gaza, the Municipal Development Project financed by donors has already introduced such a transfer system for municipalities to support municipalities needs (such as infrastructure and capacity building). It would be useful to explore the feasibility of replicating the performance-based fiscal transfer model in the water sector as a means of providing stable and predictable financing to service providers for meeting their capital investment requirements.

The various stakeholders must reach consensus on the sector financing model for water service delivery. It will be important for development of the sector that all parties agree upon and put in place sustainable financing mechanisms. For financing operations, this means essentially separating water operations from other municipal activities and running the water operation along business lines. For financing investment, it means a commonly agreed sector investment plan that is aligned with the sector strategy and that serves as an incentive for better institutional performance and accountability.

Private Sector Participation

Increased Efficiency – and Possibly Financing – through Greater Participation by the Private Sector

Experience with outsourcing has generally been successful, but experience with management contracts has been less positive.[4] The Palestinian water sector has had ample experience in outsourcing, the more traditional form of working with the private sector. PWA, in particular, has used consultancy services extensively to supplement its in-house capacity in the development of laws, regulations, policies, strategies, master plans, and the like. Private consultants have also been employed for the design, construction, and supervision of works, and for external auditing. Management contracts were implemented in Gaza (1995–99 and 2005–08) and in Bethlehem and Hebron (1990–91), but these were terminated early because of political and security conditions (see box 8.3). It is likely that the poor viability and accountability of many service providers have acted as a deterrent to private sector participation.

There is a supportive and largely complete legal framework for private sector participation and public-private partnerships (PPPs), which are actively encouraged in PWA policy and strategy actively. In addition, PWA is developing special PPP regulations in collaboration with other relevant ministries and authorities (the Ministry of Local Government, Ministry of Agriculture, Ministry of Health, and Environmental Quality Authority). Recent PWA strategies highlight the potential for private capital in large projects, notably wastewater treatment and desalination. The *Water Policy and Water Strategy* (2013–32) stresses the involvement of the private sector in the development of infrastructure and in the provision of services in the water sector. One priority is financing, implementing, and managing water supply and wastewater systems, including large facilities such as desalination plants and the main wastewater treatment plants. Contracting out of functions of the future National Water Company (NWC) and the proposed regional water utilities and outsourcing of billing and collection and customer services are also targeted. The *National Water Sector Strategic Plan and Action Plan* (2017–22) also emphasizes this commitment to public-private partnerships and emphasizes the wastewater sector as a key area for the implementation of partnership projects with the private sector. The PWA *Strategic Plan* (2016–18) identifies

Box 8.3: Mixed Experiences Illustrate the Conditions under Which Management Contracts Succeed or Fail in West Bank and Gaza

Over the last two decades, several management contracts have been let for water services. Contracts in Gaza ran from 1995 to 1999 and from 2005 to 2008, with the successful establishment of the Coastal Water Management Utility (CMWU), reduction in non-revenue water to 25 percent, and an increase in the collection rate to 85 percent. However, the conditions created by the Intifada led to a *force majeure* situation that resulted in the termination of the contract. Management contracts that covered Bethlehem and Hebron were less successful, largely due to the internal political situation. These contracts were terminated, also on the grounds of *force majeure*.

The technical assistance contract with the West Bank Water Department (WBWD), which was financed by the French bilateral aid agency AFD from 2000 to 2005, was in part formulated like a management contract. The consultant was given authority to work hands on with the management and technical team to overcome some of the operation and maintenance problems, reduce non-revenue water, and build institutional capacity. However, the result was only partially successful. Performance improved, but the consultant's recommendations on structural changes to WBWD were not accepted or implemented and performance deteriorated again after the end of the contract.

Experience with management contracts and similar arrangements has thus been mixed. Key factors in success are: a national partner dedicated to implementation and to achieving the targeted results; well-designed contracts and performance indicators; and stability in local politics and in the security situation.

Source: Various World Bank documents.

enhancement of the participation of the private sector in the management and distribution of water and wastewater as one of its three strategic objectives.

Although outsourcing is likely to continue to be the most practiced option, preparations to move ahead to much higher levels of private sector participation in financing and management are also being pursued.

PWA can also take steps to implement the reforms it has proposed that would facilitate private sector participation. PWA's 2016 report, *Water Governance in Palestine: Sector Reform to Include Private Sector Participation*, provides an overview of the governance challenges facing PPPs as well as the way forward by means of improving the budget process and financial sustainability, the regulatory framework, and stakeholder engagement to improve accountability and citizen buy-in. The report contains a practical and detailed action plan.

However, current conditions limit the possibility for large-scale private participation in water. The private sector lacks confidence in the transparency and stability of government policy and in the financial viability of water sector entities and their accounting and financial management standards. Few, if any, current water operations are bankable for private or commercial bank investment. There are, nonetheless, interesting opportunities for public-private partnership in support of private sector water supply, notably in Gaza, where there is already a thriving private sector desalination and tanker trade (see box 1.1 in Chapter 1). One proposal for a PPP arrangement in Gaza is described in box 8.4.

Box 8.4: Supporting Private Water Supply in Gaza through Public-Private Partnerships

In 2016, the French bilateral aid agency AFD proposed a project to support development of private water supply in Gaza. The objective was to strengthen service providers' capacities, particularly in: operation and maintenance of reverse osmosis (RO) units (especially measures to increase membrane lifespan); improving the efficiency of energy use to reduce production costs; improving water quality through chlorination and water quality monitoring; and brine disposal. A specific objective was to reduce the currently high production costs of reverse osmosis by improving electromechanical equipment and development of solar energy to replace generators. An associated customer awareness program aimed to promote chlorinated water as safe water. The proposal recommended working through targeted soft loans from the commercial banking system.

AFD also outlined a more ambitious proposal for innovative PPP arrangements between private service providers and public institutions (the Palestinian Water Authority, the Coastal Municipalities Water Utility, and municipalities), with private reverse osmosis plants producing water to be distributed through water networks rather than by truck. This would reduce the high costs of truck distribution and make desalinated water more affordable for the poor.

Source: Hydroconseil 2016.

Notes

1. For a full discussion of the political economy of the Oslo Accord agreements on water and their effects on the water sector, see Chapter 9.
2. For example, during the team visit to Yatta in November 2016, a PWA investment was laying out water pipes with no consultation with the local government unit.
3. While full cost recovery is an essential longer-term objective, there may be a need to progressively increase cost recovery as services improve and efficiencies increase. An immediate goal is to cover the costs of operation and maintenance so that the service provider remains solvent. Over the longer term, recovery of depreciation and ultimately financing of capital investment may be the objective.
4. Much of this section is based on the excellent analysis by PWA/Orgut (2017).

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Chapter 9
Political Economy Constraints to Improved Service Delivery

A number of political economy factors have constrained the ability of the Palestinian Water Authority (PWA) to improve service delivery. This chapter first discusses the constraints arising from the Israeli/Palestinian situation and then examines the constraints arising from the separate but related internal political situation. A third section looks at the complex political economy issues surrounding water resources and how to source more bulk water.

Constraints Arising from the Israeli/Palestinian Situation

Water governance arrangements were established under the Oslo II Accords in 1995. Governance of the Palestinian water sector is dominated by the terms of Article 40 of the Oslo Accord of 1995 (box 9.1). The general expectation was that this interim agreement would be revised within a five-year period. However, it still governs the water sector today, 22 years after the Oslo Accord went into effect and 17 years after the expected end of the interim arrangement.

The Joint Water Committee (JWC) set up under Article 40 of the Oslo Accords has proved more a brake than an aid to development and management of Palestinian water resources and services. At the time of Oslo, Article 40 was seen as a breakthrough for Israeli-Palestinian cooperation, and it was the first-ever formal agreement on joint water resource management in the Middle East. However, over the years the agreement and the way in which it has been implemented have failed to correspond to Palestinian needs. Development of both water resources and water supply infrastructure has been constrained by Israeli reluctance to agree to projects proposed. Palestinians have faced technical challenges in trying to exploit the extra resources allocated from the Eastern Aquifer. Movement and access restrictions practiced by the military administration of West Bank have impeded project implementation. For nearly a decade, the Palestinian Authority (PA) withdrew from the Joint Water Committee on the grounds that the Committee was not facilitating development of the Palestinian water sector and that Article 40 effectively gave Israel a veto over the Palestinian water sector but no corresponding powers to Palestinians over Israeli water management. Only in 2017 did the PA agree to the reconvening of the JWC.

These constraints affect service provision both by restricting access to adequate bulk water supplies and by constraining investment and implementation of projects for developing water and sanitation infrastructure. The history of the last 20 years demonstrates that, under these challenging conditions, supply has lagged well behind burgeoning demand. PWA has not been able to develop even all the water resources agreed under Article 40. Its ability to regulate groundwater extraction in West Bank has been constrained, and water allocations to municipal and industrial (M&I) uses have become increasingly inadequate. In Gaza, water supply and sanitation services have deteriorated as Israeli restrictions consequent on the political and security situation have curtailed access to electricity, fuel, and spare parts and have constrained investment and project implementation. Moreover, as discussed previously (Section 1.7 and Section 6.6), the PA been obliged to turn more and more to water purchases from Mekorot, increasing dependence on Israel.

The underlying political economy issue is thus that current governance arrangements give Israel a veto over Palestinian water sector development and services and leave the West Bank dependent on Israel for adequate water. Palestinians believe that there is no equitable mechanism for joint planning and management, and that they are dependent on Israel for agreement to sell back to them water that they consider their own. Water has become a part of the fractured Oslo deal, a politicized issue that lacks either a political dialogue or an institutional mechanism to resolve it. Palestinians do not feel powerful over outcomes and cannot see how to move forward. Water resources management and water services have become emblematic of a wider disempowerment.

The result is a highly politicized context that make it hard to treat water in a pragmatic way. In the politicized context, Palestinians are very reluctant to see water services as simply a business. Negotiations with Israel over water purchase

Box 9.1: Oslo II Arrangements on Water

Article 40 of the 1995 Oslo II agreement contains provisions on water and sewage that recognize undefined Palestinian water rights, and returned some West Bank water resources and services responsibility to the Palestinian Authority (PA). Essentially, Article 40:

- Established governance arrangements for a five-year interim period, notably a Joint Water Committee (JWC) to "deal with all water and sewage related issues in the West Bank," with decisions to be based on consensus between the two parties.
- Allocated to either party specific quantities of the three West Bank aquifers underlying both territories (the share allocated to the Palestinian West Bank was less than one-third of the allocation to Israel and the settlements). Issues relating to the portion of the shared aquifer underlying Israel were not included in the mandate of the JWC.
- Provided for interim extra supplies from new wells and from Mekorot. An extra 28.6 million cubic meters (MCM) was to be allocated to Palestinian needs.
- Estimated "future needs" for the Palestinian West Bank at 70 MCM–80 MCM.

Source: World Bank 2009.

have an underlying subtext of unfairness. The PWA's plans for water resource development are aspirational, amounting more to statements about recovering control over natural resources than to practical planning. The PA is nonetheless striving to move forward, as evidenced by the recent reengagement with the JWC.

Constraints Arising from the Internal Political Economy

The divergence of interests between the Palestinian Water Authority (PWA) and the Ministry of Local Government (MoLG) leads these institutions to have differing approaches to water services. This divergence of interests between PWA and MoLG, and various repercussions for financing, are discussed in Chapter 6.

The level of understanding and ownership of the reform process are uneven, weakening incentives to implement it. Part of the problem may be a lack of information—consumers, for example, are largely unaware of the nature of the reforms and of how they may benefit from them. There may be a need to enlarge the evidence base that the reforms will actually work—that a utility model will perform better than a municipal water department, or that consolidated professional service providers can deliver better services and be more accountable than small, community-run ones. At an institutional level, a municipality or the MoLG may actually view the reforms as a loss of control over an important revenue source. In the case of a smaller local government unit (LGU), there may be fear that in merging their water services in a larger entity, they may be surrendering control and will end up worse off. At a more general level of public policy, there is concern that "big" may not be all that "beautiful" and that centralizing services and a top-down reform approach runs counter to Palestinian (and global) trends toward decentralization, subsidiarity, and local empowerment.

Political divisions between Gaza and Ramallah have complicated governance arrangements and limited PWA's ability to operate effectively in Gaza (see table 9.1). Contacts between PWA and its Gaza sub-ministry are difficult, especially as staff can rarely travel. Over the past decade, joint working between the two parts of PWA has dwindled. The establishment by Hamas of a

Table 9.1: Relaxing Political Economy Constraints

The problem	The causes	Current solutions	This Diagnostic's recommendations
Geopolitical issues			
Problems with geopolitical causes include: • Limited room for maneuver in the West Bank to develop water resources or construct infrastructure. • No agreement with Israel on Palestinian water sector development. • Extreme implementation constraints for water infrastructure and major energy constraints for operations in Gaza.	• Article 40 of the interim Oslo Accords of 1993 gives Israel a veto over water sector development in West Bank. • In West Bank, JWC de jure control of development is exacerbated by de facto control by the Civil Administration, especially in Area C. • In Gaza, movement and access restrictions give Israel a veto on water sector infrastructure and operations.	Revive the JWC and try to get agreement for bulk water purchases and for infrastructure development.	• Need to marshall international political support in dialogue with Israel to attain Palestinian water security. • Pursue coherent integrated planning to be discussed with Israel in the JWC.
Internal political issues			
Problems affecting West Bank with internal political causes: • Lack of buy-in on the 2014 Water Law and reform plan.	• Divergence between PWA's water services objectives and MoLG's municipal financing objectives.	• MoU between PWA and MoLG.	• Refresh national debate on water sector reform. • Reform municipal finances.
Problems affecting Gaza with internal political causes: • Groundwater overdraft and salinization. • Effective operation of the CMWU as a service provider. • Nonpayment for bulk water.	• Scant cooperation between Hamas and the PA. • Two PWAs in Gaza.	• Recent Hamas/Fatah reconciliation plan on national unity government.	

Source: WASH-PD team.
Note: IWII = institutions, water resources, investment, and incentives; JWC = Joint Water Council LGU = local government unit; MOLG = Ministry of Local Government; MOU = memorandum of understanding; PA = Palestinian Authority; PWA = Palestinian Water Authority; SP = service provider.

rival PWA and the progressive shrinking of PWA Gaza's staffing and capacity have limited its effectiveness. PWA can no longer carry out key areas of its mandate such as water resources regulation and management.

More open and inclusive discussion of issues could help relieve political economy constraints and facilitate coordination and reforms. The political economy constraints have contributed to limited sharing of information. For example, PWA is not making public the reports every six months on the reform process as it proposed to do. Indeed, PWA has not published an annual report on the water sector since 2012. This lack of information and communication from PWA leaves service providers and stakeholders with limited information. A more open debate throughout the Palestinian territories about water challenges and options that includes all stakeholders may promote both understanding the problems and reaching consensus on solutions.

Political Economy Challenges to Increase Supply in West Bank

West Bank is facing a large and growing gap for water for municipal and industrial (M&I) uses. According to PWA calculations, this gap amounts to 66 MCM—65 percent more than current municipal and industrial (M&I) supply. Ways of bridging this gap include: reducing losses, some of which are physical losses from leaking networks, and some of which are water actually consumed but not billed for one reason or another; increasing supply from internal groundwater and springs or from desalination; transferring water from agriculture, perhaps compensated by allocation of treated wastewater; and buying more water from Mekorot. Each of these ways is impeded by specific political economy challenges.

Reducing losses would require both a tough stance by the PA and cooperation with Israel. Losses include considerable volumes of water stolen through illegal connections. Reducing this component of the losses requires a tough stance by both the administration and service providers. In West Bank, there may be political will to tackle water theft, but it requires cooperation with Israel to address the problem in Area C, where most theft is thought to occur. The recent new agreement with Israel to revive the Joint Water Committee (JWC) (see Chapter 7) could be interpreted as allowing the Palestinian Authority (PA) a freer hand to intervene in Area C. The implementation of this new agreement will demonstrate whether this is the case. It may be that even willingness to cooperate in the JWC may not overcome restrictions imposed by the Civil Administration.

Increasing production within the West Bank would also require JWC approval. Increasing supply from the West Bank's own resources falls within Article 40 and the prerogatives of the JWC, so that any development of new water resources would require Israeli approval in the revived JWC. One nonconventional resource proposed by PWA is brackish water desalination. However, given past Israeli stances on such projects, it is likely that a desalination project could proceed in West Bank only if it had Israeli cooperation.

Transfer of water from agriculture would be contentious politically and raise technical difficulties. PWA has proposed that where it is economically and technically feasible, water might be transferred out of agriculture, with compensation in the form of return of treated wastewater. This kind of exchange has been practiced in neighboring Jordan for over 30 years, and today 80 percent of water used in Israeli agriculture is treated wastewater. However, small-scale experiments in West Bank to date suggest that transfer of water from agriculture compensated by allocation of treated wastewater would be furiously resisted by farmers and would strike at the image of the farmstead and traditional Palestinian rural life. It would also pose practical problems of water conveyance from farming areas to towns. It would be contentious politically, threatening the prosperous Palestinian agricultural sector and undermining the PA's policy of sustaining the rural economy and maintaining a substantial rural population for both economic and strategic purposes.

Increased purchases of water would increase dependency on Israel and would be seen as effectively acknowledging the Article 40 allocation of West Bank water rights. Buying more water from Mekorot is a possibility, as Israel has increased its desalination capacity considerably and is now in a position to become a commercial net water exporter. The proposed Red-Dead deal includes a commitment by Israel to provide an extra 34 MCM of desalinated water to the Palestinian territories. However, as discussed, this solution confronts Palestinians with difficult issues of water sovereignty and dependence on a relationship that is fraught with political and geopolitical risks. Inevitably the question of water is part of a broader dialogue. Israel is likely to enter into a commitment for extra water sales only if it were seen as being within its own political interests: that is, bringing some advantage beyond the benefit of sale of surplus water. From the Palestinian perspective, extra purchases would increase dependency and would be seen as recognizing the perpetuation of Israel's de facto control of West Bank water resources

and the allocation of those rights under Article 40. However, to be practical, the only solution to more than marginally narrowing the gap between supply and demand in the West Bank is water purchase from Israel.

Political Economy Challenges in Gaza

Many of the options for increasing water supply in Gaza also raise political economy issues. Chapter 7 assessed a number of options. The option of *recovering control over groundwater* is not only problematic practically (Chapter 7) but governance conditions in Gaza do not currently permit the application of the regulatory framework to manage the groundwater resource sustainably. It is also doubtful that there is the political will to get tough on water theft. The option of *desalination* is extremely costly, as well as energy dependent, which raises questions of whether tariffs (and cost recovery) at the required rate would be politically viable. In addition, major infrastructure projects of this kind typically encounter massive implementation constraints, largely due to movement and access restrictions maintained by Israel. *Transfer of water out of agriculture* and *reuse of wastewater* raises the same political economy problems as in West Bank. Water purchase from Israel is a feasible option but would be politically unpalatable and would be seen as increasing strategic vulnerability.

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Part 4

The Way Forward

Casting a Concrete Dome for a Reservoir in Gaza

Palestinian Water Authority's Communication and Media Department.

Part 4 sets out key areas where current initiatives could be strengthened and streamlined.

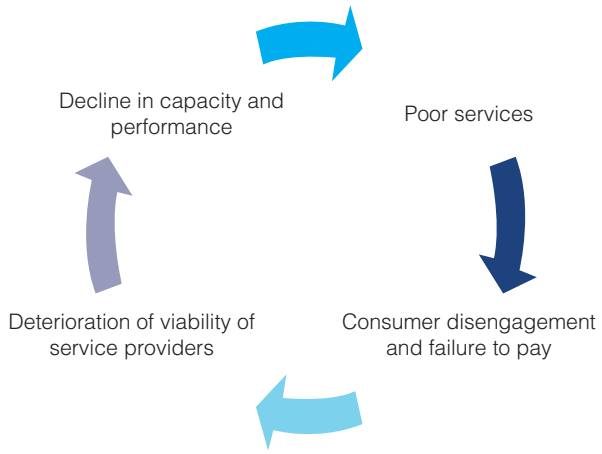
Chapter 10
A New Way of Thinking (IWII)

The Receding Goal of Water Security for Palestinians

Palestinians have not achieved water security – and in some areas water security is slipping away. The Palestinian Authority (PA) has been working for a decade to reach high standards in water supply and sanitation and an ambitious restructuring and investment program is underway. However, after ten years this program has not yet delivered service improvements to the Palestinian people. In fact, over the last 20 years, Palestinian access to internal renewable water resources has deteriorated sharply and water services in many locations have deteriorated, particularly in Gaza.

Palestinian water services in both West Bank and Gaza risk becoming entrapped in a vicious cycle – a cycle of inadequate water availability, poor services, and consumer disengagement and failure to pay, leading to deterioration of the financial position of service providers, demoralization of staff, and stakeholders and further decline in capacity and performance (figure 10.1). Many Palestinian service providers are already far into this cycle of degradation. Although there is not necessarily a connection between this cycle and domestic or regional political tensions, these also pose risks.

Figure 10.1: The Vicious Cycle of Palestinian Water Services



Building a Framework for Incentivizing Performance and Accountable Service Delivery: IWII

The current deterioration needs to be reversed. Despite the extraordinary efforts of the PA and the Palestinian people, water security is slipping away. If it is not to pass entirely out of reach, something more – and something different – needs to be done. Palestinians deserve secure water sources and a modern service delivery system matching that enjoyed by Israelis. This calls for a decisive shift to a new culture that asserts Palestinian rights to water security, and in particular to decent water supply and sanitation services for all.

An integrated framework can incentivize and enable performance and accountable service delivery for both West Bank and Gaza. That framework would combine *institutional change (I)* with *adequate water resources (W)* and with *investment (I)* and integrated in an *incentives (I)* package (***IWII***). The framework needs to improve the efficiency and accountability of service provision through institutional change and to ensure that all parties are on board with the plan, and to bring adequate water and investment that will enable providers to deliver affordable quality water supply and sanitation services.

The First "I" of IWII: Making Institutions Accountable and Efficient

The agreed sector reforms essentially put the citizen first by prioritizing sustainable, efficient, and equitable service provision.

- **At the *central level***, the priorities are: (1) transfer of all mandated functions to WSRC; (2) speedy establishment of the NWC; and (3) a mid-term review of sector reform objectives, strategy, and implementation program in order to ensure alignment between the Palestinian Water Authority (PWA), the Ministry of Local Government (MoLG), the Ministry of Finance and Planning (MoFP), and other stakeholders, including service providers and consumers, and to clarify roles and responsibilities for the transition period.

- **At the *local level***, the pathway is for progressive movement of service providers along a spectrum that provides for accountability and financial and managerial autonomy. Institutional provisions need to ensure accountability both upward and to consumers, financial and managerial autonomy, and financial management and accounting to internationally recognized standards so that service provision can be run on a business-like basis.

- A ***time-bound transitional plan*** is a requisite, as well as learning from energy sector reforms. The water sector has much to learn from what has and has not worked with the energy sector reforms in West Bank and Gaza. Given the many parallels between water and energy reforms, engagement between PWA, MoLG, and development partners with energy sector professionals at the national and local level would help devise an incentive structure that takes into account the political economy factors.

- ***Priority objectives*** would be: (1) to transform the current web of hidden subsidies that incentivize bad performance into systemized targeted support that rewards good performance; (2) to launch the two clustering pilots proposed by PWA for North Jenin and Salfeet; (3) to initiate the dialogue on how to provide stable and predictable financing for investment; and (4) to set out templates and support programs for different models of institutional transformation within the overall framework of the 2014 Water Law.

The "W" of IWII: Addressing the Bulk Water Challenges

There needs to be a clear plan for procuring and distributing adequate potable water equitably and for developing the needed bulk infrastructure.

For West Bank, the imperative is getting more water and distributing it fairly:

- **PWA should lead a governmental process of planning for supply and demand and a political process of negotiating for extra water resources.** A top priority is to negotiate with Israel for extra water. The support of the international community is needed to facilitate the agreement and to follow up on its implementation. The negotiation should cover both internal resources and cross-border water transfers, and the right of the PA to develop and manage water supply and sanitation infrastructure within Area C. At the same time, existing groundwater resources need to be husbanded and wastewater reused wherever feasible.

- **There is a need for realistic planning.** There is a need for a *realistic* West Bank water master plan and for a *realistic* investment plan to develop the bulk water network. Multiple plans prepared to date, including the recent Strategic Development Plan (SDP), aim too high.

- **The National Water Company (NWC) needs to be speedily established and to be run on a business-like basis.** The NWC would play the key role in the equitable and efficient distribution of bulk water, including the expected extra water from Mekorot, and would be responsible for planning and developing the extra infrastructure required to distribute this water. The proposed corporatized structure of the NWC offers prospects of depoliticizing the bulk water issue, and of putting bulk water supply onto a financially sustainable footing. Experience has shown that steps to establish the NWC all at once and soon rather than gradually would work better.

- **Transparency and broad stakeholder involvement would increase ownership and strengthen the planning process.** Citizen and stakeholders at local and central level should be brought in to discussions on the water master plan and investment program.

For Gaza, the imperative is to develop practicable plans for potable water:

- **Studies on delivery of large-scale desalination are at a decisive stage, and decisions need to be taken in the light of financial, economic, and implementation feasibility.**

- **It would be worthwhile to look at other options for the short and medium term (five to seven years).** This could include support to regulated private sector desalination, perhaps on an output-based aid (OBA) basis. In addition, a nongovernmental organization (NGO) or a municipality could run one more medium-sized desalination plants similar to the plant recently constructed by UNICEF. These options could be combined with the possibility of twin potable/non-potable networks. It might also be possible to nurse parts of the aquifer back to health.

- **Another option is further purchases from Israel.** A further 12 MCM annually is under negotiation in the context of the Red-Dead memorandum of understanding.

- **A bulk carrier and distributor is also needed for Gaza, both for water purchase and distribution and to run desalination.**

The Second "I" of IWII: Increasing Investment and Integrating It within the Framework

Investment needs to be efficient and prioritized within agreed plans that have been debated with citizens.

- **A reinvigorated planning process**: The entire planning, budgeting, financing, and implementation cycle needs to become better integrated to respond to realistic goals, with national priorities linked to local plans.

- **Realistic master planning** needs to be interpreted in the form of a national investment plan that reconciles national priorities and realities with local needs and stakeholder views and that includes bankable projects that integrate institutional change and water into investments.

- **Investment needs to be focused on priorities**, particularly on reducing inequality of access in West Bank and on solving the Gaza water crisis, including updating the 2012 investment plan for Gaza. Strengthening citizen engagement in the investment planning process by institutionalizing consultations and participative planning will enable sector investment plans to be more inclusive as well as reflect better the priorities of citizens and customers.

- **Investment is needed not only in infrastructure but in institutional change and strengthening and in capacity building.** To enable the alignment of investments with institutional reform and capacity building, it is important to reform the financing model in the sector. Instead of input- based investment decisions taken in a top-down manner, performance-based fiscal transfers or output-based aid should be adopted as a mode of financing in the sector. Within this new framework, the PA would provide transparent and predictable financing to service providers against specified institutional performance benchmarks and service delivery outcomes.

- **Private investment needs to be brought in wherever possible.** Where there is capacity and comparative advantage, a greater role for the private sector would be an efficient approach. PWA needs to implement its new framework for public-private participation, and specific opportunities for public-private partnerships such as smaller-scale desalination in Gaza need to be actively explored.

The Final "I" of IWII: Incentives for All Stakeholders

- **The PWA/donor partnership needs to be renewed.** Donor buy-in to a coordinated IWII approach is essential to ensuring that the program is implemented as agreed. Donors need to partner with PWA constructively to prepare realistic sector development plans. Donors also need to harmonize and align their support to the Palestinian water sector. Some form of sector-wide approach, with strong coordination mechanisms and forums for dialogue, is indicated.

- **All elements – institutional change, water, and investment – need to be integrated and linked to results at the local level.** Residents in a town who today receive network water once a month want to see – and be involved in – an integrated plan for IWII that will provide adequate bulk water, improve the efficiency and accountability of their service provider, ensure that all parties are on board with the plan, and attract investment that will actually deliver affordable quality service out of the tap.

- **No change can take place unless the people of West Bank and Gaza are motivated.** Incentives need to be aligned. *Within the PA*, agencies and decision makers must be

convinced that change is in the interest of citizens and the nation, and that it is affordable for a lower-middle-income territory. At *the local government level*, municipalities and village councils must be convinced that change will bring better services at an affordable cost and that local government finances will not be adversely affected. *Service providers and their staff* need to be motivated. Being empowered and enabled to provide good service is the most powerful incentive in this respect. *Consumers* need to see how they will be better off as a result of the changes – and that they are empowered in the process, not just to complain but to debate and affect outcomes. *Donors* need to see how their investment can be aligned and harmonized within a coherent plan that will deliver sustainable, improved services for Palestinians.

- **Change needs to be a directed but inclusive process, with PWA in the driving seat.** Change needs to be built around practical, demand-driven programs for IWII – institutional change, water resources, investment, and incentives – debated among all stakeholders. PWA is the leader, conceiver, planner, guide, and facilitator of all this and will need strengthening to be able to carry out these functions. At the level of service providers, PWA and MoLG will need to provide guidance and support to the preparation and implementation of IWII plans, and will need to be strengthened to carry out this role.

- **Incentives for local government units to participate in reforms need to be sharpened by separating the issue of their financing needs from the responsibility for delivering water supply and sanitation services**. Issues of municipal finance reform need to be aired, but improvement of water service delivery should not be held hostage to solution of the problem of how best to finance municipal budgets.

- **There is an opportunity to use IWII to incentivize and accomplish reform**. For example, investment, combined with assurance of adequate water supplies, can be prioritized toward service providers that are already undertaking institutional reform or are ready to reform. This could form the basis of a demand-driven, output-based approach to sector reform and investment.

Act Now! Do Not Let the Best Be the Enemy of the Good

- **Dialogue and transparency at all levels will improve ownership and outcomes.** PWA and MoLG need to engage in dialogue with each other and with service providers, stakeholders, and donors to review ways to improve service delivery and to provide the evidence base for good policy decisions. The PA, with the support of international partners, needs to engage with Israel to pinpoint areas of cooperation, particularly on water resources development and on bulk water, as well as on treatment of sewage. Platforms for dialogue need to involve the donor community to strengthen harmonization and alignment of donor programs with national strategies.

- **The agreed reform path should be constantly questioned and reconfirmed.** Incremental initiatives along that path are possible and good. Just because the NWC or regional utilities are not yet in place does not mean that a service provider should not implement change that will improve accountability and financial and managerial autonomy.

- **Continue to strengthen the Water Sector Regulatory Council (WSRC) and the excellent benchmarking work that has been done to date**. Making service provider performance data available is not only currently providing service providers with soft incentives to modify behaviors, but the data also enables sharing of experience among service providers that are looking to improve performance indicators. WSRC, PWA, and MoLG can use this data to understand variation in performance among providers and to identify and prioritize engagement with poor performers. In addition to the benchmarking data,

PWA and MoLG should can also take advantage of the new Local Government Assessment to understand priority areas for engagement in locations where water supply and sanitation services are lacking.

- **The best should not be the enemy of the good; there is much that service providers can do now without waiting for major reform or investment.** For example, accountability, transparency, and financial stewardship can be greatly improved by the adoption of robust financial management systems in place of municipal accounting. Service providers can keep water revenues separate and can account for depreciation and surpluses. They can set targets for reduction in non-revenue water, adopt computerized billing systems, establish policies for bad debts, and outsource debt collection. The nascent collaboration among service providers within the Palestinian Union of Service Providers offers excellent opportunities for cross-fertilization and exchange of best practice.

Regional Coordination and collaboration would enhance water management and service delivery. The activation of the Palestinian Israelis Joint Water Committee is important to coordinate water and wastewater sector development in West Bank and Gaza, since its the authorized body to approve water and wastewater development projects (see box 10.1). It will also help in facilitating projects implementations.

Box 10.1: Encouraging Progress in the Joint Water Committee and on Water Reform and Investment

On May 25, 2017, the Palestinian Water Authority convened a meeting of the Water Sector Working Group, an interagency/donor forum for sharing information. Among the highlights:

- The first meeting of the Joint Water Committee (JWC) between Palestinians and Israelis for a decade took place on May 16, 2017, with positive outcomes. Israel agreed to drilling of the Janzour well, which will provide 150 m^3/hour for Jenin; to upgrade Um Safa well to provide additional capacity of 4,000 m^3/hour for Ramallah; and to provide information on past bulk supply and to retroactively review past bulk water billings from Mekorot and to consider a refund in case of overcharging.
- The parties discussed the implementation of the 2013 memorandum of understanding (MOU) between Palestinians and Israelis, with both sides agreeing on: quantities of extra water to be supplied by Israel, with a total 32 MCM by 2022 (22 MCM in West Bank and 10 MCM in Gaza); quality of water; location of the connection points; and the infrastructure required to absorb the required quantities at the agreed connections. On price, the Palestinian position is that a deal would be attainable only if Israel agrees to sell water at cost.
- The Palestine Water Authority provided an update on the international politics of water. Palestinian water politics has attracted the attention of members of the U.S. Congress, who have sent a bipartisan letter calling upon the Trump Administration to regard water as the “low-hanging fruit” of an ultimate peace deal. As such, a special U.S. envoy for peace has been appointed. The first meeting between the Israeli and the Palestinian sides together with the special envoy took place on May 26, 2017.

box continues next page

Box 10.1: Continued

- On the reform program, the Minister stressed the need to implement the 2014 Water Law based on a carefully studied action plan. The government has entrusted the Palestinian Water Authority (PWA) to implement projects and PWA stands firm on that. The projects that PWA wants to implement are all listed in the 2017–2022 Strategic Development Plan, which is an integral part of the National Policy Agenda. The priorities in the sector are to build desalination capacity in Gaza, and to begin implementing the Water Law in the West Bank by establishing small water utilities or Joint Service Councils. In this regard, an MOU is being finalized between PWA and MoLG. Only after service providers start paying their past debts to the West Bank Water Department (WBWD) can the National Water Company be established.
- PWA is making good progress on the central Gaza desalination project and held a pledging conference in March 2018 where it secured 80 percent (€456 million) of the project cost.
- An important result of the meeting was that the Minister agreed to convene an ad hoc working session with donors organized by PWA to discuss immediate needs in Gaza. However, PWA is preparing a mapping exercise to identify immediate water and wastewater needs for Gaza with the support from the Netherlands government and the World Bank. PWA will notify development partners when finished. While the central desalination project is a long-term project, the immediate needs for Gaza must be presented by PWA and discussed with the donor community (both humanitarian and development donors).

Appendix A Constructing a National Asset Index using MICS Data

A consistent asset index was constructed for the 2010 and 2014 rounds of the Multiple Indicator Cluster Survey (MICs) using Principal Component Analysis (PCA). The estimation of relative wealth is based on the first principal component. A similar set of assets was selected across rounds.[1] The loading matrix for each asset across years is shown in table A.1. The asset index was normalized to be between zero and one.

The distribution of population by quintiles was constructed using a consistent asset index and the original MICS index (table A.2). Using the original wealth index results in an implausible shift of the poor population to Gaza in 2014 and a complete change in the distribution compared to 2010, with virtually no one from the poorest wealth quintile living in the West Bank in 2014 (table A.3). The consistent asset index also shows deterioration of well-being in Gaza in 2014, but the results are not as drastic as those derived from the original wealth index.

Histograms of the asset index in 2010 and 2014 are shown in figure A.1. The distribution of scores tends to follow a normal curve in both years without serious issues of clumping or truncation.

Table A.1: Loading Coefficients for Assets Used to Construct the Consistent Asset Index for the 2010 and 2014 Rounds of the MICS

	2010	2014
Number of rooms per capita	0.1531	0.0377
Computer	0.2985	0.3133
Sand floor	–0.1610	–0.0519
Ceramic floor	0.3415	0.3405
Cement floor	–0.3061	–0.3426
Villa	0.0693	0.0990
Cook using LPG	0.1576	0.2430
Cook using wood	–0.2082	–0.2128
Radio	0.2155	0.1894
Phone line	0.2936	0.3125
Refrigerator	0.2747	0.1976
Dishwasher	0.1192	0.1557
Vacuum cleaner	0.2893	0.3520
Washing machine	0.2822	0.2123
Car	0.2217	0.2882
Satellite dish	0.2679	0.1589
Solar heater	0.2676	0.2757

Source: MICS 2010/2014; WASH-PD team calculations.
Note: Camps are included in MICS data. LPG = liquified petroleum gas; MICS = Multiple Indicator Cluster Survey.

Table A.2: Consistent Asset Index, MICS 2010 and 2014

	2010		2014		
Quintile	West Bank	Gaza	West Bank	Gaza	Total
Poorest	49	51	37	63	100
2	54	46	44	56	100
3	64	36	60	40	100
4	67	33	72	28	100
Richest	81	19	83	17	100

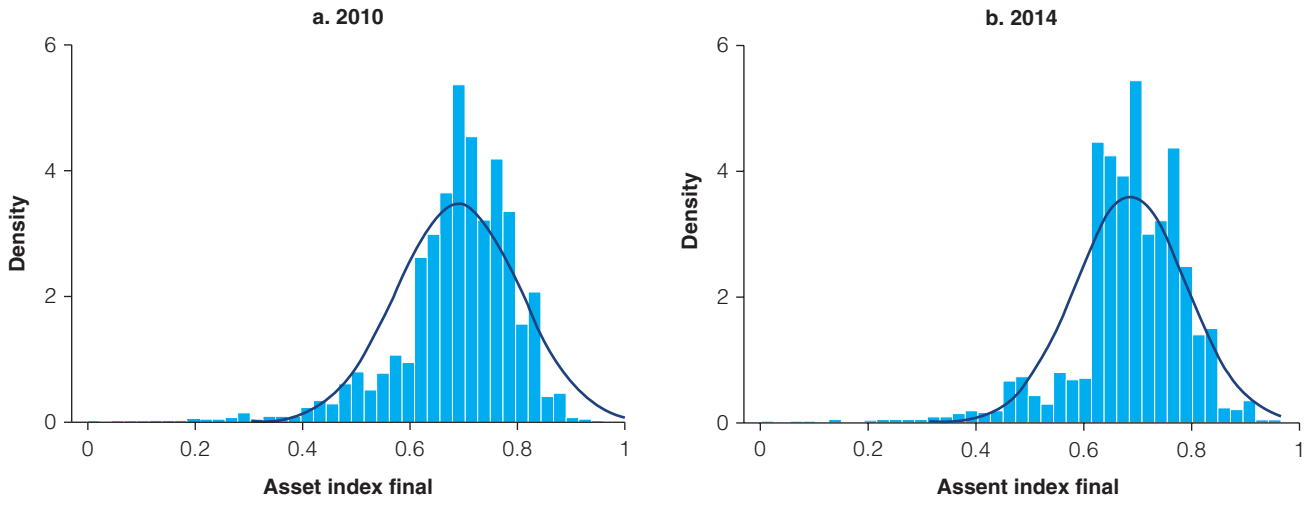
Source: MICS 2010/2014; WASH-PD team calculations.
Note: Camps are included in MICS data. MICS = Multiple Indicator Cluster Survey.

Table A.3: Original Wealth Index, MICS 2010 and 2014

	2010		2014		
Quintile	West Bank	Gaza	West Bank	Gaza	Total
Poorest	52	48	1	99	100
2	52	48	18	82	100
3	62	38	84	16	100
4	69	31	95	5	100
Richest	80	20	98	2	100

Source: MICS 2010/2014; WASH-PD team calculations.
Note: Camps are included in MICS data. MICS = Multiple Indicator Cluster Survey.

Figure A.1: Histogram of Consistent Assets Index Using MICS Data



Source: MICS 2010/2014; WASH-PD team calculations.
Note: Camps are included in MICS data. MICS = Multiple Indicator Cluster Survey.

Table A.4: Ownership of Durable Assets by Consistent Asset Quintiles by Region, 2010, % of Population Unless Otherwise Indicated

	West Bank					Gaza				
Quintile	Poorest	2	3	4	Richest	Poorest	2	3	4	Richest
Rooms per capita (number)	0.4	0.5	0.5	0.6	0.7	0.4	0.5	0.5	0.6	0.7
Computer	14	24	50	75	95	11	22	65	89	97
Sand floor	4	0	0	0	0	1	0	0	0	0
Ceramic floor	52	98	100	100	100	71	99	100	100	100
Cement floor	41	1	0	0	0	27	1	0	0	0
Villa	0	0	0	0	3	0	0	0	0	5
Cook using LPG	88	96	98	98	99	93	98	100	100	100
Cook using wood	6	0	0	0	0	3	0	0	0	0
Radio	35	48	63	70	89	19	34	55	68	91
Phone line	8	12	32	61	91	8	12	36	83	97
Refrigerator	77	99	100	100	100	76	98	100	100	100
Dishwasher	0	0	1	1	12	0	0	0	0	4
Vacuum cleaner	2	7	17	47	89	1	1	3	18	79
Washing machine	72	97	99	100	100	77	99	100	100	100
Car	8	9	20	32	71	2	2	6	14	55
Satellite dish	64	93	98	99	100	70	94	99	100	100
Solar heater	24	43	68	79	95	24	53	74	89	96

Source: MICS 2010; WASH-PD team calculations.
Note: Camps are included in MICS data. LPG = liquefied petroleum gas; MICS = Multiple Indicator Cluster Survey.

Table A.5: Ownership of Durable Assets by Consistent Asset Quintiles by Region, 2014, % of Population Unless Otherwise Indicated

	West Bank					Gaza				
Quintile	Poorest	2	3	4	Richest	Poorest	2	3	4	Richest
Rooms per capita (number)	0.4	0.4	0.4	0.5	0.5	0.3	0.4	0.4	0.4	0.5
Computer	8	14	27	52	89	6	14	33	62	96
Sand floor	0	0	0	0	0	0	0	0	0	0
Ceramic floor	70	99	99	99	100	73	100	100	100	100
Cement floor	29	1	0	0	0	26	0	0	0	0
Villa	0	0	0	0	4	0	0	0	0	4
Cooking using LPG	92	99	99	100	100	82	100	99	100	100
Cooking using wood	4	0	0	0	0	8	0	0	0	0
Radio	21	26	39	62	58	11	13	44	58	57
Phone line	7	9	19	44	85	5	12	37	76	93
Refrigerator	87	97	99	99	100	84	100	100	99	100

table continues next page

Table A.5: Continued

	West Bank					Gaza				
Quintile	Poorest	2	3	4	Richest	Poorest	2	3	4	Richest
Dishwasher	0	0	0	1	12	0	0	0	0	1
Vacuum cleaner	6	4	35	65	92	1	0	15	35	84
Washing machine	85	98	99	100	100	85	99	100	100	100
Car	8	12	28	40	79	2	4	10	16	65
Satellite dish	81	96	98	99	100	88	98	99	100	100
Solar heater	22	43	65	74	93	15	47	69	81	91

Source: MICS 2014; WASH-PD team calculations.
Note: Camps are included in MICS data. LPG = liquefied petroleum gas; MICS = Multiple Indicator Cluster Survey.

To check internal coherency, ownership of durable assets is shown by quintiles constructed using the consistent asset index in 2010 (table A.4) and 2014 (table A.5) and by region. For all items, ownership increased/declined by quintiles consistently in each year and in both the West Bank and Gaza regions.

Note

1. "Access to computer" is not consistently defined across rounds, but it was included in the wealth index as an important determinant of wealth.

Appendix B
Assessing Access of the Poor to WASH Services with PECS 2004, 2009, and 2011 Data

Given the limitations of the Palestinian Expenditure and Consumption Survey (PECS) in measuring access to water supply, sanitation and hygiene (WASH) services and its strength in having a consumption-based welfare aggregate and poverty line, this analysis is limited to the profiles of the poor versus the non-poor and the bottom 40 versus the top 60 percent of population. It does not discuss the results presented in the main text.

As can be seen from table B.1, almost the entire population in West Bank and Gaza reported the public water network as the main water source regardless of welfare status in 2004. However, this access dropped by 10 percentage points in 2009 and had not returned to the 2004 level as of 2011. There is some disparity in access to piped water in the kitchen, in the bathroom, and in the toilet across the income distribution. The lower segments have lower access rates, but these rates have increased over time. Connection rates to the public sewage system are much lower than access rates to the public water network.

Table B.1: Access to Public Water Network and Sewage by Poverty Status and Bottom 40 Status Using PECS Data for 2004, 2009, and 2011

Indicators by poverty status	2004		2009		2011	
	Non-poor	Poor	Non-poor	Poor	Non-poor	Poor
Connected to public network	99.5	98.6	90.7	90.8	92.8	92.7
Piped water in kitchen	97.8	86.1	97.7	93.1	99.0	94.6
Piped water in bathroom	97.8	85.0	97.4	94.1	99.2	95.7
Availability of toilet	99.6	98.0	99.5	98.3	100.0	99.9
Piped water in toilet	97.6	83.5	97.2	94.3	99.3	96.3
Connected to sewage system	54.2	37.9	52.5	54.7	53.8	55.1
Indicators by bottom 40/top 60 status	**Top 60**	**Bottom 40**	**Top 60**	**Bottom 40**	**Top 60**	**Bottom 40**
Connected to public network	99.4	99.0	90.7	90.9	93.0	92.5
Piped water in kitchen	97.7	90.3	98.2	94.4	99.2	96.2
Piped water in bathroom	97.9	89.3	98.0	94.7	99.4	96.9
Availability of toilet	99.5	98.6	99.4	99.0	100.0	99.9
Piped water in toilet	97.6	88.4	97.7	94.8	99.4	97.4
Connected to sewage system	56.3	40.6	52.4	54.0	53.5	54.9

Source: PECS 2004, 2009, and 2011; WASH-PD team calculations.
Note: PECS = Palestinian Expenditure and Consumption Survey.

Appendix C

Appendix C1. Constructing a National Asset Index using LGPA 2016 Data

An asset index using 2016 Local Government Performance Assessment (LGPA) data was constructed using Principal Component Analysis. The estimation of relative wealth is based on the first principal component. A set of assets was selected to be as close as possible to assets in the Multiple Indicator Cluster Survey (MICS) data. The loading matrix for each asset across years is shown in table C1.1. The asset index was normalized to be between zero and one. A histogram of the asset index is shown in figure C1.1. The distribution of scores tends to follow a normal curve in both years without serious issues of clumping or truncation.

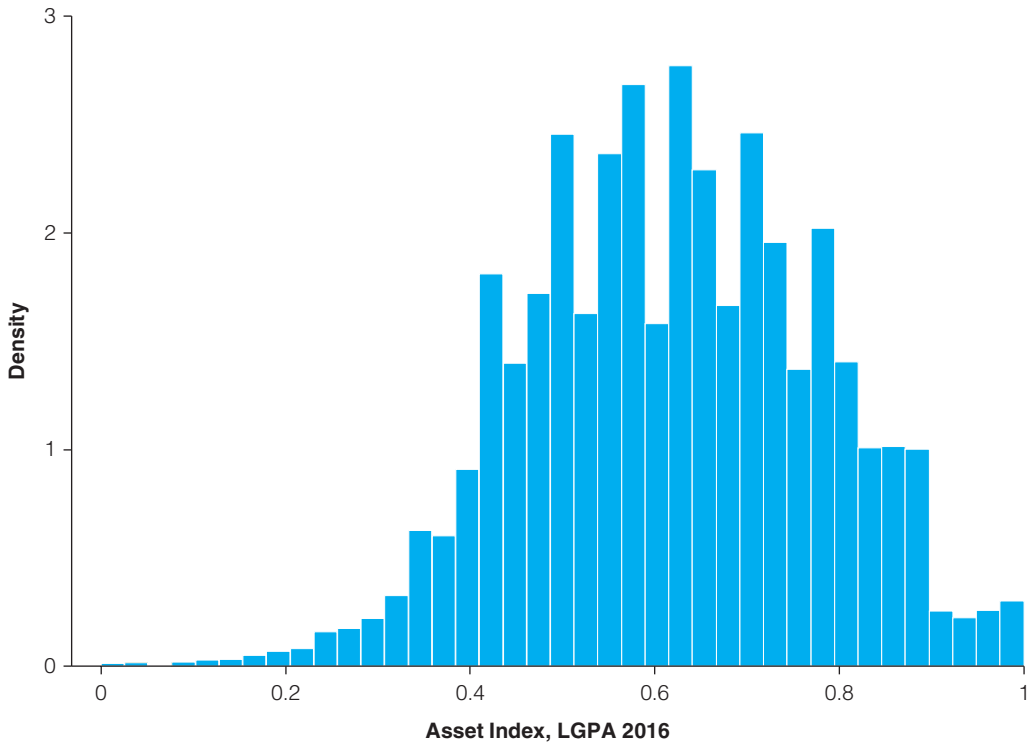
To check internal coherency, ownership of durable assets is shown by region and by quintiles constructed using the asset index in 2016 and by region (table C1.2). For all items, ownership increased/declined by quintiles consistently in each year and in both the West Bank and Gaza regions.

Table C1.1: Scoring Coefficients for the Asset Index Using LGPA 2016 Data

Car	0.3481
Refrigerator	0.1030
Solar water heater	0.2972
Washing machine	0.1397
Dishwasher	0.2158
Vacuum cleaner	0.4027
TV	0.1585
Landline phone	0.3441
Mobile phone	0.2526
Laptop	0.3224
Satellite dish	0.1920
Microwave	0.3701
Radio	0.1531
Household members per bedroom	–0.2074

Source: LGPA 2016.
Note: LGPA = Local Government Performance Assessment.

Figure C1.1: Histogram of Asset Index Using 2016 LGPA Data



Source: LGPA 2016.
Note: LGPA = Local Government Performance Assessment.

Table C1.2: Ownership of Durable Assets by Asset Quintile by Region, 2016, % of population unless otherwise indicated

	West Bank					Gaza				
Quintile	Poorest	2	3	4	Richest	Poorest	2	3	4	Richest
Car	5	15	34	51	85	0	3	21	34	77
Refrigerator	97	99	100	100	100	95	99	99	99	100
Solar water heater	24	55	74	85	95	19	59	78	87	90
Washing machine	87	98	99	100	100	91	100	100	100	100
Dishwasher	1	0	1	1	26	0	0	1	0	2
Vacuum cleaner	3	17	44	74	96	0	3	17	53	99
TV	90	98	99	99	100	88	97	100	99	100
Landline phone	5	12	32	51	84	3	11	45	69	90
Mobile phone	62	87	95	98	99	52	92	99	99	100
Laptop	1	9	24	39	78	4	16	54	69	89
Satellite dish	81	96	98	99	100	78	96	93	99	100
Microwave	4	18	41	67	89	1	3	24	41	92
Radio	15	28	24	46	52	19	50	42	73	77
Household members per bedroom (number)	3.1	2.7	2.4	2.1	1.8	2.9	2.5	2.2	2.1	1.7

Source: LGPA 2016.
Note: LGPA = Local Government Performance Assessment.

Appendix C2. Access to Improved Water and Sanitation in MICS (Including Camps) and LGPA Data

Results from the MICS data in the main text excluded camps to be comparable with LGPA data.

Tables C2.1 and C2.2 and figures C2.1 and C2.2 show access to improved water and sanitation covering the entire population in the Palestinian territories, including camps.

Table C2.1: Population Access to Improved Drinking Water by Region, Area of Residence, and Governorates, 2010, 2014, and 2016, %

	2010 (MICS)	2014 (MICS)	2016 (LGPA)
Total	62	62	57
Regions			
West Bank	88	99	93
Gaza	95	98	1
Area of residence			
Urban	60	58	–
Rural	81	87	–
Camp	47	43	–
Governorates West Bank			
Jenin	72	87	89
Tubas	60	100	99
Tulkarm	100	100	100
Nablus	96	97	98
Qalqilya	99	100	100
Salfit	100	100	100
Ramallah and Al-Bireh	98	99	99
Jericho	90	97	94
Jerusalem	99	100	99
Bethlehem	98	99	97
Hebron	83	96	84
Gaza			
North Gaza	20	17	3
Gaza	8	4	0
Deir al-Balah	4	3	0
Khan Yunis	95	99	1
Rafah	97	100	4

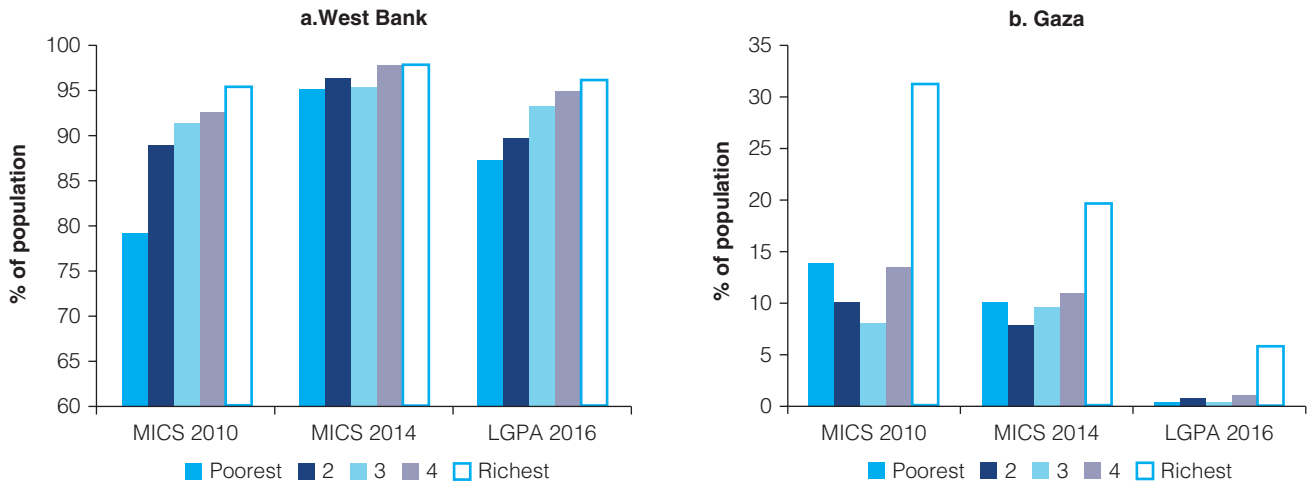
Sources: Data from MICS 2010/2014 and LGPA 2016.
Note: Trends are not comparable across surveys because MICS data includes camps. LGPA = Local Government Performance Assessment; MICS = Multiple Indicator Cluster Survey.

Table C2.2: Population Access to Improved Sanitation by Region, Area of Residence, and Governorates, 2010, 2014, and 2016, %

	2010 (MICS)	2014 (MICS)	2016 (LGPA)
Total	91	99	96
Regions			
West Bank	88	99	94
Gaza	95	98	99
Area of residence			
Urban	91	99	
Rural	88	99	
Camp	92	98	
Governorates			
West Bank			
Jenin	86	98	95
Tubas	78	100	98
Tulkarm	98	99	98
Nablus	97	100	85
Qalqilya	95	100	97
Salfit	67	98	89
Ramallah and Al-Bireh	80	99	94
Jericho	95	96	89
Jerusalem	88	98	91
Bethlehem	91	97	93
Hebron	85	99	98
Gaza			
North Gaza	93	97	99
Gaza	96	98	98
Deir al-Balah	99	99	99
Khan Yunis	95	99	99
Rafah	97	100	99

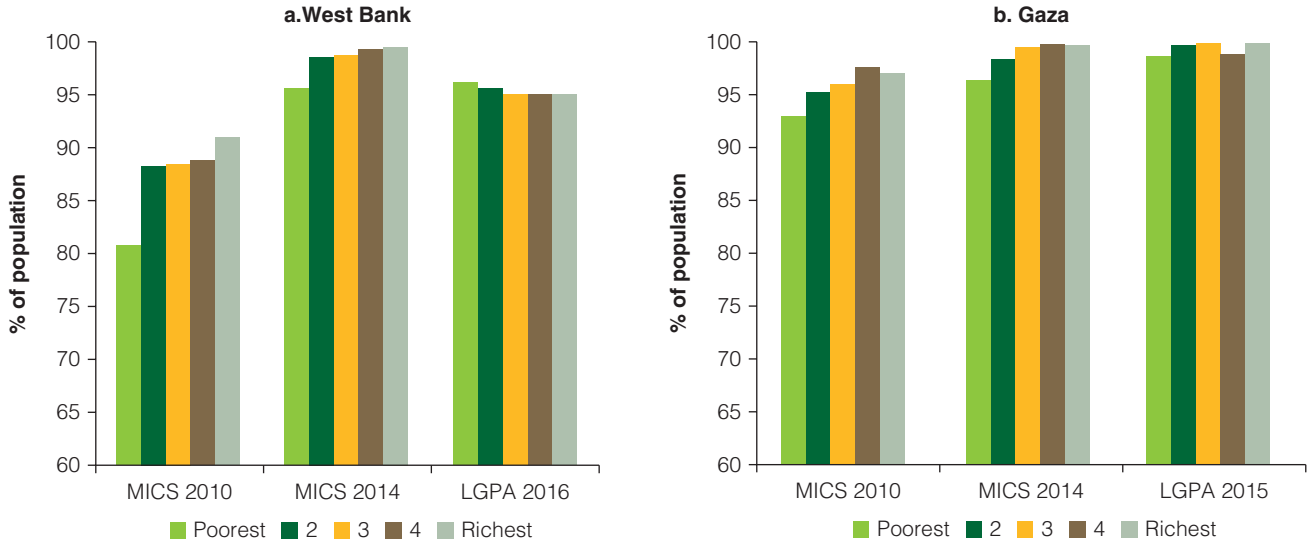
Source: MICS 2010/2014 and LGPA 2016.
Note: Trends are not comparable across surveys because MICS data includes camps. LGPA = Local Government Performance Assessment; MICS = Multiple Indicator Cluster Survey.

Figure C2.1: Trends in Access to Improved Sources of Drinking Water in 2010, 2014, and 2016 by Asset Index Quintiles across Regions, % of population



Source: MICS 2010/2014 and LGPA 2016.
Note: Camps are included in MICS data. LGPA = Local Government Performance Assessment; MICS = Multiple Indicator Cluster Survey.

Figure C2.2: Trends in Access to Improved Unshared Sanitation in 2010, 2014, and 2016 by Asset Index Quintiles across Regions, % of population



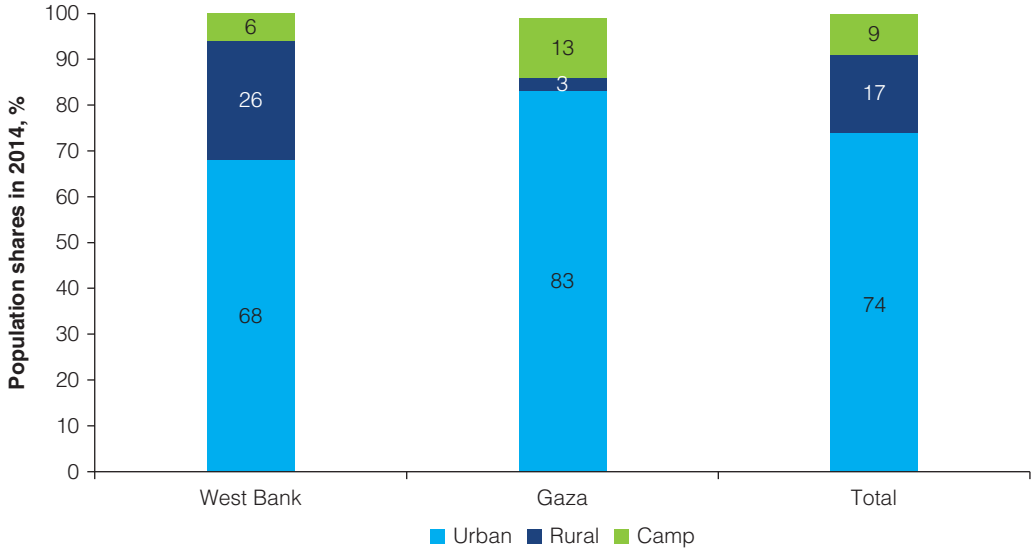
Source: MICS 2010/2014 and LGPA 2016.
Note: Camps are included in MICS data. LGPA = Local Government Performance Assessment; MICS = Multiple Indicator Cluster Survey.

Appendix D
How Rural, Urban, and Camp Areas within West Bank and Gaza Vary in their Access to the Key WASH Indicators

The share of the population in camps varies from 6 percent to 13 percent across the West Bank and Gaza regions, according to the Multiple Indicator Cluster Survey (MICS) data for 2014. The Palestinian territories are highly urbanized, with 74 percent of the population residing in urban areas, 17 percent residing in rural areas, and 9 percent residing in camps (figure D.1). Across regions, these shares vary. Gaza is more urbanized than West Bank and has twice as large a share of the population in camps.

There are no significant differences in access to improved water and improved sanitation across urban and rural areas and camps within the West Bank and Gaza regions. The population in Gaza is universally deprived of improved water, regardless of the place of residence. Figure D.2 shows access to improved drinking water across different areas of residence in the West Bank and Gaza regions. Access to improved water in camps in West Bank is high, and matches the levels in urban and rural areas while in Gaza, it is very low, and comparable to the low levels in urban and rural areas. Access to improved unshared sanitation is universally very high across areas of residence in each of the regions (figure D.3).

Figure D.1: Population Shares by Area of Residence across Regions, 2014, %



Source: MICS 2014 data.
Note: MICS = Multiple Indicator Cluster Survey.

Figure D.2: Access to Improved Drinking Water by Area of Residence across Regions, 2014, % of population

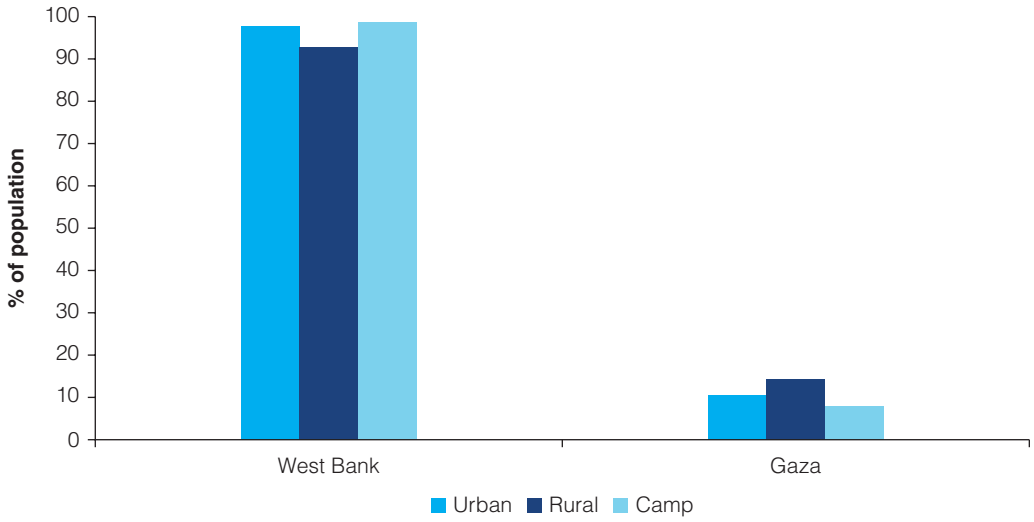
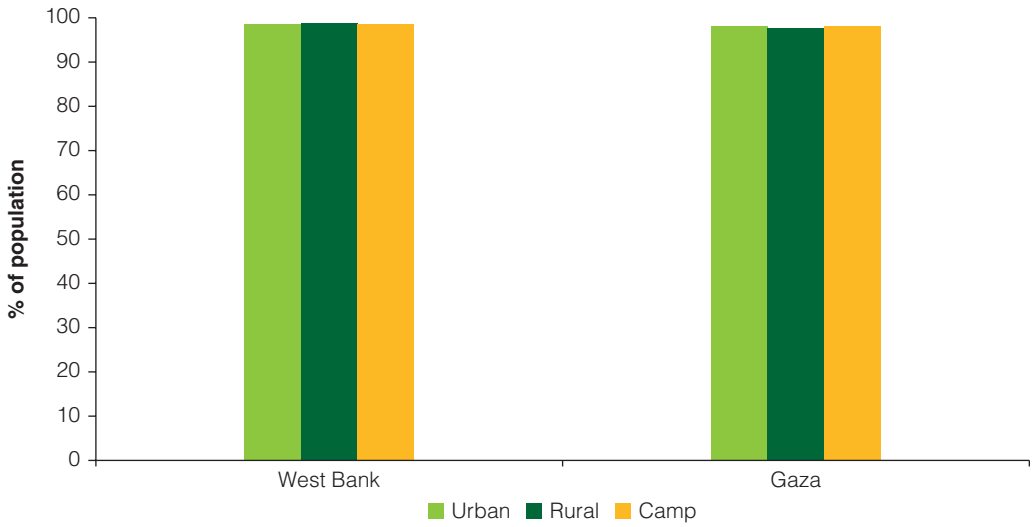


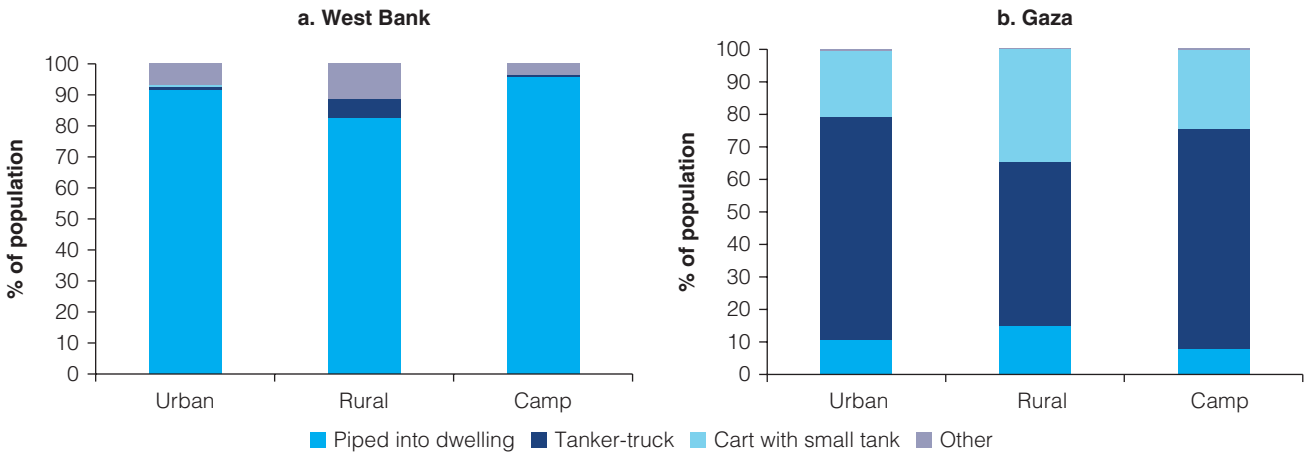
Figure D.3: Access to Improved Sanitation Unshared by Area of Residence across Regions, 2014, % of population



Source: MICS 2014.
Note: MICS = Multiple Indicator Cluster Survey.

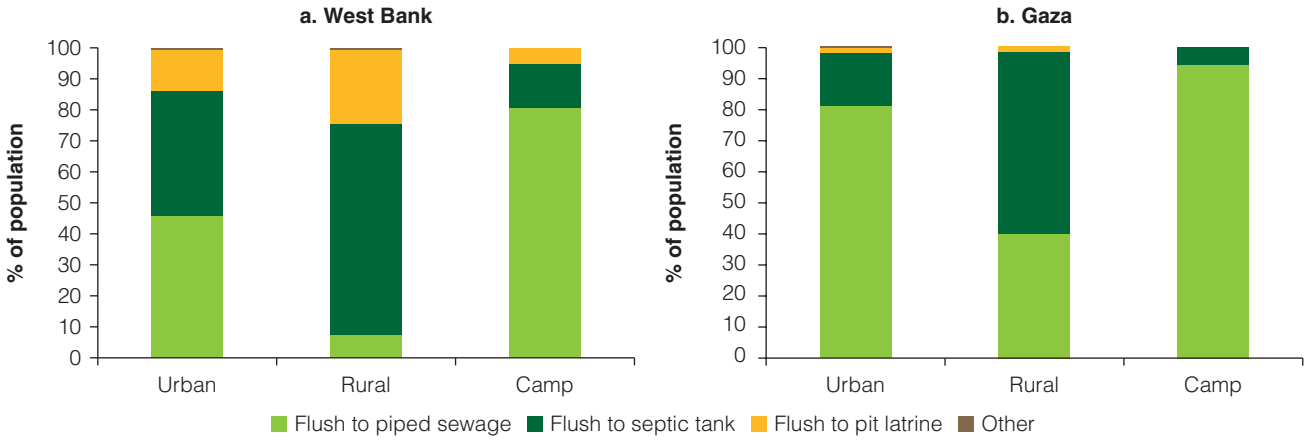
Sources of drinking water do not vary much for the camp and non-camp populations; piped water is the main source in West Bank (figure D.4, panel a), and tankers-trucks and carts are the main source in Gaza (figure D.4, panel b). Consistent with overall high level of access to drinking water, everyone in West Gaza, whether they reside in urban or rural areas or camps, has high access to piped water. In Gaza, nearly all people in all areas use tanker-trucks and carts as the main sources of drinking water.

Figure D.4: Types of Drinking Water by Area of Residence across Regions, 2014, % of population



Source: MICS 2014.
Note: MICS = Multiple Indicator Cluster Survey.

Figure D.5: Types of Sanitation by Area of Residence across Regions, 2014, % of population



Source: MICS 2014.
Note: MICS = Multiple Indicator Cluster Survey.

The rate of connections to piped sewage is higher for the population living in camps, compared to the population living in urban and rural areas. Despite high rates of access to improved sanitation, the types of sanitation are very different across areas within each region (figure D.5, panels a and b). Overall, the population in camps is much better connected to public sewage, while the population in rural areas is more likely to use flush to septic tanks.

Unfortunately, MICS data did not collect information on the quality of water supply and sanitation. This seriously limits the ability to check whether population in camps are deprived or not in terms of the quality and reliability of WASH indicators.

Appendix E
Definitions of Improved Water and Sanitation

Table E.1: Indicators and Definitions of Improved Water and Sanitation

WATER	
Indicators	Definitions
MDG improved water	Includes improved sources of drinking water: "piped water into dwelling," "piped water to yard/plot," "public tap or standpipe," "tubewell or borehole," "protected dug well," "protected spring," "rainwater." Bottled water is considered to be improved only when the household uses an improved source for cooking and personal hygiene. Where this information is not available, "bottled water" is classified on a case-by-case basis. The MICS 2010 and 2014 used in this report contain information about the type of water used for cooking or handwashing, while the LGPA 2016 does not. A decision has been made by the team to group "bottled water" in the LGPA 2016 data as improved.
Basic water	Improved drinking water within 30 minutes' roundtrip from the household.
Improved water on premises	Improved drinking water located in own dwelling or own yard/plot.
Improved water on premises + available when needed	Improved drinking water located in own dwelling or own yard/plot; the drinking water was not unavailable for at least one full day in the past two weeks.
SANITATION	
Indicators	Definitions
Improved sanitation (including shared)	Includes improved sanitation (both shared and unshared): "flush toilet," "piped sewer system," "septic tank," "flush/pour flush to pit latrine," "ventilated improved pit latrine (VIP)," "pit latrine with slab," "composting toilet," and "flush/pour flush to unknown place/not sure/don't know."
MDG improved sanitation (unshared)	Improved sanitation (only unshared).
Flush to sewage	"Flush to piped sewage system."
Open defecation	"No facilities or bush or field."

Source: Compiled using definitions from the WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene.
Note: LGPA = Local Government Performance Assessment; MDG = Millennium Development Goal; MICS = Multiple Indicator Cluster Survey.