



Before the Taps Run Dry

Responding to Gaza's Existential Water Crisis



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on the ground in the Middle East

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The semi-arid Middle East suffers from a chronic scarcity of water. The causes are many: climate change, drought, desertification, urbanization, over-consumption, waste and pollution. Politics also can present special challenges when it comes to accessing and distributing water resources. **In Gaza, many of these issues are present in an extreme form.**

The Gaza Strip is a 25-mile long stretch of coastal land (141 square miles, 365 square kilometers) that is home to a growing population of more than two million people. It includes eight recognized refugee camps that have some of the highest population densities in the world. Years of hostilities and a major blockade have crippled the economy and reduced much of the region to desperate levels of poverty. These conditions are demonstrated most clearly in the inability of the Gazan people to secure reliable access to some of the most basic necessities of human existence — water, sanitation, and power.

With virtually no potable water, severe limitations on available electricity, and raw sewage flowing from the streets to the sea, Gaza's inhabitants do what they can to live normal lives. In Gaza City, one of the oldest continuously inhabited cities in the world, families struggle to maintain their daily routines, even as unsustainable conditions worsen. And, throughout Gaza, it is resilience in the face of despair that most aptly describes the people today.

This report looks at the deteriorating conditions of water, sanitation and wastewater management in Gaza, and the efforts by the Gazan people, together with some international actors, to forestall the further degradation of living standards in the region.



Residents of Gaza face great challenges in managing sewage and accessing clean water. During heavy rains, many neighborhoods in crowded urban areas flood with sewage and undrained rainwater. | Photo by Mohammed Zannoun, Gaza City.

DEPLORABLE CONDITIONS MAKE GAZA PRACTICALLY UNLIVABLE

In 2012, the United Nations published a report entitled “Gaza in 2020: A Livable Place?” The report concluded that, by 2020, without considerable investment in infrastructure and services, the region would lack sufficient schools, hospital beds, electricity, water and sanitation, employment opportunities, and food supplies to provide even a minimally acceptable standard of living for Gaza’s inhabitants.

This is Gaza’s reality today. Regrettably, the necessary support and action did not materialize sufficiently over the course of the following eight years to prevent the predicted deterioration of conditions in Gaza. Since the 2012 report, the population in this confined region has increased by more than 25% (over 400,000 people) to 2.1 million people. And the United Nations Population Fund projects that Gaza’s population will more than double by 2050, to 4.8 million persons. This growing population density will put further pressure on public infrastructure that is already highly inadequate.

Conditions are now so extreme that two-thirds of Gaza’s population live below the poverty line. Unemployment levels exceed 50% – and are considerably higher among younger Gazans. In the face of the blockade, the pandemic and recent hostilities, the number of Gazans permitted to work in Israel has diminished dramatically compared to prior decades. Nearly eight out of ten people in Gaza depend on international assistance to survive. There is food in Gaza, but most people subsist on incomes too low to afford many of the daily essentials.

A June 2022 report by the Office of the UN Special Coordinator for the Middle East Peace Process leaves no doubt that Gazans have managed to survive only by virtue of support from the international community, particularly with respect to their basic infrastructural and service requirements. Critical as this support has been, it provides very few Gazans with a “minimally acceptable standard of living,” and is wholly insufficient for sustainable growth and development, much less the basic human dignity of Gaza’s struggling inhabitants.

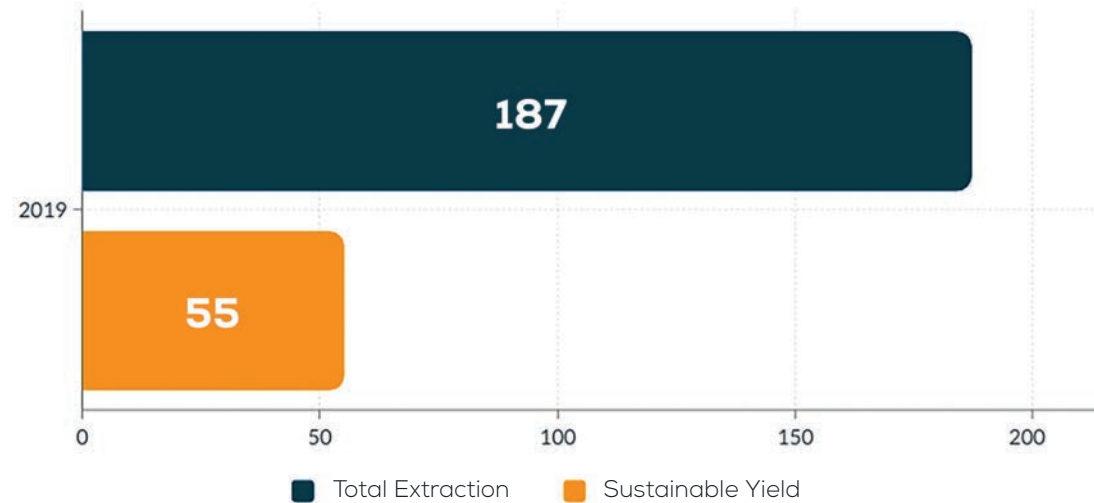
Grave Threats to Water and Sanitation Recognized but Unresolved

The coastal aquifer beneath Gaza, the only natural water source, is unfit for human consumption. Extraction from the aquifer, at 194 million cubic meters of water per year including agricultural wells, considerably exceeds replenishment, which is causing

Water scarcity is an existential crisis for Gaza.

Water is being pumped from the ground faster than it is being replenished through rainfall – at more than three times the renewable rate. **To make matters worse, rainfall in Gaza has been decreasing in recent years.** If Gaza's aquifer is depleted past a certain point, it will become permanently polluted, leaving Gaza with no natural source of water.

Overextraction of the Coastal Aquifer



significant saltwater intrusion. The aquifer is 96% unusable for potable water as a result of contamination by saltwater, uncontrolled pollution, and agricultural chemicals.

At the current extraction rate, the aquifer is at risk of being irreversibly damaged by 2030. Unless dramatic action is taken, salinity will increase rapidly in most areas in the coming years, and the limited availability of fresh and brackish water will decline even more precipitously by 2030, greatly exceeding acceptable chloride concentrations. **Even if pumping were reduced by 50% from current rates, aquifer conditions would improve only slightly.** For the aquifer to remain viable, Gaza’s water systems require an urgent overhaul to reduce consumption from groundwater by more than 70%, to 50 million cubic meters annually.

Data collected by the Palestinian Water Authority in 2022 indicate that the annual supply of safe drinking water in Gaza from all sources is only 21.8 million cubic meters, even as the demand exceeds 130 million cubic meters. So most people in Gaza are forced to buy the bulk of their drinking water from private suppliers at exorbitant rates.

While daily water consumption per capita has, at times, reached as high as 82 liters, this still falls well short of the WHO recommended minimum of 100 liters. UNICEF estimates that less than 10% of the population in Gaza has direct access to clean and safe drinking water. Recently, Gaza has been able to purchase and import additional quantities of water from Mekorot (the Israeli national water company) to expand supply, but this water is frequently mixed with existing ground water, lowering the overall quality.

Just 11 out of 288 authorized water wells are drawing water suitable for drinking.

Only 3.8% of the Palestinian Water Authority’s 288 authorized wells tested within WHO health standards due to salinity, sewage, and chemical runoff into the aquifer. **One-fourth of illnesses in Gaza are waterborne. Cases of cholera, giardia, polio, and viral meningitis reflect growing concerns about the effects of biological and chemical contamination.** Antimicrobial resistance in bacteria exists throughout the water systems in Gaza.

While food insecurity in Gaza has increased sharply, water supplies for agriculture are severely limited; pesticide use is high and chemical runoff further pollutes the aquifer. **The situation particularly impacts children and expectant mothers.** The impact is even greater among women and girls who lack clean water and sanitation for gender-specific needs.

More than 1.1 million Palestinians in Gaza do not receive adequate water and sanitation services. Water supplies are not reaching critical service organizations such as healthcare facilities and schools, much less homes in the dense urban communities that are largely composed of refugees. Gaza’s 25 water and sanitation service providers have faced dramatically reduced access to fuel and equipment necessary to provide acceptable water and sanitation services for the population. These limitations have impacted the operations and maintenance of roughly 500 water and sanitation facilities, including water pumping and distribution, sewage management, desalination and wastewater treatment plant operations.

Infrastructural damage and leakage in water and sewage systems is rampant. As a result, about **43% of the domestic water supply never reaches households.** The Coastal

Less than 10% of the population in Gaza has direct access to clean and safe drinking water.

Drinking Water: A Leading Killer of Children in Gaza

- >> Polluted water is a leading cause of death among children in Gaza.
- >> 26% of illnesses in Gaza are due to dirty water.
- >> Fecal contamination in the water spreads illnesses like chronic diarrhea, giardia, salmonella and typhoid fever, especially in vulnerable populations like the young.
- >> Chronic diarrhea can cause severe malnutrition and stunting, and harm the developing brain.
- >> High nitrate levels in Gaza’s water can cause hypertension, renal failure, and methemoglobinemia.

Sources: Sandy Tolan, "Gaza's drinking water spurs blue baby syndrome, serious illnesses," Al Jazeera, Oct. 29, 2018; Samer Abuzerr, et al., "Microbiological Quality of Drinking Water and Prevalence of Waterborne Diseases in the Gaza Strip, Palestine: A Narrative Review," Journal of Geoscience and Environment Protection, Vol.7 No.4, April 2019.

“I used to wipe the vegetables off with a dry towel before eating them. And we often didn’t even have enough water for the children to wash their hands. My daughters were infected and sick because of polluted water.”

- Niveen’s family and 471 others in Sabra now have a reliable connection to water. Anera upgraded and repaired the water network in Sabra, replacing decayed, undersized steel pipes with new PVC pipes.



Municipalities Water Utility reports that its teams are working under the most challenging conditions to repair and refurbish water wells, water storage tanks, small scale brackish water and seawater desalination plants, water booster stations, wastewater pumping stations, wastewater treatment plants; water, stormwater and sewage collection networks.

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The World Bank reported that **97% of the population now rely on informal and unregulated private water tankers** and small-scale desalination plants for drinking water. Roughly 165 small public and private desalination plants supply water to 370 independent water truckers and to pipes that are connected to local collection points. However, water supplied by vendors is generally unregulated and three to five times the price of the municipal supply. Nevertheless, Gazans often pay such high percentages of modest incomes that drinking

water has become virtually unaffordable in Gaza, despite its low quality. Many Gazans now rely on water from public filling points or unsafe tap water. There are now three operating “short-term, low-volume” desalination plants that produced 3.5 million cubic meters of potable water in 2021, a stop-gap effort while plans for a central desalination plant progress.

The biggest challenge to maintaining and repairing water networks is the shortage or outright absence of materials and equipment because of import delays and restrictions. Israel has deemed much of the equipment to be “dual-use,” with the potential for military purposes. New construction of waterworks facilities, even by international organizations, is equally challenged by the delays and restrictions.

Essential Water Infrastructure Supplies Inaccessible in Gaza

There are thousands of materials barred from entry into Gaza. Some also may not be banned, but require permits that are difficult to obtain. These are a few of the items on that list that relate to Gaza’s water and sewage systems.

Steel pipes larger than 1.5 inches in diameter (vital for high-pressure water flows)

All types of water pumps and motors

Steel fittings, such as valves and sockets

Metal mesh filters

Epoxy

Steel parts exceeding 2.2 mm thick

Electrical generators (for operating water wells)

[Sources: Gisha, “Still Waters” and communications with Anera's water infrastructure engineers]

“We struggled with water scarcity. It pained me when my livestock needed water just as I was running out of it. We would go six days and more without a drop of water.”

- Hanan and her family in Rafah, Gaza relied on tankered water suppliers, but due to her location in a secluded neighborhood, the suppliers rarely showed up.



50,000 residents in the Jeneina, Mashro'a, Barazil and El-Salam areas of Rafah were connected to a reliable source of water. Anera replaced and repaired deteriorated and damaged water networks, reducing water losses and improving the overall water situation and quality of life for Rafah's residents.

FURTHER SETBACKS: THE 2021 BOMBARDMENT AND COVID-19

The May 2021 bombings of Gaza resulted in considerable damage to the region's water and wastewater infrastructure. The United Nations Office for Coordination of Humanitarian Affairs (OCHA) reported that this most recent escalation of hostilities caused widespread destruction of civilian infrastructure. All major areas of water and sanitation infrastructure were impacted at some level, including systems for desalination and provision of drinking water, reservoir storage and pumping, and key wastewater treatment facilities.

According to the World Bank, damage from the May 2021 bombing is estimated at \$10-15 million, spanning 135 locations and 1,500 domestic water connections.

The World Bank's Rapid Damage and Needs Assessment report highlights damage to water pipelines across 135 locations and 1,500 domestic water connections; 30 water wells; three water reservoirs in Gaza City and Rafah City that require structural rehabilitation; and one water pumping station in Khan Younis needing repair. **Water supply per capita decreased by 30% during the conflict.**

The report states further that the main damage to the wastewater infrastructure includes sewage pipelines across 101 locations; five wastewater pumping stations, including the Beit Lahia station, which was completely destroyed and is no longer operational; the Rafah wastewater treatment laboratory, along with partial damage to the solar system used in Gaza wastewater treatment plant. Other infrastructure damage includes stormwater pipelines and infiltration basins. Damage losses are further compounded by loss of revenue from these facilities and supply systems and the costs of operations that now rely on fuel to offset damage to the electric supply systems.

The Palestinian Water Authority and the Coastal Municipalities Water Utility have moved aggressively to provide damage control to these components of the water and wastewater systems. This has been possible with use of existing materials and funding from humanitarian sources. Organizations that have evaluated the conditions, notably the World Bank, the UN and the EU, attest to the fact that measures to date do little more than provide the minimum service capacities throughout the struggling region.

The Palestinian Water Authority and other local authorities, notably the Coastal Municipalities Water Utility, have been working to bridge water demand/supply gaps, but they have faced extreme challenges in the face of the COVID-19 pandemic. The first indications of COVID-19 community spread in Gaza were reported on August 24, 2020. Subsequent measures to control transmission and reduce mortality were severely hampered by the water shortage crisis and its broad implications within the health sector. Availability and access to water and fuel supplies have been limited, and efforts to support water and wastewater infrastructure development sporadic.

As the United Nations OCHA reports, in one example of the impact of the May 2021 hostilities, **the North Gaza Seawater Desalination Plant stopped operating due to a damaged electrical supply line, which affecting 250,000 people's access to drinking water.**

Approximately 160,000 people from Gaza City had limited access to piped water due to increased power cuts. Water pipelines were damaged in several areas, including Gaza City, Tal Al Hawa, and Muntar areas.



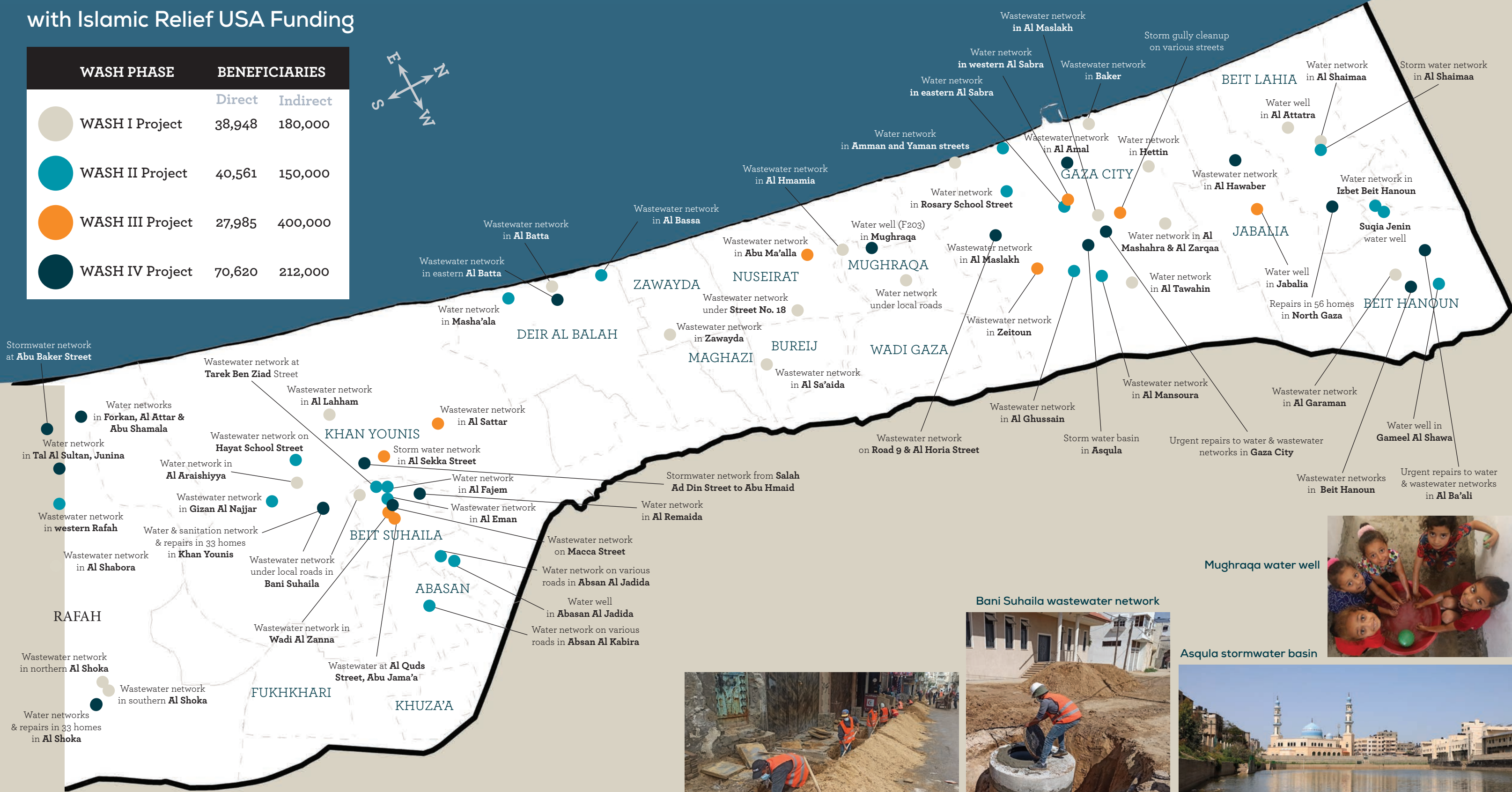
One of the ways Anera is combating Gaza's water crisis is through the installation of reverse osmosis (RO) desalination units at healthcare facilities and other community meeting points. This young girl drinks a cup of safe water from an RO unit installed by Anera at the Baytouna Community Center - meeting the needs of 30,000 residents living in the northern parts of Gaza.

Anera's Water, Sanitation & Hygiene Projects in Gaza

with Islamic Relief USA Funding

This map shows the far reaching extent of the water and sanitation work Anera implements with funding from Islamic Relief USA. Anera repairs deteriorating water networks that no longer work efficiently, minimizing water loss; fixes or replaces water pumping stations at wells that serve whole communities; connects families to reliable water supplies; and repairs rainwater collection basins that replenish the aquifer.

WASH PHASE	BENEFICIARIES	
	Direct	Indirect
WASH I Project	38,948	180,000
WASH II Project	40,561	150,000
WASH III Project	27,985	400,000
WASH IV Project	70,620	212,000



Struggling Towards Progress

The Palestinian Water Authority has developed national strategic plans for the construction, operations and maintenance of water and wastewater infrastructure in Gaza. Among others, **the strategy sets out two goals to reach by 2032 in Gaza: to make available 120 liters per capita per day of potable water and to connect 95% of homes to sewage networks.** Sewage connections will have little meaning, however, unless considerable improvements are made in the central infrastructure, including treatment and reuse. There are now three large wastewater treatment plants that recently began operations, but they are already at capacity or in need of further connections and operations funding. Very little treated wastewater, for instance, is currently reused for agriculture or other uses. **The Palestinian Water Authority's treated wastewater reuse target for Gaza is 50% for irrigation by 2032.**

Pursuant to the national strategy, the Palestinian Water Authority and the Office of the Quartet performed an affordability and willingness-to-pay study in Gaza to address the expectation of a viable tariff system for water and sewage. Actions also included studies aimed at establishment of a national water company and expansion of the Coastal Municipalities Water Utility to serve as a regional water utility for all of Gaza. The Palestinian Authority Cabinet supported these 2021 initiatives with associated bylaws to further strengthen regional water governance.

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Anera's latest water infrastructure improvements in Gaza are designed to prevent flooding and improve stormwater gullies, wastewater networks, water pumps, and water desalination facilities.

Anera's teams of engineers and contracted workers rehabilitated the water well in Mughraqa, in the middle area of Gaza. The upgrade includes the installation of a new, community drinking fountain at the well.

The updated water well improves daily access to clean household water for more than 11,000 people.

The viability of tariff arrangements for water and sewage services throughout Gaza will be dependent on regional economic recovery and confidence-building in the capacity of water and wastewater infrastructure. CMWU and the Gaza City Municipality intend to include a pilot program of new water meters to coincide with rehabilitating existing infrastructure.

Before May 2021, the Palestinian Water Authority made some progress in securing some additional supply of water from Israel, via Mekorot, to key urban areas in Gaza. Unfortunately, delays in construction of connection points in Gaza had hampered this process, which was worsened by damage to water infrastructure sustained in bombings during the conflict with Israel. New connections were only made operational at the end of 2021 in order to facilitate the five million cubic meter annual increase from Mekorot.

Prior to the hostilities of May 2021, water and wastewater infrastructure development saw modest improvement, particularly in securing resources for a new central desalination facility; completion of construction on three large wastewater treatment plants; operations and maintenance funds for the North Gaza Wastewater Treatment Plant; and continued implementation of community-level initiatives to provide short-term solutions.

Some of these improvements were possible because of an Israeli relaxation of restrictions on import of construction materials, more regular opening by Egypt of the Rafah Crossing, and increased availability of electricity, thanks largely to additional fuel purchased by Qatar through Israeli vendors.

“Availability of clean water is so limited for most Gazans...There are many times when we sleep next to our generators awaiting water... People from other areas where water is scarce bring their jerry cans and jugs to fill them at our place...Hunting for water is nothing less than struggling for survival.”

- Saleh, repair shop owner and resident in Gaza City. Anera provided the residents of Saleh neighborhood with new pipes and water delivery infrastructure. They now enjoy access to water around the clock.

Strategic objectives set by the Palestinian Water Authority include:

Introducing bulk seawater desalination,

Completing the North-South Water Carrier to distribute water from the desalination plant to customers,

Expanding the North Gaza Emergency Sewage Treatment project,

Increasing local connections to the Khan Younis wastewater facility, and

Developing the water management infrastructure into one regional system in Gaza for efficiency and commercial viability.



Nevertheless, the overall capacity for electricity production has remained largely unchanged for nearly a decade despite increased demand. Any large-scale plans to construct and operate major desalination plants, wastewater management facilities, power grids, and associated networks remain dependent on regional cooperation and considerable international support. **Most importantly, existing facilities are often limited in their ability to achieve full operational capacity due to lack of operations and maintenance funding.**

Some donors have made significant pledges of support for projects that are absolutely essential to Gaza's self-sufficiency in water, sewage, and power management. Desalination is the most viable source of freshwater in Gaza's future and donor support is absolutely critical. In addition to support for the existing short-term, low-volume facilities, there has been slow progress in the implementation of the Gaza Central Desalination Plant and Associated Works program, designed to provide 55 million cubic meters per year of potable water to the region. Eventually, plans call for the plant to double that capacity, producing 110 million cubic meters of water annually, an amount that would allow it to become overwhelmingly the most significant source of water in Gaza and go a long way towards meeting the needs of Gazans. Donor financial commitments need to be finalized and assurances from Israel are still required for the entry of construction materials and equipment, as well as for construction operations offshore.

Desalination is the most viable source of freshwater in Gaza's future and donor support is absolutely critical.

Energy: A Key to Improving the Water Supply

Gaza suffers from a chronic electricity deficit, which affects nearly every aspect of life in the territory. In 2021, power was available for 13 hours a day on average. While 500 megawatts of energy are needed on average to meet the daily needs of residents, only 185 megawatts are available. Electricity shortages hamper the operations of local water and sanitation facilities, desalination plants, sewage pumping stations, and wastewater treatment facilities. Roughly 108,000 cubic meters of untreated sewage flows into the Mediterranean Sea every day as a result.

Gaza's residents need an average of 500 megawatts of energy to meet their daily needs, but only 185 megawatts are available.

The Palestinian Energy Resources Authority's master plan for electricity generation and transmission in Gaza calls for connections to Egypt and Israel at 220kV and 161kV respectively, as well as increased renewable energy production within Gaza. These high voltage supplies would have a significant and positive impact on the availability and tariff structure of electricity in Gaza, but they have not yet moved forward due to technical and administrative challenges. The Office of the Quartet is conducting further studies to get proposals for addressing the issues.

At the same time, both the Palestinian Authority and the Government of Israel have progressed in designs for the improved supply of natural gas to Gaza. The United Nations Office for Coordination of Humanitarian Affairs reports that, in January 2021, the EU announced that it will provide up to 20 million euros to fund pipeline infrastructure in Gaza. The report notes as well that the Qatari government has also committed to providing \$60 million toward the cost of the project.

With nearly 350 days of sunshine each year, Gaza is expanding a growing number of household and community-based solar energy platforms as a viable source of energy, given the unpredictability of grid-based electricity supply. Small-scale solar energy systems are providing households with enough energy to power water supplies and critical appliances, including some air conditioning. Solar energy is also supporting some community and regional desalination facilities and serving the needs of local schools and health care facilities.

"These solar-powered reverse osmosis systems are a quick and effective solution to the problem of accessing potable water. They are easy to make and to install. A company in Gaza City manufactures them. It's an impressive, high tech facility and they have in stock all of the materials they need to to produce the systems."

– Sami Mater, an Anera engineer and project coordinator in Gaza.



Neighborhood children get water at the Friends Benevolent Society water fountain in Gaza City, supplied by a reverse osmosis unit Anera installed.

In one example of Gaza's hope for increased energy self-sufficiency, the Palestinian Ministry of National Economy signed an agreement with the private Palestinian Development and Investment Co. to construct a solar facility capable of generating seven megawatts of electricity in Gaza Industrial City, the industrial zone adjacent to al-Montar that lies east of Gaza City near the defacto border with Israel. It is designed to be the largest solar energy project in Palestine, with more than 21,000 solar cells installed on an area of approximately 64,000 square meters, providing energy for both regional commercial and household needs. Unfortunately, the May 2021 hostilities resulted in considerable damage to the new facility and its anticipated operations. It is unclear when it will become fully operational.

The Value of Community-level Projects

Large-scale advancements, while critically important, generally take longer to complete. Given the immediate and dire needs of the Gazan people, interim solutions are also an urgent imperative. **Non-governmental organizations like Anera have been hard at work in Gazan communities installing, operating, and maintaining smaller-scale water and wastewater infrastructure** to meet existing needs and bridge the gap until large-scale projects become functional.

Projects such as community water reservoirs, small-scale desalination plants, and local public-private water distribution systems can transform the lives of Gazans and without conflicting with the region's hopes and plans for comprehensive water infrastructure development and expanded grid-based power supply, as outlined by the Palestinian Water Authority.

But more such efforts are needed. Community-level projects provide critical services and will offer valuable redundancies in the future, if inconsistent supply persists at the central level.

Community-Level Projects that Meet Immediate Needs

- ▶ Underground tunnel systems for transporting sewage away from houses and pumping it to treatment facilities for treatment
- ▶ Upgraded municipal water wells to improve water pressure in the system and for end users, including in people's homes
- ▶ Reverse osmosis water purifiers and chlorine units at health and community centers, schools and other vital spaces to provide potable piped water
- ▶ Solar panels to run wells and reverse osmosis systems so they can function during power cuts from the electricity grid
- ▶ Culverts, manholes, and stormwater gullies to carry water away from streets, homes and businesses to basins that store the runoff and replenish the aquifer

IMMEDIATE ACTIONS REQUIRED

As intensified water usage and climate change dry the Middle East's water resources, cross-border cooperation is more critical than ever to ensure potable water access for growing populations. In Gaza, water and sanitation systems are in crisis. Governments and international civil society must work closely with local authorities to change the direction of the downward spiral. Collective action is the only hope to relieve stress on the Gaza coastal aquifer and secure water reserves for future generations.

To meet the needs of its population, Gaza must substantially increase its supply of potable water. Wastewater treatment and rainwater capture infrastructure must be substantially augmented to replenish the aquifer.

Sustainable solutions to the oppressive conditions in Gaza will require new approaches to governance, cooperation, and the application of resources in the region. Challenges exist on all of these fronts. The extent of global attention to these conditions falls far short of the gravity of the crisis.

Local authorities and the global community must combine efforts to bridge the gap between the water supply and demand through improved facilities for desalination, water storage, transmission, and wastewater management and reuse.

While international investment in major water infrastructure is critical, any such projects will have little long-term viability without Palestinian ability to freely import the equipment and supplies necessary for the construction and maintenance of water and sewage systems. As long as the existing bureaucracy of delays and denials prevails, Gaza's water infrastructure will be inadequate to meet public needs.

As long as the existing bureaucracy of delays and denials prevails, Gaza's water infrastructure won't meet public needs.

The urgent need for potable and domestic water will require parallel approaches to build out large-scale desalination and while simultaneously undertaking immediate, critical interventions. The rapid timeframe requires a push for both community level projects and cross border cooperation to increase water imports. Every effort is required to repair and strengthen infrastructure and distribution networks. The quality of water supplies must be improved (and monitored) in order to mitigate anticipated health crises. Small-scale, community-level projects for water supply and distribution, solar-powered wherever possible, will play a valuable role in near-term support and longer-term backup, as needed.

Securing reliable and consistent levels of electricity is critical to maintain a functioning infrastructure for water and wastewater management. This includes progress in securing and providing a reliable supply of natural gas. Provision of high-

voltage electricity from Israel and Egypt is equally critical.

In the longer-term, the region will be increasingly dependent upon expanded desalination facilities as the most viable sources of freshwater. These steps will require sustained commitment from the global community for needed financial and technical support. Gaza will likely have to buy more water from Israel to meet its needs for some years, until large-scale desalination facilities are fully operational.

To achieve these necessary measures, Gaza will require additional relief from Israeli restrictions in access and movement of goods into Gaza, including materials for repairs and construction of electricity, water and wastewater infrastructure. Similar cooperation with Egypt will be required. Moreover, Gaza will need to work with its neighbors to secure a reliable supply of electricity to enable operation at full capacity. Palestinian authorities must agree to coordinate on steps to restore and improve infrastructure. The PWA will need to enforce measures for governance of water and wastewater projects, encouraging public private partnerships, where possible.

Dire water conditions and the onset of the COVID pandemic are stark reminders that the availability of water, sanitation and hygiene services will be the best hope to forestall the spread of disease and promote better public health. More broadly, the despoliation of Gaza's aquifer and sole natural source of water poses a threat to the long-term viability of society in the territory. It is essential that we prioritize improvements in these services in homes and public settings throughout Gaza.

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Endnotes

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Harnessing the Power of the Sun to Provide Water

In Gaza, solar energy provides a sustainable, renewable, plentiful and environmentally safe power source. Anera installs solar panels to run wells, irrigation networks, and reverse osmosis systems at healthcare facilities, schools, community centers and family farms.

PHOTO: an irrigation system that is powered by these solar panels that Anera installed

anera.org/water

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ABOUT ANERA'S ON-THE-GROUND SERIES

The Anera on-the-ground series is designed to add a humanitarian voice to the story of life in the Middle East. With data from Anera's professional staff, people who live and work in the communities they serve, and with over 50 years of experience in the region, Anera has a unique opportunity to build a fuller understanding of what life is like for families struggling to survive within an atmosphere of severe political strife and daily turmoil.