United Nations Development Programme

PROJECT CONCEPT NOTE

[State of Palestine]

Project Title: Establishing an Online Monitoring System for Bulk Water Supply and Distribution in the West Bank

Project Number:
Implementing Partner: Palestinian Water Authority (PWA)

Start Date: 1 November 2022 **End Date: 31 December 2024** **PAC**
Meeting Date:

Brief Description
The bulk water supply and distribution system in the West Bank face significant challenges, including shortage of water supply, which consequently has a negative impact on access to sufficient, safe and affordable water for Palestinian communities, households and individuals in the West Bank. Against this backdrop of the constant water shortage affecting Palestinian communities in the West Bank, and in line with the national water sector reform plan, UNDP – in partnership with the Palestinian Water Authority (PWA) and the West Bank Water Department (WBWD) – intends to enhance the management of Bulk water distribution in West Bank, reduce the non-revenue water through improving water supply monitoring system and exploring additional water resources. This project will support the establishment of an effective and efficient online monitoring system for bulk water supply in the West Bank, along with developing the institutional set-up and capacities needed to ensure accurate real-time monitoring of water flow and to promptly respond to any water leakage that may emerge. In addition, the project will support the drilling of a groundwater well in As-Samoua' with expected capacity of 150-250 m3/hr (3000-4000 m3/day) to address the critical shortage of water supply in the surrounding communities. The project will go through an inception phase from October 2022 to March 2023 in which the capacity assessment of WBWD will be conducted and the capacity development plan developed based on the findings. These will inform the final project document with clear milestones and targets to be finalized in March 2023.

Contributing Outcome (UNSDCF, CPD, RPD):
UNSDCF: Outcome 3: Palestinians, including the most vulnerable, have equal access to sustainable, inclusive, quality social services, social protection, and affordable utilities/
UNSDCF output 3.3: Improved sustainable and equitable access to safe drinking water and safely managed sanitation services, including solid waste management.
PPF/CPD: CPD Outcome 4 Leaving no one behind: Social Development and Protection; Output 4.2 Improved and equitable access to quality water services to people ensured
Indicative Output(s) with gender marker[1]:
Output 1.1: An affordable and sustainable solution for online monitoring of bulk water supply and distribution developed, piloted and operationalized in prioritized locations across the West Bank (GEN2)
Output 2: Groundwater well constructed and ready to be utilized for water supply in vulnerable communities in the West Bank (GEN1)

Total resources required:		**$ 2,143,346.3**
Total resources allocated:		
	UNDP TRAC:	**15,000**
	Donor:	**$ 2,128,346.3**
	Government:	
	In-Kind:	
Unfunded:		

[1] The Gender Marker measures how much a project invests in gender equality and women's empowerment. Select one for each output: GEN3 (Gender equality as a principle objective); GEN2 (Gender equality as a significant objective); GEN1 (Limited contribution to gender equality); GEN0 (No contribution to gender quality)

Agreed by (signatures)[2]:

Government	UNDP	Implementing Partner
Print Name:	Print Name:	Print Name:
Date:	Date:	Date:

[2] Note: Adjust signatures as needed

I. DEVELOPMENT CHALLENGE

Water is an indispensable resource to sustain life and health, and to ensure decent and dignified living conditions for all. The right to water entitles everyone to have access to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic use. Yet in the West Bank, water supply and distribution face significant challenges, including on account of the protracted occupation. This consequently has a negative impact on access to water for Palestinian communities, households and individuals in the West Bank.

Under the 1995 Interim Agreement (Oslo II), Israel retained control of all water resources in the occupied Palestinian territories, the Palestinian utilization in 1995 was 118 Mcm and they have to increase their utilization by an additional 78 Mcm during by year 2000 (in total 196 Mcm). The 118 represents 17.3% of the agreed aquifer yields. Currently, the total utilization is around 132 MCM in year 2021 (107 MCM/yr from wells and 25 Mcm from springs) still utilizes 67.3% from what was agreed on in 2000. About 49% of the pumped/discharged water is used for public and industrial purposes (65Mcm), while the total demand in 2021 was estimated at 178 Mcm. PWA purchased 77.6 Mcm from Mekorot (6.6Mcm of which for agricultural use). This means that, the total available water for public use was 136 Mcm, which represents 76.4% of the public demand. Of course, the public demand is increasing every year, while the Palestinian utilization from groundwater remains constant at best, or could be decreased at worst due to climate change.

WBWD purchases water from Mekorot and Jiehon Israeli companies through 121 connections (113 from Mekorot and 8 from Jiehon), distributed all over the West Bank. In addition, Mekorot has 55 connections located in the same water network supply to the Israeli settlements in the West Bank (i.e. Deduction connections), where Mekorot deducts the total supply quantities + 4% from the water has been supplied from the 113 Mekorot connections mentioned above. WBWD produces water from 20 local wells. These connections and wells supply 280 service providers. Moreover, the total Non-Revenue Water (NRW) on the bulk system is in the range of 10-13%. The average bulk water supply (at the water meter of the WSPs) amounts to 107 l/c/d. However, taking into consideration the NRW at community level where losses amount to 30% results in people receiving an average of 71 l/c/d.

Based on Palestinian Water Authority (PWA) figures, in 2018 the average water consumption for domestic, commercial and industrial uses (excluding agriculture and accounting for leakage) in the West Bank was 82 litres per capita a day. This falls below the minimum daily per capita water consumption levels recommended by the World Health Organization, which is 100 litres of water per capita a day for personal and domestic use only. Moreover, according to the Water Sector Regulatory Council, in 2020 only nine service providers in the West Bank[3] were able to deliver the WHO recommended minimum levels of daily per capita water consumption. Thus, Palestinians in the West Bank face a constant and largely man-made shortage of water.

For Southern Hebron Governorate, all water service providers of ,mainly, As Samoua', Ad Dahiriya and Yatta with total population of more than 260,000 inhabitants (PWA 2022) suffer from a severe shortage of water supply. Their water supply is mainly limited to the quantities of water supplied from the Halhul Reservoir, to the north of Hebron City, two days a week, in addition to the supply quantities through small Israeli connections. According to PWA calculations, the demand at bulk level is estimated at 39,000 m3/day in 2022, while the total supply at bulk level does not exceed 14,000 m3/day (~53 l/c/d) as an average rate during the year, meaning that people received less during summer months.

The existing supply sources from local and purchased sources do not have the capacity to supply more water and since the demand is high, PWA has planned, through the Joint Water committee, to develop three groundwater wells in the south of Hebron Governorate, in addition to establish a new Mekorot connection point to the south of As Samou'. Consequently, PWA managed to get approval for drilling one groundwater well (out of the three suggested wells) with

[3] The nine localities in the West Bank were minimum WHO recommended levels of daily per capita water consumption were met are the following: Al-Auja, Arraba, Attil, Baqa al-Sharqiya, Jericho, Barta'a,Qalqiliya, Salfit, and Zeita.

expected capacity of 150-250 m3/hr (3000-4000 m3/day) and establish main Mekorot connection point with potential capacity of 1950 m3/hr (38000 m3/day). However, according to the Israeli side, Mekorot connection will not be ready to supply water before 2028. Consequently, PWA sees that the development of groundwater well (drilling, testing and equipping) is the fastest action that could contribute to improving the supplied water quantities and increasing the consumption rates in the area, until the establishment of the new connection in 2028

Moreover, and within the water sector reform plan, the PWA is working to improve the performance of the WBWD. This entails a) reducing the non-revenue of water at bulk level, including limiting the illegal connections on the main water supply pipelines in the West Bank and promptly detecting leakages, and b) achieving equitable water distribution among all water service providers,[4] which entails increased capacity for water supply and new connection points.

In 2019, the Cabinet of Ministers of the Palestinian Authority (PA), endorsed an Action Plan for Reform program of institutional and legislative reform in the Palestinian water sector. The goal is to establish and activate an effective water governance system and improve the water management systems. A key step in the reform process was the endorsement of the new Water Law through a presidential decree. The Water Law establishes mandates and responsibilities of key sectoral institutions, including the National Water Company (NWC) – which is currently named West Bank Water Department (WBWD). Accordingly, PWA shall rehabilitate and develop the West Bank Water Department (WBWD) and establish the NWC to provide bulk water at the national level, to all governorates through a transitional phase.

A Road Map to rehabilitate and develop the WBWD and to establish the NWC was completed after analysis of the current WBWD – including its legal status, organizational, financial and commercial aspects, with attention to the internal and external constraints (Israeli Occupation, municipality capacities, specific to the development of WBWD) According to the study, priorities for the successful establishment of NWC are:

- Enhancing cost-recovery and financial viability in the short-term
- Improving service provision between the WBWD and customers
- Increasing bulk water supply to respond to growing demand
- Improving the performance of the WBWD to make the organization cost-efficient and cost-effective

During the last few years, in view to enhance efficiency of WBWD – including reduction of NRW at bulk level - PWA has implemented the following measures:

- Develop Water Supply and Distribution Information System (WSDIS) to support the management and monitoring of water supply and distribution at bulk level
- Upgrading billing system over web including reviewing all generated reports and adding others to provide PWA and WBWD full overview of the supply, distribution and NRW quantities as well as the collection rates and debits.
- Develop mobile application with meter barcodes to facilitate reading meters and automatically download reading the billing database.
- Analyze actual price of water at bulk level for the water department and establish a policy for financial sustainability
- Study the feasibility of ensuring some mechanical and electrical parts at bulk level to increase the operation and maintenance efficiency

[4] Based on the Law by Decree on Water No. 14 of 2014, service providers encompass the

"National Water Company and regional water facilities, including local government units, joint councils, and associations which provide water or sanitation services." Source: Water Sector Regulatory Council (WSRC). Performance Monitoring Report for water and wastewater providers in Palestine 2020.

- Define needs to rehabilitate and install monitoring meters at transmission main to define losses at local government level and Mekorot lines
- Drafting provisional regulation for rehabilitating and developing the WBWD and establishing the NWC
- Increasing collection efficiency from 47% in 2014 to 68% in 2016 upon close follow-up and procedures to reduce debts
- Conduct a comprehensive field assessment of all WBWD's meters (around 400 meters including around 100 electromagnetic meters) in order to determine the current status of these meters, the maintenance needs in terms of hardware, infrastructure, communication, manhole environment and all other related issues, and define needs for improved bulk management.

Currently, the WBWD has more than 700 measuring points (meters) with different diameters and pressure rates distributed all over the West Bank. **A total of 500 meters are invoiced meters that measure the water supply quantities for around 280 service providers.** The remaining meters measure the flows at local sources (wells) and/or the inlet/outlet of regional reservoirs. It is worth mentioning that, there are around 150 meters/connections that belong to Mekorot. These connections/meters are not accessible by WBWD or PWA, and thus supplied quantities of water cannot be monitored except in some locations where WBWD may install a new monitoring meter. With regards to the current water supply monitoring system, at the beginning of each month WBWD's operators are sent out to read the 700 meters across the West Bank, and then enter manually these readings to the billing system. Subsequently, a big team from WBWD starts to work in data validation, estimate the missing readings (damaged meters), enter the Mekorot invoice and eventually generate the final invoices. This whole process – which is time-consuming and requiring significant human resources and costs - takes almost one month, before the final invoices are ready and sent to the service providers.

An ongoing assessment undertaken by UNDP/PAPP with an external technical expert provides valuable insights on the status of the Supervisory Control and Data Acquisition (SCADA) System installed at the West Bank Water Department (WBWD). The system, which was installed during 2011-2014 with USAID support, was originally intended to ensure not only the remote, online of water supplies (incl. stations/wells, water pumps and meters), but also to enable remote control of the targeted water supplies. However, due to changes in US politics and development aid policies, the implementation of the SCADA system was put on hold and the remote control of water supplies never materialized. The first stage of USAID project included interfacing and monitoring of 58 water stations and meters, out of about 588 stations/meters. However, the SCADA monitoring features vary for these targeted sites, with only 4 sites currently having full water flow monitoring. Moreover, the SCADA system is associated with high costs in terms of installation and maintenance, requires upgrade of servers, and building capacities of WBWD staff to ensure adequate management and maintenance. In addition, the SCADA system does not have full coverage of water supply and distribution in the West Bank as it is currently implemented and fully functional only in a limited number of locations.

Against this backdrop, there is a clear entry point for exploring alternative local solutions – that are feasible, affordable and sustainable – to be applied to other locations across the West Bank not covered by any online water monitoring system. There is a desperate need and a significant potential for improving the national system and capacities for effective and efficient remote monitoring of water supply and distribution in the West Bank, including relevant linkages and support to the billing system. Relevant solutions enabling the efficient and sustainable real-time monitoring of water supply and distribution in the West Bank would inform and strengthen PWA's and WBWD's capacity to promptly address water distribution issues (e.g., water leakages), thus contributing to reduce water losses. Moreover, improvements in the national system and capacities for water supply and distribution monitoring would also contribute to reducing the operational costs related to the current billing system (WSDIS), thus improving its efficiency and financial sustainability.

While measures to improve the efficiency and effectiveness of water supply monitoring system are to be sought, there is a critical need to enhance the skills of women and increase the number of employment opportunities for women in

this sector. Women are underrepresented across the water sector. They do not exceed 8 percent of employees in water provision utilities, and 32 percent in ministries and authorities, none of which are decision-making or leadership positions[5].

II. STRATEGY

Over the years, UNDP/PAPP has contributed to the development of the water sector in the State of Palestine, while supporting and enhancing the capacities of relevant Palestinian institutions across national and local levels. In doing so, UNDP/PAPP's support to the water sector has contributed to increased communities' access to water, reusable wastewater, energy and better solid waste services in the West Bank and Gaza Strip.

Against the backdrop of the constant water shortage affecting Palestinian communities in the West Bank, and in line with the national water sector reform plan, UNDP – in partnership with the PWA - intends to support and contribute to national efforts towards improving the effectiveness and efficiency of WBWD and increase highly vulnerable communities access to water. In particular, this project aims to support:

a) The establishment of an effective and efficient online monitoring system for bulk water supply and distribution in the West Bank, building on previous experience in online monitoring of transboundary wastewater and using feasible, affordable and sustainable digital solution. In this, the project also aims to promote an enabling institutional set-up and strengthen technical capacities needed to ensure accurate real-time monitoring of water flows and to promptly respond to any water leaks, linking the collected data to WBWD's billing system.
b) The finalization of phase 1 in PWA's response plan of enhancing the water supply in the South of the West Bank as the planned Mekorot connection will be ready to supply water in 2028. The first phase consists of drilling a groundwater well in As Samoua with casing, conducting pumping tests, equipping the well and install the booster station and pipeline from the well to the existing As Samou' reservoir. The first phase is urgently needed and is complementary to the second phase funded by the World Bank.

Online Monitoring System for bulk water supply

The Palestinian Authority requires targeted support to identify and invest in strategic pathways in line with the State of Palestine's Nationally Determined Contribution (NDC). The proposed project, thus, will contribute to the State of Palestine's implementation plan for the water sector through "Non-revenue water is reduced by 15% by 2032", as stated in the State of Palestine's First Nationally Determined Contributions (NDCs) "Updated Submission" October 2021.

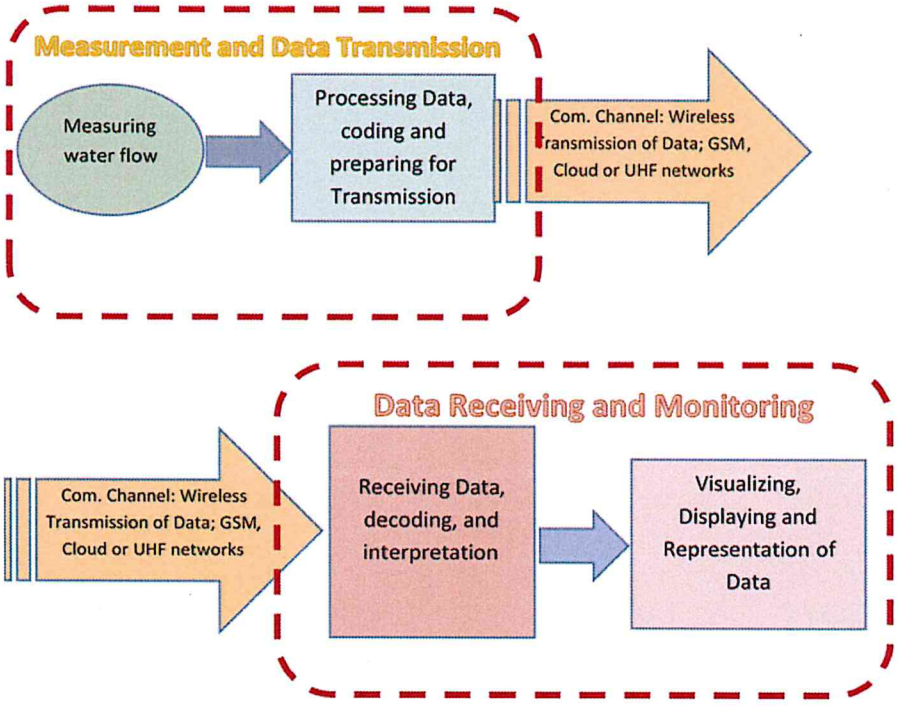
Establishing an online monitoring system for bulk water supply and distribution in the West Bank will support the PWA in achieving the following objectives:

- To provide real time-data regarding the flow rate, pressure, and losses at specific routes of the bulk water supply system. Data will be accessible by the field engineers, water distribution managers and other related staff via their computers or mobile phones. This will enable quick actions and immediate responses when problems regarding the water supply emerge and reducing NRW at bulk level.
- To link the monitoring system with the Billing and Water Supply and Distribution Information System (WSDIS). This will reduce both the financial and human resources efforts and the time needed to generate the invoices to the service providers. It will, also, help PWA and WBWD to quickly define the water supply related problems and solve it immediately
- To reduce the cost of installation of electromagnetic meters. In this project and based on the local experience, mechanical meters will be used to transfer data automatically using the available data transfer technology.

[5] Palestinian Water Authority, *Water Governance in Palestine Sector Reform National Report*, 2015

This project will build upon the good practices and lessons learnt from the successful installation of an online monitoring system for wastewater flow in six locations across the West Bank, which was implemented by UNDP and funded by the Government of Netherlands. The PWA perceives a good opportunity to apply the same technology on water supply and distribution systems in the West Bank to ensure real-time monitoring of the water supply quantities from local and purchased sources, as well as the water quantities delivered to service providers. Accordingly, the PWA implemented a pilot project in Kefel Hars and established on-line monitoring system for water supply to test the performance of the overall system. The results reflected high performance of the online monitoring system, which can monitor both flow and pressure at delivery point. Key results of this pilot are demonstrated in the annexed report.

The following diagram summarizes the proposed approach of the online monitoring system:



Enhanced water supply in marginalized communities

With a total population of more than 260,000 inhabitants, the Southern Hebron Governorate, has a major need for increased water supply capacity (mainly As Samoua', Ad Dahiriya and Yatta). At the current moment, all water service providers of the governorate suffer from severe shortage of water supply, as their supply is limited to the quantities of water supplied from the Halhul Reservoir twice a week in addition to the quantities supplied by small Israeli connections. According to PWA calculations, the demand at bulk level is estimated at 39,000 m3/day in 2022, while the total supply at bulk level does not exceed 14,000 m3/day (~53 l/c/d) on average with less supply during summer months.

In agreement with the Joint Water Committee, PWA has planned to develop three groundwater wells in the South of Hebron Governorate, in addition to establish a new Mekorot connection point to the south of As Samou'.[6] Out of the three planned wells, PWA has managed to get approval to initiate the drilling of the first groundwater well with an expected capacity of 150-250 m3/hr (3000-4000 m3/day) and establish main Mekorot connection point with potential

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capacity of 1950 m3/hr (38000 m3/day). However, according to the Israeli side, Mekorot connection will not be ready to supply water before 2028 and the development of a groundwater well (drilling, testing and equipping) is therefore assessed as the best suited immediate action which can take place to address the urgent need for improved quantities of water supply consequently increasing the consumption rates in the area.

The scope and intervention strategy of this project are built upon the following results logic:
If an online monitoring system building upon identified innovative solutions, integrating affordability and sustainability considerations, is developed, piloted and operationalized in selected locations across the West Bank; and ***if*** the technical capacities of relevant national partners (mainly WBWD and PWA) for effective and efficient management of the online monitoring system are enhanced, including ability to promptly and adequately respond to water leakages flagged by the online monitoring system; and ***if*** a groundwater well is being constructed in a geographical area of the West Bank suffering from severe water shortage ***then*** the non-revenue of water at bulk level will be reduced and equirable water distribution among water service providers will be enhanced which will ***contribute to*** improved equal access to safe, affordable and reliable water for domestic and commercial use for Palestinians in the West Bank.

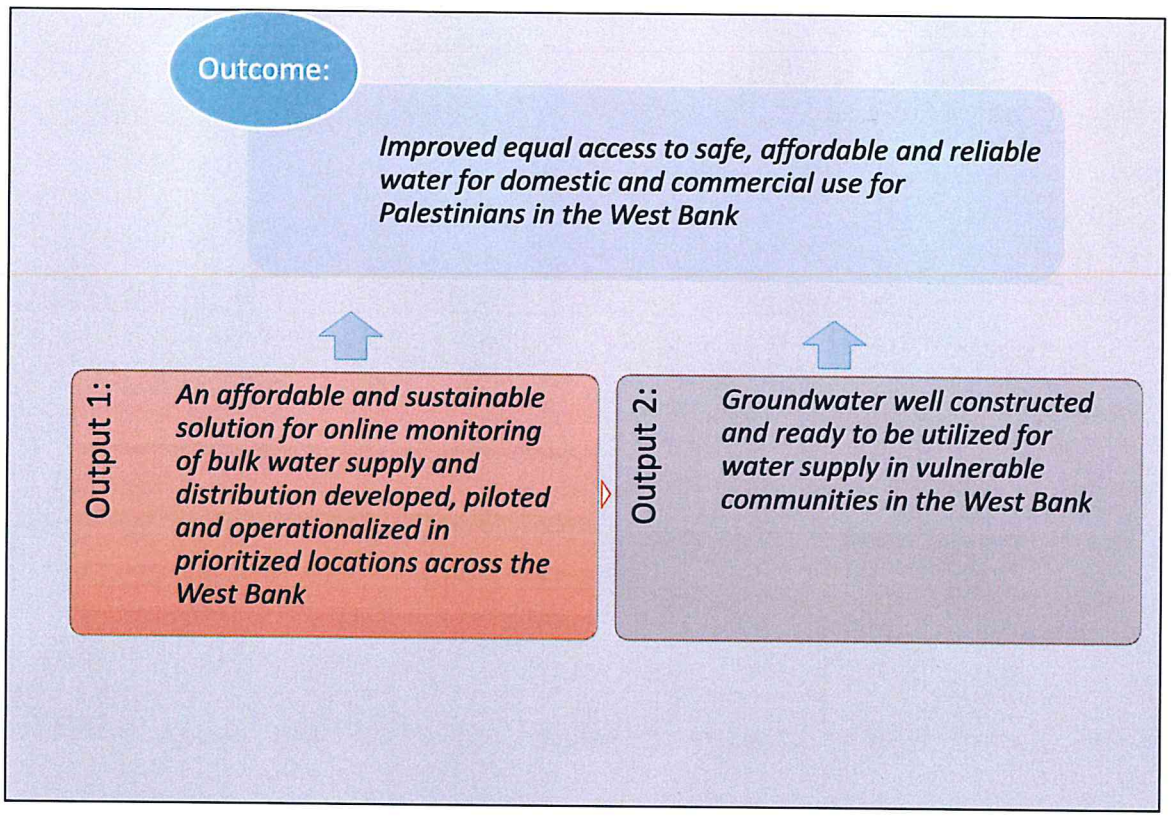
As a secondary objective intends to improve the women representation and empowerment within the water provision utilities. This project will therefore identify ensure gender mainstreaming opportunities during the inception phase in close collaboration with PWA and WBWD with the aim of including specific initiatives in the implementation and exit phase. The gender focal point from PWA will be among the PWA team who will be consulted during the project lifetime on gender mainstreaming aspects.

III. RESULTS AND PARTNERSHIPS

Expected Results

This project intends to achieve the following two outputs, with a view to contribute to the longer-term and higher-level results of *improved and equitable access to quality water services to people ensured:*

1. *An affordable and sustainable solution for online monitoring of bulk water supply and distribution is developed, piloted and operationalized in prioritized locations across the West Bank*
2. *Improved*



Output 1: *An affordable and sustainable solution for online monitoring of bulk water supply and distribution is developed, piloted and operationalized in prioritized locations across the West Bank*
Activity 1.1 Comparative assessment amongst existing solutions for online water monitoring to identify the optimal one (affordable, efficient and sustainable), including an assessment of relevant software and hardware currently available in the WBWD
Activity 1.2 Tailoring and adaptation of the prioritized solution to effectively meet key needs for online water monitoring faced by the WBWD
Activity 1.3 Consultations with the WBWD and other relevant stakeholders for participatory validation and consensus-building on the developed solution for online water monitoring
Activity 1.4 Site preparation, purchasing and installation of measurement and data transition blocks at the site of the water meter
Activity 1.5 Setting up the database management system
Activity 1.6 Developing the mobile application and integration with billing and GIS systems
Activity 1.7 Development of a web portal that integrates the existing SCADA database into the new database system
Activity 1.8 Performance assessment among WBWD staff and facilitation of trainings for management and maintenance of the online monitoring system

This output will be focused on the identification, validation and further adaptation and application of the tested and prioritized innovative solution, that would be adopted in the establishment of the online monitoring system for water supply and distribution in targeted locations across the West Bank. This includes a comparative assessment – undertaken by UNDP/PAPP with an external technical expert/consultant - to identify evaluate and validate the relevance and feasibility of the potential innovative and digital solution to be adopted in the establishment of the online monitoring system, as well as to assess its comparative advantage, affordability and sustainability vis-à-vis other relevant solutions available on the market. The assessment has been completed in May 2022 and the recommended

digital solution has been identified. The project's initiation phase will also enable UNDP/PAPP to continue and expand ongoing consultations with WBWD and relevant stakeholders, including other development actors supporting the national water sector reform, to ensure participatory validation and consensus-building vis-à-vis the online water monitoring solution prioritized and developed.

The potential affordable solution – assessed by UNDP/PAPP with a technical expert - includes installation of Smart Data Transmitters (SDT) that will collect real-time data and transmit it to a database over cloud. SDT can be installed on different water meters such as electromagnetic meters, mechanical meters and ultrasonic meters. Pressure sensors can also be added too, which would enable the prompt detection of potential leakages. Other smart solutions that comply the same criteria (affordable, efficient and sustainable) are also welcomed to be tested. Collected data would then be organized and analysed through a dedicated software, specifically designed for water supply monitoring and management. The software will be developed to match the PWA needs including integration with other applications such as billing and water supply distribution systems. The software provides interpretations and insights on water supply, including water budget and water balance, water leaks detection and water quality monitoring. The results of the analysis are automatically generated and displayed as regular reports on a daily, monthly and annual basis. The online monitoring system can also support the WSDIS and billing system, which will reduce the cost and time needed to generate invoices. As a first stage, around 100 meters will be selected and included in the piloting of the planned online monitoring system. The selected meters will include billing/invoice meters for water service providers, meters for local water sources (i.e., wells) and monitoring meters through main distribution pipelines. The PWA may consider including monitoring meters for the Mekorot connections at later stages, since the sites need extensive preparation such as installing manholes and coordination with relevant Israeli authorities. At least two sites will be identified for further coordination during the inception phase of the project.

WBWD, with support from UNDP/PAPP, conducted an assessment for around 50 meters to be targeted during the first phase. PWA also conducted an assessment for 50 meters in Hebron area. The assessment and analysis include:

1. Readiness of the site availability of electromagnetic or mechanical meter suitable for installing the data transmitter
2. Possibility for optimization of the water supply management
3. Availability of an electrical source, or easy to install solar panel, or long-life batteries
4. Accessibility and safety. No need to seek the Israeli side's approval

Furthermore, the assessment includes financial evaluation covering the following points:

1. Purchase meters (or spare parts) to replace or upgrade the existing meters or establish new monitoring meters
2. Construct monitoring meters (close to Mekorot meters as much as possible) (manholes with all other infrastructures)
3. Purchase Long-Life Batteries
4. Purchase and install Photocells (Solar Panels)
5. Install data transmitters including Mobile cards
6. Purchase 3 Yrs housing Cloud account

Afterwards, the developed solution for online water monitoring will be implemented in 100 locations across five governorates, wherever applicable, in the West Bank - namely Jenin, Tubas, Nablus, and Hebron. These locations have been prioritized based on their readiness for adoption/installation of online water monitoring solutions. Readiness of the above-mentioned locations has been assessed through two surveys, undertaken by UNDP/PAPP on one hand and by PWA on the other hand. This will include site preparation and ensuring that a convenient source of electricity is available, and cellular data signals are strong enough, and then measurement and data transition blocks are installed. The communication channel transmitters then will be identified. The Communication Channel transmits the data via General Packet Radio Service (GPRS) or as SMS on the 2G and 3G cellular communication network's Global System for

Mobile communications (GSM). A database will be built at PWA and then hand it over to the WBWD as part of the implementation of capacity development plan for WBWD. Cloud computing could also be utilized for storing and retrieving the data. The information about the readings of water meters is then received and stored in the relevant database. Data could be received via cloud computing, IP web address, SMS, or General Packet Radio Service (GPRS) via GSM or UHF networks. A mobile application will then be developed and will be integrated with the billing and GIS systems and the existing SCADA database, if possible.

Output 2: *Groundwater well constructed and ready to be utilized for water supply in vulnerable communities in the West Bank*
Activity 2.1 Assessment of the hydrological analysis for the proposed site and detailed well design
Activity 2.2 Review and finalize design for the drilling of deep well, including specifications bill of quantity and EIA
Activity 2.3 Procurement of drilling company to undertake drilling of deep well, including water quality samples and pumping tests and preparing the TOR for well equibement and the transmission pipline from the well to As Samoua'reservoiur

This output aims to ensure increased water supply for vulnerable communities in the West Bank by the construction of a groundwater well in As Samou', Hebron. The well will be developed in two phases; the first phase, which will be developed under this project, is to drill the well with casing, conducting a pumping test and prepare the TOR for equipping the well and install the booster station and pipeline from the well to the existing As Samou' reservoir.

Project Implementation Approach

The project implementation phase is expected to extend over 24 months, with the first 6 months constituting the project's *initiation* phase, followed by 12 months of implementation, and 6 months for commissioning operation and handover.

The project initiation phase will be focused on the validation, adaptation and tailoring of the tested and prioritized innovative solution to be adopted in the establishment of the online monitoring system for water supply and distribution in targeted locations across the West Bank. The project's initiation phase will also enable UNDP/PAPP to continue and expand ongoing consultations with all partners and relevant stakeholders, including other development actors supporting the national water sector reform. During the inhiation phase, a capacity assessment of WBWD's water monitoring and billing system will also be undertaken, which will be crucial for identifying key gaps/needs within the WBWD, in terms of technical capacities and institutional set-up, as well as with regards to relevant hardware and software for monitoring water supply and distribution, and billing. It will also include a gender component, to assess WBWD performance, gaps and areas for improvement in terms of gender mainstreaming. Last but not least, the project's initiation phase will allow for the finalization of a revised Project Document (including detailed workplan, gender mainstreaming action plan, MEAL plan and communication strategy), informed by and adapted to the results of the capacity assessment of WBWD.

Partnerships and Stakeholder Engagement

UNDP has been actively engaging and coordinating with relevant national partners (namely PWA) throughout the project design and planning phase and will continue to do so throughout the whole project cycle. Close consultation and collaboration with relevant local service providers and local authorities, as well as with the Water Sector Regulatory Council, will also be ensured. Upon identification of the best local solution to be adopted in the establishment of the online monitoring system, UNDP will also closely engage and partner with the start-up/entity which developed the prioritized local solution.

Moreover, UNDP intends to undertake regular consultations and knowledge-sharing with all relevant stakeholders, with a particular focus on engaging academia to foster up-take of good practices and lessons learnt throughout the implementation of the project, and potential further research on smart water monitoring and management. Last but not least, UNDP will strive to ensure consultations and engagement with relevant development partners, especially

EU, Austria and WB who are contributing to the water sector reform, with an end view to identify complementarities and promote synergies towards integrated and sustainable development results.

Risks and Assumptions

Several external and internal risks related to the implementation of this project have been identified and registered in the Project Risk Log, in the Annex section. The UNDP project team, as well as other relevant UNDP staff where applicable (e.g. Operations Manager), will carry out regular monitoring of project risks and promptly adopt relevant risk mitigation measures as needed.

Digital Solutions

Digital solutions – adapted to the local context and tailored to respond to key national and local needs - can act as accelerators towards sustainable development. Digitalization represents a key element in this project, which intends to leverage an innovative, digital available solution – that is affordable, reliable and sustainable - to be adopted and applied in the establishment of the proposed online monitoring system for water supply and distribution in the West Bank.

Sustainability and Scaling Up

Under this project, UNDP/PAPP will work in partnership with the relevant national authorities (PWA and WBWD) to promote and strengthen ownership and sustainability of project's intended results. Under the overall guiding framework of the national water sector reform plan, UNDP/PAPP will contribute to enhancing the capacities of PWA and WBWD to ensure effective and efficient management of the online monitoring system for water supply and distribution. This will include not only supporting the development of relevant institutional arrangements, but also technical training for all relevant PWA and WBWD to strengthen their technical know-how and their management and operational capacities vis-à-vis the online monitoring system (including its linkages to the billing system).

Supporting and enhancing capacities within the WBWD can significantly contribute to the potential scaling-up and replication of the prioritized local solution to additional WBWD meters in other locations across the West Bank, thus expanding the coverage and comprehensiveness of the online water monitoring system. Ultimately, the successful implementation of the pilot phase shall demonstrate that NRW can be reduced and – as a result – revenues can go up; thus, the system can be replicated to cover the entire bulk network

IV. PROJECT MANAGEMENT

Cost Efficiency and Effectiveness

With a long-standing presence in the occupied Palestinian territories since 1978, UNDP/PAPP has acquired a deep understanding of the local context. Being a trusted partner and convener, UNDP/PAPP enjoys solid partnerships with Palestinian institutions, civil society organizations, and private sector, as well as with the United Nations Country Team (UNCT) and international development partners. Moreover, UNDP/PAPP has extensive experience on the ground with regards to supporting and facilitating improved access to water (including through infrastructure development and capacity-building of relevant national and local authorities).

In addition, UNDP/PAPP's multi-disciplinary team will ensure compliance of the different project interventions with relevant quality standards, thus enhancing integration and reducing overall transaction costs. This includes drawing on the experience and lessons learnt from previous UNDP/PAPP projects in improving access to water services, having an updated annual implementation plan to procure inputs in a timely manner, continuously monitoring activities costs in the country, and carrying regular review to maximize delivery of the project results within the given resources and to ensure the activities implemented are most likely delivering the intended results.

Project Management

The project will be directly executed by UNDP following the Direct Implementation Modality (DIM). Under this modality, UNDP takes full responsibility for implementation, management, and achievement of project objectives and expected results.

A project implementation unit (PIU) will be established, under the overall guidance and oversight of UNDP/PAPP Programme Analyst. The PIU will consist of a female project manager who will be responsible for the day-to-day management, and 2 site engineers (one female and one male) to supervise implementation of monitoring system (incl. site readiness activities). In addition, UNDP/PAPP's Business Services Support Center (BSSC), finance and procurement teams will provide multi-dimensional support to the project team as needed (including finance, procurement and human resources support

The UNDP Project Implementation Unit (PIU) will be working in close cooperation with the concerned national and local stakeholders, particularly the PWA and WBWD, to deliver the intended results of the project while ensuring national ownership and sustainability.

The project's interventions will be operationalized in the West Bank, with the piloting of the online monitoring system for water supply and distribution being focused on at least 100 targeted locations (across the West Bank) prioritized through appropriate assessment and consultations with the PWA and WBWD.

The UNDP/PAPP team will carry out day-to-day management and supervision of the project's activities with proper monitoring and evaluation as well as quality assurance. UNDP will also ensure relevant stakeholders engagement throughout the planning, design and implementation processes and will coordinate as needed with other relevant development actors supporting the water sector in the West Bank, in order to achieve integrated and sustainable development results.

V. RESULTS FRAMEWORK[7]

Intended Outcome as stated in the UNSDCF/Country [or Regional] Programme Results and Resource Framework:
[UNDAF 2018 – 2022] Outcome 3.3: Palestine's infrastructure, and natural and cultural resources are more sustainably used and managed / Outcome 4.1: More Palestinians, especially the most vulnerable, benefit from safe, inclusive, equitable and quality services
UNSDCF: Outcome 3: Palestinians, including the most vulnerable, have equal access to sustainable, inclusive, quality social services, social protection, and affordable utilities/
UNSDCF: Output 3.3: Improved sustainable and equitable access to safe drinking water and safely managed sanitation services, including solid waste management

Outcome indicators as stated in the Country Programme [or Regional] Results and Resources Framework, including baseline and targets:
PPF Output 4.2 (2018-2022) - Improved and equitable access to quality water services to people ensured

- Indicator: Quantity (cubic meter) of non-revenue water identified through the online system

PPF Output 3.2 (2023-2026) - Enhanced availability of safe water for human and commercial usage

Applicable Output(s) from the UNDP Strategic Plan 2022 - 2025:
SP Output 4.1: Natural resources protected and managed to enhance sustainable productivity and livelihoods
Indicator 4.1.2: Natural resources that are managed under a sustainable use, conservation, access, and benefit-sharing regime:

- Number of shared water ecosystems (fresh or marine) under new or improved cooperative management

Indicator E.1.2: Number of public and private institutions that leverage digital technologies in ways that improves people's lives at sub-national level

Project title and Atlas Project Number: Establishing an Online Monitoring System for Water Supply and Distribution in the West Bank

EXPECTED OUTPUTS	OUTPUT INDICATORS[8]	DATA SOURCE	BASELINE		TARGETS (by frequency of data collection)			DATA COLLECTION METHODS & RISKS
			Value	Year	2023	2024	FINAL	
Output 1 *An affordable and sustainable solution for online monitoring of bulk water supply and distribution is developed, piloted and operationalized in prioritized locations across the West Bank*	***1.1** Online water monitoring solution developed and operationalized at PWA (Binary: Yes / No)*	UNDP project monitoring	No	2022	No	Yes	Yes	Report of comparative assessment of potential solutions.
	***1.2** Number of locations where the online monitoring solution is installed and functional*	UNDP project monitoring; WBWD records	0	2022	0	100	100 locations across 4 governorates	Maps of targeted locations.

[7] UNDP publishes its project information (indicators, baselines, targets and results) to meet the International Aid Transparency Initiative (IATI) standards. Make sure that indicators are S.M.A.R.T. (Specific, Measurable, Attainable, Relevant and Time-bound), provide accurate baselines and targets underpinned by reliable evidence and data, and avoid acronyms so that external audience clearly understand the results of the project.

[8] It is recommended that projects use output indicators from the Strategic Plan IRRF, as relevant, in addition to project-specific results indicators. Indicators should be disaggregated by sex or for other targeted groups where relevant.

EXPECTED OUTPUTS	OUTPUT INDICATORS[8]	DATA SOURCE	BASELINE		TARGETS (by frequency of data collection)			DATA COLLECTION METHODS & RISKS
			Value	Year	2023	2024	FINAL	
							in the West Bank	
	***1.3** Number of staff in WBWD received training to manage and maintain the online monitoring system (disaggregated by gender and age)*	UNDP project monitoring; WBWD records	0	2022	TBD	TBD	TBD	Records of participants in training.
	***1.4** Percentage of female consultance hired to develop the online monitoring system*	UNDP project monitoring; WBWD records	0	2022	30% of the team are females	30% of the team are females	30% of the team are females	Action plan arrived from the capacity assessment report
Output 2 *Groundwater well constructed and ready to be utilized for water supply in vulnerable communities in the West Bank*	***2.1** Drilling of well completed (Binary: Yes / No)*	UNDP project monitoring; drilling company report	No	2022	No	Yes	Yes	Drilling Company's progress report; field visits
	***2.2.** Percentage of mandatory water quality tests successfully* conducted* ***Successfully** is here defined as aligned with the minimum standards for quality drinking water*	UNDP project monitoring	0	2022	TBD	TBD	TBD	Lap records

VI. MULTI-YEAR WORK PLAN [9][10]

All anticipated programmatic and operational costs to support the project, including development effectiveness and implementation support arrangements, need to be identified, estimated and fully costed in the project budget under the relevant output(s). This includes activities that directly support the project, such as communication, human resources, procurement, finance, audit, policy advisory, quality assurance, reporting, management, etc. All services which are directly related to the project need to be disclosed transparently in the project document.

Budget for the Action						2022	2023	2024	TOTAL
Item	Description	Unit	# of units	Unit Rate (US$)	Cost (US$)	Cost (US$)	Cost (US$)	Cost (US$)	Cost (US$)
Project implementation Unit and operations									
Project Manager NPSA 8- 0% first 3 months, 100% next 24 months	salary	Per Month	24.0	5,164.3	123,943.7	0.0	61,971.8	61,971.8	123,943.7
Site Engineer 1 (100%)-NPSA 7- 12 months	salary	Per Month	12.0	4,609.4	55,312.4	0.0	55,312.4	0.0	55,312.4
Site Engineer 1 (100%)-NPSA 7- 12 months	salary	Per Month	12.0	4,609.4	55,312.3	0.0	55,312.3	0.0	55,312.3
Site Engineer 1 (100%)-NPSA 7- 12 months	salary	Per Month	12.0	4,609.4	55,312.4	0.0	55,312.4	0.0	55,312.4
DPC- Programme Associate-GS6- 24 months-10 %	Salary	Per Month	24.0	615.0	14,760.0	0.0	7,380.0	7,380.0	14,760.0
DPC- / (HR +Fin+ Procu+..etc) ISS-Implementation Support Services	Centralized Finance, HR, and Procurement Services	lump Sum/Year	2.0	3,713.0	7,426.0	0.0	3,713.0	3,713.0	7,426.0
GOE 4 team members (GOE+email+UNDSS security+ LMS+ Office Rent and utilities expenses including general operating expenses at site offices)	GOE (GOE+email+ UNDSS 3 new Site Eng+exist PM) security+ LMS+ Office Rent and utilities expenses including general operating expenses at site offices)	Lump Sum			15,112.5	0.0	7,556.3	7,556.3	15,112.5
DPC- Communication		Lump Sum	2.0	1,500.0	3,000.0	0.0	1,000.0	2,000.0	3,000.0
PIU- Services to project implementation & Vehicle Fuel, Maintenance and insurance. Etc)	Transportation	Per Month	24.0	681.8	15,000.0	2,727.3	8,181.8	4,090.9	15,000.0
Subtotal Project Implementation Unit & Operation					**345,179.3**	**2,727.3**	**255,740.0**	**86,712.0**	**345,179.3**
Output # 1: An affordable and sustainable solution for online monitoring of bulk water supply and distribution developed and piloted in prioritized locations across the West Bank									
*Assessment of local solutions	Contractual services companies	Lump sum	1.0	0.0	0.0	0.0	0.0	0.0	
Tailoring and adaptation of the solution	Contractual services companies	Lumpsum	1.0	30,000.0	30,000.0	10,000.0	20,000.0	0.0	30,000.0
Setting up the dedicated monitoring and data analysis software and customize it as per the specifications and requirements	Contractual services companies	Lumpsum	1.0	25,000.0	25,000.0	0.0	25,000.0	0.0	25,000.0
Technical back stopping (advisor)	IC contract	LOE	50.0	400.0	20,000.0	5,000.0	10,000.0	5,000.0	20,000.0
Site preparation	Contractual services Companies	Unit	100.0	1,000.0	100,000.0	0.0	100,000.0	0.0	100,000.0

[9] Cost definitions and classifications for programme and development effectiveness costs to be charged to the project are defined in the Executive Board decision DP/2010/32

[10] Changes to a project budget affecting the scope (outputs), completion date, or total estimated project costs require a formal budget revision that must be signed by the project board. In other cases, the UNDP programme manager alone may sign the revision provided the other signatories have no objection. This procedure may be applied for example when the purpose of the revision is only to re-phase activities among years.

Installation of data transmitter blocks	Contractual services Companies	Unit	100.0	2,800.0	280,000.0	0.0	180,000.0	100,000.0	280,000.0
Setting up the data base management for monitoring and billing system	Contractual services Companies	Lumpsum	1.0	25,000.0	25,000.0	0.0	25,000.0	0.0	25,000.0
Need assessment and capacity building plan for WBWD	Professional Individual/Institutional Contract	Per Unit	1.0	20,000.0	20,000.0	5,000.0	15,000.0	0.0	20,000.0
Implementation of the capacity building plan (could be workshops, structured training and exchange visits)	Workshops/Contractual services Companies	Per Unit	1.0	50,000.0	50,000.0	0.0	30,000.0	20,000.0	50,000.0
Sub-total output # 1					**550,000.0**	**20,000.0**	**405,000.0**	**125,000.0**	**550,000.0**
Output # 2 Groundwater well constructed and ready to be utilized for water supply in vulnerable communities in the West Bank									
Assessment of the hydrological analysis and design including EIA	Contractual services Companies	Lump some	1.0	100,000.0	100,000.0	20,000.0	80,000.0	0.0	100,000.0
Drilling of deep well	Contractual services Companies	Lumpsum	1.0	620,000.0	620,000.0	0.0	620,000.0	0.0	620,000.0
Pumping tests, geophysical test and water analysis	Contractual services Companies	Lumpsum	1.0	300,000.0	300,000.0	0.0	300,000.0	0.0	300,000.0
Sub-total output # 2					**1,020,000.0**	**20,000.0**	**1,000,000.0**	**0.0**	**1,020,000.0**
Visibility	Communication and Visibility/Professional Individual/Institutional Contract	Per Activity	1.0	12,000.0	12,000.0	0.0	6,000.0	6,000.0	12,000.0
Quality Assurance	Quality Assurance including M&E	Per Month	24.0	1,000.0	24,000.0	0.0	12,000.0	12,000.0	24,000.0
Sub-total activities					**1,951,179.3**	**42,727.3**	**1,678,740.0**	**229,712.0**	**1,951,179.3**
General Management Services (GMS) 8%	GMS				156,094.3	3,418.2	134,299.2	18,377.0	156,094.3
Levy Coordination fees 1.0%					21,072.7	21,072.7	0.0	0.0	21,072.7
Total project budget				**Total Fund**	**2,128,346.3**	**67,218.2**	**1,813,039.2**	**248,089.0**	**2,128,346.3**
									2,143,346.3

* US$ 15,000 UNDP contribution from TRAC resources

Installment 1 850,000.0
Installment 2 1,293,346.3

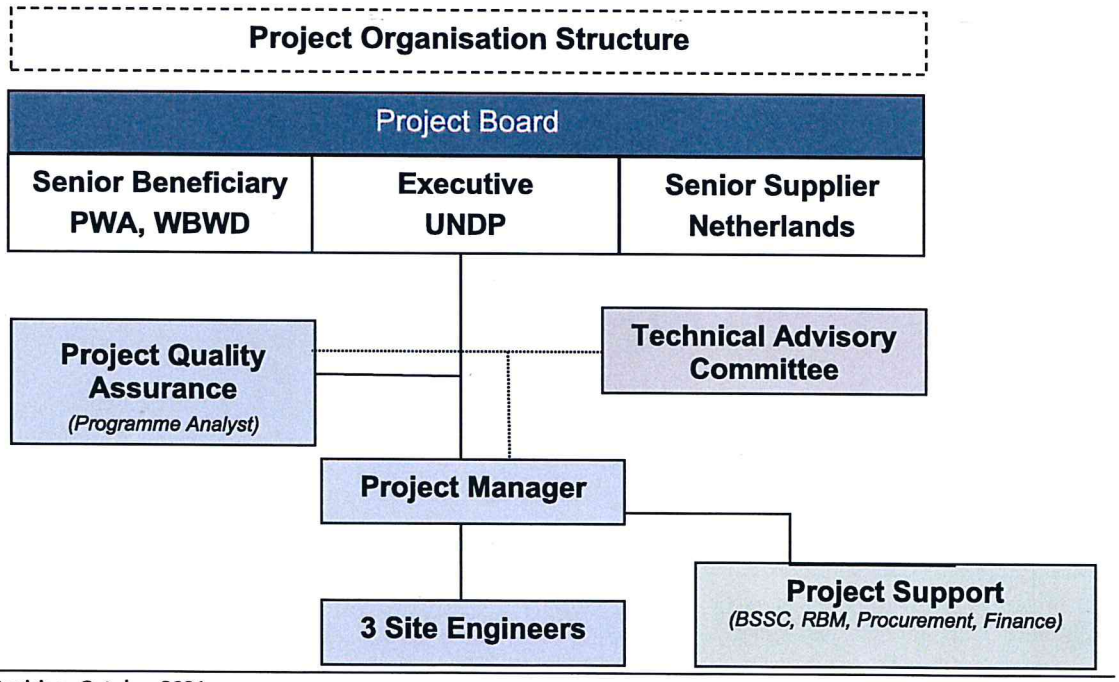
VII. GOVERNANCE AND MANAGEMENT ARRANGEMENTS

UNDP/PAPP works in partnership with relevant governmental agencies and delivers through the Direct Implementation (DIM) modality, which will be the mechanism for the implementation of this project. Under such modality, the final accountability of the project results and financial management rests with UNDP/PAPP. An MOU will be signed with PWA before starting the project implementation, stating clearly the need for securing budget for maintaining and operating the monitoring system and requesting assigning a team from among PWA and WBWD to be involved in the project implementation.

The project will be overseen by a Project Board, comprising the donor/Government of the Netherlands (as senior supplier), the PWA (as senior beneficiary), and UNDP/PAPP (as executive/implementing agency). The Project Board will first convene at the end of the initiation phase, to review and approve the finalized Project Document – including results of local solutions assessment and WBWD capacity assessment. The Project Board will then meet annually – or more often if deemed necessary by the Project Manager and/or Programme Analyst – and will be the main platform for strategic decision-making relevant to the project. In addition, a Technical Advisory Committee (comprising representatives from PWA, WBWD, WSRC, Ministry of Local Government, academia, and relevant start-ups and private sector) will be meeting every six months – or more often if deemed relevant.

The direct oversight of the project within UNDP/PAPP will be ensured by the Programme Analyst responsible for the energy and natural resources portfolio, who will hold a programmatic quality assurance role during the implementation phase and will be ultimately responsible for ensuring all deliverables and intended results are timely achieved. The UNDP/PAPP project team will be supported by the Assistant Special Representative who will provide overall strategic guidance and direction, and by the Deputy Special Representative who will provide high-level oversight.

The project team, under the overall guidance and oversight of UNDP/PAPP Programme Analyst, will consist of a project manager who will be responsible for the day-to-day management, and 2 site engineers to supervise implementation of monitoring system (incl. site readiness activities). In addition, UNDP/PAPP's Business Services Support Center (BSSC), finance and procurement teams will provide multi-dimensional support to the project team as needed (including finance, procurement and human resources support). Moreover, a designated focal point from UNDP/PAPP's RBM team will work together with the project team to support timely and quality M&E functions. This includes technical support in reviewing and reporting progress against project milestones/targets in line with UNDP's corporate and donor reporting requirements, as well as capturing and disseminating relevant lessons learnt throughout the project cycle with partners and relevant stakeholders.

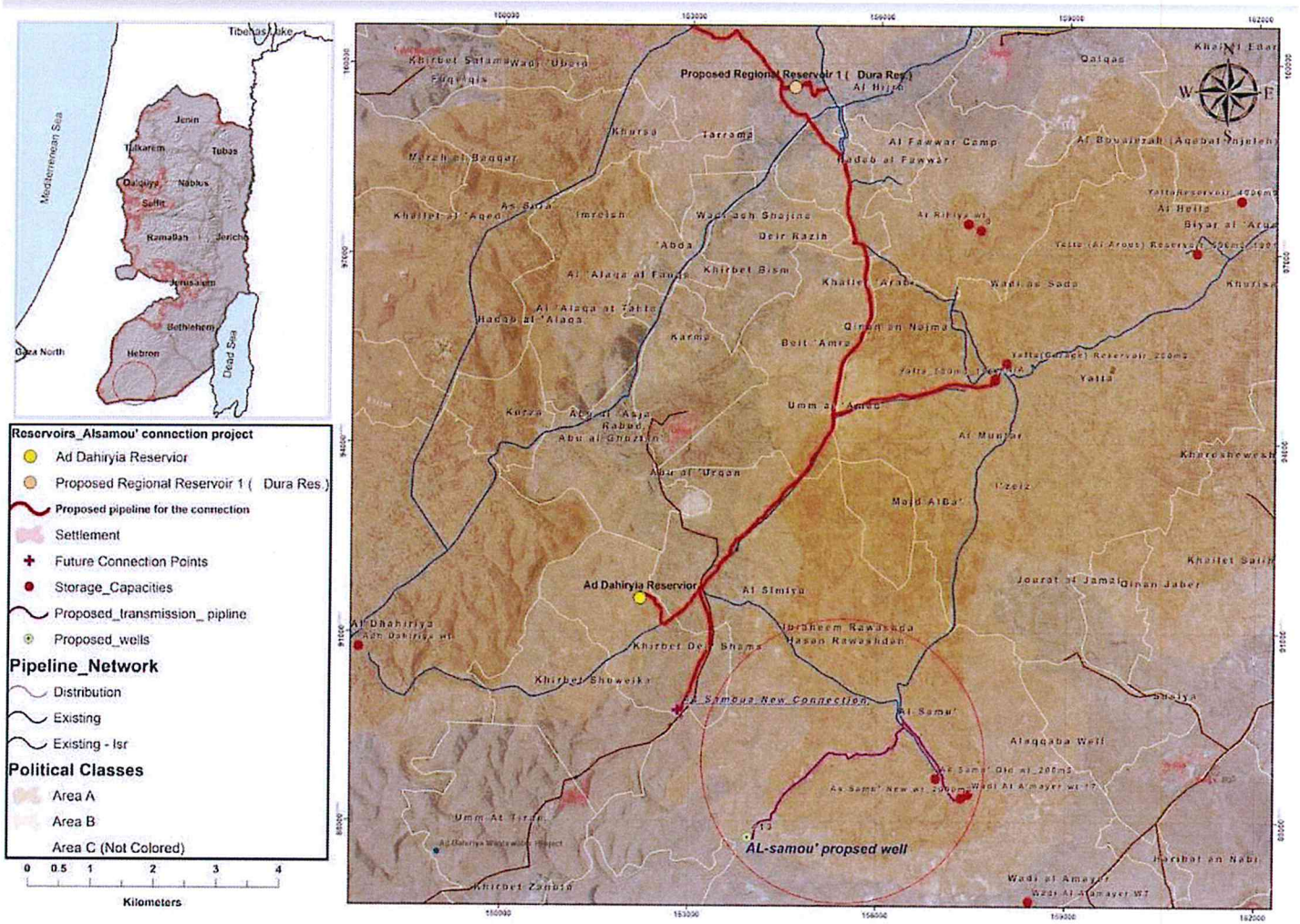


ANNEX I. Risk Register

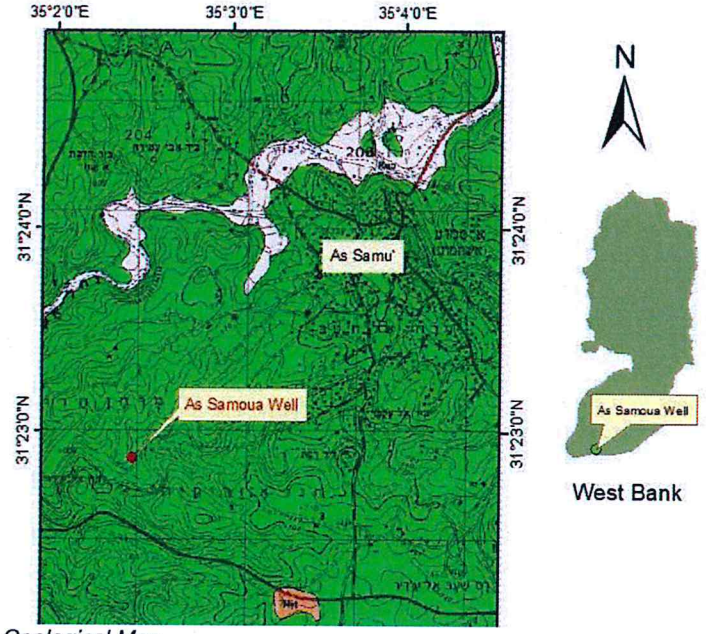
	Description	Risk category	Likelihood & Impact	Risk management measures	Risk owner
1	Continued outbreak of COVID 19 may prevent timely implementation of the project.	Operational	L = 3 I = 2 Risk level: Moderate	UNDP will monitor government announced restrictions to determine necessary adjustment in the implementation measures.	UNDP's Head of Operations
2	Deterioration of the security situation in the West Bank and increased movement restrictions	Operational Safety and Security	L = 3 I = 2 Risk level: Moderate	UNDP, in coordination with UNDSS, will continuously monitor the security situation across the West Bank, and assess the potential impact on the project implementation in the targeted project locations. UNDP has dealt with similar scenarios in the past and has the necessary experience to adapt to changes in programme implementation.	UNDP's Head of Security
3	Resistant of some stakeholders among PWA to the new system	Operational	L:2 I:1 Risk lever: Moderate	UNDP has involved all relevant stakeholders in the discussion at an early stage and will continue the consultation during the full life of the project.	Programme Analyst
4	The capacity of PWA and WBWD for monitoring and maintaining the digital solutions is not sufficient.	Operational	L:2 I:2 Risk level: Moderate	A need assessment and capacity building plan will be prepared and implemented during the implementation of the project.	Programme Analyst
5	The identified digital solutions are not sustainable.	Strategic	L:2 I:2 Risk level: Moderate	UNDP will carry an assessment before selecting the digital solution to ensure that all parameters contributing to sustainability of the solution are considered. Operation and maintenance plans for the on-line monitoring system will be prepared and cost will be estimated and communicated to PWA to ensure that enough budget is allocated from PA recourses. An MOU will be signed with PWA before starting the project implementation clearly stating the need for securing budget for maintaining and operating the monitoring system and requesting assigning a team from among PWA and WBWD to be involved in the project implementation.	Programme Analyst

6	The results of pumping test and water quality analysis are not in line with the project target	Operational	L:2 I:2 Risk level: Moderate	PWA reports and studies for the proposed area will be consulted before the hydrological analysis Hydrogeological analysis will be conducted for the proposed site of the well before drilling Sampling from the surrounding wells to ensure water availability in the aquifer	Programme Analyst
7	Delay in supply of casing material	Operational	L:2 I:2 Risk level Moderate	Cooperation with PWA to get approval from COGAT on time	Programme Analyst

ANNEX II. Connection of new deep well



ANNEX III. Location of deep well



Geological Map



Location Map

ANNEX IV. Well specifications

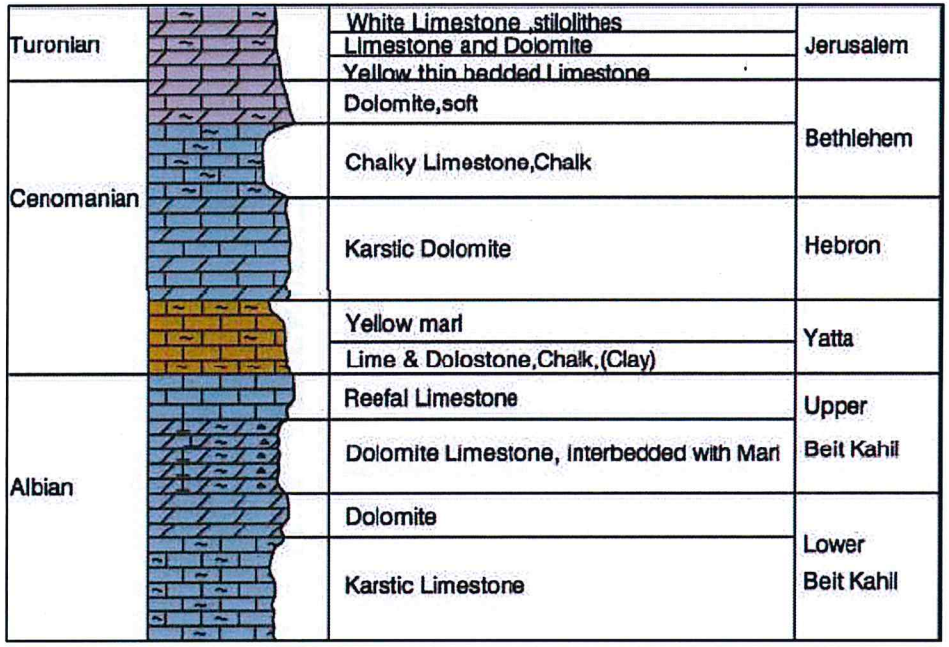
A. Location: As Samou', Hebron
B. Coordinates: X=143105, Y=84258
C. Aquifer/Basin: Western Aquifer Basin, Lower aquifer
D. Ground elevation:610 m above MSL.
E. Expected Depth: 610 m
F. Expected pumping: 200 m^3/hr (max=1.25 MCM/yr)
G. Type of Use: Domestic
H. Direct Beneficiaries: Al-Samou', Al-Dhahiriya, Yatta, Reef Yatta and Reef Dura
I. Indirect Beneficiaries: The remaining communities within Hebron Governorate

ANNEX V. Hydrogeologic Setting

Depth	Typical Lithology	Age	Palestinian Terminology
0-140	Karstified limestone, and dolomite	Turonian	Jerusalem
140-190	Limestone, dolomite, and marly limestone (karstic)	Upper Cenomanian	Upper Bethlehem
190-240	Limestone, marly limestone, chalky limestone, and dolomitic limestone		Lower Bethlehem

240-290	Karstic limestone, and dolomite		Hebron
290-300	Marl, clay and marly limestone		Upper Yatta
300-380	Limestone, chalky limestone and dolomitic limestone		Lower Yatta
380-460	Reefal limestone interbedded with marl and dolomite interbedded with marl	Albian	Upper Beit Kahil
460-610	Limestone, dolomitic and marly limestone		Lower Beit Kahil

ANNEX VI. Stratigraphic Section


Turonian
White Limestone ,stilolithes
Limestone and Dolomite
Yellow thin bedded Limestone
Jerusalem
Cenomanian
Dolomite,soft
Chalky Limestone,Chalk
Bethlehem
Karstic Dolomite
Hebron
Yellow marl
Lime & Dolostone,Chalk,(Clay)
Yatta
Albian
Reefal Limestone
Dolomite Limestone, interbedded with Marl
Upper Beit Kahil
Dolomite
Karstic Limestone
Lower Beit Kahil

ANNEX VII. Well Design

