

Support to Ukrainian Water and Sanitation Utilities by the Dutch Drinking Water Sector

Independent External Evaluation - Final Report

Submitted to: VEI

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Date: 27/02/2025

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Abbreviations

BBB	Build Back Better
DAC	Development Assistance Committee
EIB	European Investment Bank
EKN	Embassy of the Kingdom of the Netherlands
EPANET	Water Distribution Modeling Software
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
ICRC	International Committee of the Red Cross
IEE	Independent External Evaluation
IOM	International Organization for Migration
KII	Key Informant Interview
MoFA	Ministry of Foreign Affairs
NRW	Non-Revenue Water
OECD	Organisation for Economic Co-operation and Development
SCADA	Supervisory Control and Data Acquisition
Swedfund	Sweden's Development Finance Institution
ToR	Terms of Reference
VEI	Vitens Evides International
VK	Vodokanal (Ukrainian Water Utility)
WASH	Water, Sanitation, and Hygiene
WatSan	Water and Sanitation
WOP	Water Operator Partnership
WP	Work Package
WWX	WaterWorX
WWX-U	WaterWorX Ukraine

Executive Summary

The "Support to Ukrainian Water and Sanitation Utilities by the Dutch Drinking Water Sector" project (WWX-U) was implemented to address the critical challenges faced by Ukraine's water and sanitation (WatSan) utilities amid the ongoing war. The project, approved on October 10, 2023, with a budget of €6 million, aimed to restore essential services, build resilience, and develop long-term investment plans for five key Ukrainian Vodokanals (VKs): Kherson, Pokrov, Nikopol, Marganets, and Kramatorsk.

This Independent External Evaluation (IEE) assesses the project's performance against the OECD-DAC Criteria—Relevance, Coherence, Effectiveness, Efficiency, Impact, and Sustainability—covering the implementation period from October 2023 to March 2025. The evaluation was conducted remotely due to security constraints and relied on document reviews, key informant interviews (KIIs), and an online training feedback survey.

Key Findings and Conclusions

Relevance

The project effectively aligned with the urgent needs of Ukrainian VKs, prioritising infrastructure restoration and capacity-building. It focused on ensuring access to clean and safe water, improving operational efficiencies, and equipping VKs with the necessary tools and resources to sustain water services during the conflict. The project demonstrated responsiveness to the evolving situation, particularly in addressing unexpected logistical and operational challenges, such as securing necessary vehicle procurements for the affected utilities. Additionally, although not a primary focus, the project contributed to energy efficiency by modernising outdated systems, which indirectly reduced power consumption and improved sustainability.

Coherence

The project's three core components—priority investments, capacity-building training, and long-term investment planning—were well-structured and complemented each other to achieve the overarching objectives. Internal collaboration within the WWX consortium facilitated seamless coordination among the Dutch water utilities, optimising the use of expertise and resources. However, early-stage coordination with external partners such as the WASH Cluster and GIZ could have been more proactive to streamline efforts and minimise potential overlaps. Strengthened engagement with humanitarian organisations and local stakeholders would further enhance integration with broader recovery initiatives.

Effectiveness

By Q4 2024, the project had achieved significant progress, completing 70% of planned infrastructure investments, directly benefiting over 192,200 individuals with improved access to clean water and sanitation services. Training sessions were well-received, with 120 out of the planned 144 sessions completed, covering key topics such as hydraulic modelling, NRW (Non-Revenue Water) reduction, and financial management for VKs. The development of long-term investment plans for the five VKs was also a major milestone, aligning with funding institutions such as the European Investment Bank (EIB) and Swedfund. However, the effectiveness of these plans is contingent on securing sustained funding and stabilising post-war economic conditions.

Efficiency

Despite wartime constraints, the project exhibited strong cost-efficiency by allowing VKs to identify their most pressing procurement needs, ensuring that investments were directly aligned with operational priorities. The lean project structure and adaptive approach enabled rapid decision-making, avoiding bureaucratic delays. However, the reliance on remote monitoring, while necessary for security reasons, limited the ability to conduct thorough on-

the-ground verification of activities. Future projects could benefit from enhanced digital tracking and real-time monitoring systems to improve oversight and accountability.

Impact

The project significantly strengthened the resilience of VKs by not only restoring critical infrastructure but also modernising their operations through improved governance and technical training. It introduced structured investment planning, which has set a foundation for long-term sustainability and potential EU integration. Unintended positive effects included the development of more transparent procurement processes and increased workforce competitiveness, as VKs adapted to international standards. However, the project also placed additional administrative burdens on VKs, necessitating ongoing capacity-building support to sustain these improvements.

Sustainability

Ensuring the long-term sustainability of project outcomes requires continued technical support, financial planning, and institutional capacity-building. A significant step in this direction will be the establishment of a national training center in Lviv subject to funding of a project extension, which will provide ongoing professional development for VK personnel. However, sustaining investment plans beyond donor funding remains a challenge, requiring structured financing mechanisms such as public-private partnerships and municipal co-funding. Strengthening local supply chains for spare parts and equipment maintenance is also crucial to reducing dependency on external aid.

Recommendations:

1. **Enhancing Remote Management** – Strengthen third-party verification networks to improve accountability, expand digital monitoring tools for real-time data collection, and implement hybrid training approaches that combine online modules with in-person practical sessions.
2. **Transitioning to In-Person WOP Model** – As security conditions permit, restore direct Dutch-Ukrainian collaboration, enabling technical experts to provide hands-on support and guidance to VKs.
3. **Sustaining Services During Conflict** – Focus on ensuring uninterrupted service delivery by prioritising energy resilience, streamlining procurement pathways for essential materials, and developing decentralised training hubs to enhance local capacity.
4. **Post-War Reconstruction** – Convert investment plans into actionable projects with structured financing, align VKs with EU regulatory frameworks for improved governance, and introduce financial self-sufficiency models to reduce reliance on donor funding.
5. **Implementing Long-Term Investment Plans** – Secure sustainable financing through partnerships with national and international institutions, coordinate investments with national infrastructure agencies for integrated planning, and establish a monitoring framework to ensure investments align with post-war recovery needs.

The WWX-Ukraine project successfully adapted to the complex and volatile conflict environment, delivering critical infrastructure support while laying the groundwork for long-term sustainability. Future interventions should build on these foundations, ensuring continued resilience, operational efficiency, and sustained impact in Ukraine's water sector.

1 Introduction

Approved on 10th October 2023, the €6 Million project titled "**Support to Ukrainian Water and Sanitation Utilities by the Dutch Drinking Water Sector**" (hereafter referred to as the Project) emerged as a critical intervention due to the immense challenges Ukraine's **Water and Sanitation (WatSan)** utilities have faced amid the ongoing war. The devastating impact of the war, particularly in the Eastern regions, has severely compromised the country's fragile water infrastructure. Before the conflict, approximately 10 million Ukrainians lacked access to safe water services, and 20 million were without centralised wastewater treatment. The war has only exacerbated these vulnerabilities, with extensive damage to WatSan infrastructure, strained resources due to an influx of Internally Displaced Persons (IDPs), and the inability of many citizens to pay for these essential services. As a result, the Ukrainian government and international bodies have recognised the urgent need for comprehensive support to maintain and restore water services, particularly in frontline regions such as the Kherson Oblast.

This Project was initiated as part of the broader **WaterWorX (WWX)** initiative, a partnership between Dutch public water operators (led by VEI and World Waternet) and the Dutch Ministry of Foreign Affairs. The overarching goal of WWX is to increase sustainable access to drinking water for 10 million people by 2030. However, unlike other **Water Operator Partnerships (WOPs)** within WWX, where a single Dutch utility typically partners with a specific counterpart, **WWX Ukraine (WWX-U)** adopts a consortium-based approach. Expertise and knowledge are collectively provided by all ten Dutch partner utilities, rather than being limited to one-on-one partnerships. This collaborative model enables the consortium to leverage a diverse pool of experts across all participating Dutch utilities to support the five key Ukrainian **Vodokanals (VK) — Kherson, Pokrov, Nikopol, Marganets, and Kramatorsk**. These utilities, particularly those in the frontline regions, have been directly impacted by the war, including infrastructure destruction, revenue losses, and safety risks to staff.

The primary objectives of this project were to deliver immediate support and build long-term resilience for these utilities over a period of 18-months (ended 31st March 2025) through a three-pronged approach:

- **Work Package 1 (WP1) – Deliver Short-Term Investments:** This involves providing critical equipment, materials, and tools to the VKs to ensure the continuation of essential water services. This work package addresses immediate needs identified by the utilities, which have been revised and prioritised through consultation with local operators and the WWX team.
- **Work Package 2 (WP2) – Capacity Building through Training:** The Project seeks to enhance the VKs' technical and operational capacities by offering training in key areas such as billing and collection, water meter management, and Non-Revenue Water (NRW) reduction. Due to the war, training has been delivered through online sessions and in-person workshops in the Netherlands. However, participation is limited by travel restrictions and staffing shortages.
- **Work Package 3 (WP3) – Development of Long-Term Investment Plans:** Using the "Build-Back-Better" approach, the Project aims to create climate-resilient investment plans for each VK. These plans will serve as a foundation for securing further investments and ensuring that water services are restored and improved in the post-war period.

The Project's implementation is governed by a structured approach involving key stakeholders, including VEI B.V. as the lead partner for the WWX consortium of ten Dutch water operators. The consortium oversees the project, while a dedicated implementation team has been established to ensure effective execution. This team comprises a project manager,

a coordinator/translator, two technical experts (based in the Netherlands), and a local coordinator based in Ukraine, bringing together both Dutch and Ukrainian expertise. The team maintains daily contact with the five VKs to monitor progress, address emerging challenges, and ensure that investments and capacity-building efforts remain aligned with the VKs' needs, despite the ongoing safety.

This project represents an essential lifeline for the affected Ukrainian utilities, providing short-term relief and long-term water and sanitation services solutions. It plays a critical role in restoring basic services and laying the groundwork for future recovery and resilience in Ukraine's water sector. Understanding these objectives, approaches, and governance structures is crucial for evaluating the Project and ensuring that the methodology and scope of this proposal align with the Project's needs and the challenges presented by the ongoing conflict.

1.1 Purpose and Scope of this Evaluation

This Independent External Evaluation (IEE) focuses on assessing the Project's performance and outcomes against the OECD-DAC Criteria and the specific objectives outlined in the ToRs. The IEE was conducted remotely, considering Ukraine's security situation, relying on document reviews, interviews with key stakeholders, online feedback surveys, and quantitative and qualitative data analysis. It covers the period from the Project's initiation in October 2023 to project completion (31 March 2025).

2 Approach and Methodology

2.1 Specific Evaluation Objectives

The Evaluation's specific objectives are defined as follows (note that these objectives have been adapted from the ToR, operationalised in the evaluation matrix, and elaborated according to the OECD-DAC criteria):

1. Relevance:

- a. Assess the alignment of the Project's objectives with the needs of the Ukrainian water and sanitation utilities and the broader humanitarian and development goals, particularly considering the ongoing conflict.
- b. Examine the extent to which the Project's design and interventions remained pertinent to the evolving circumstances in Ukraine.
- c. Provide information on the link between water and energy, particularly how supporting the water sector benefits critical energy needs, considering that the Dutch government focuses on urgent energy sector needs.

2. Coherence:

- a. Evaluate the Project's internal coherence, examining how well its components and work packages aligned with each other and contributed to achieving the overall objectives.
- b. Analyse external coherence by assessing the Project's coordination and complementarity with similar initiatives, including donor efforts and government strategies in the water sector.
- c. Evaluate the cooperation between the 10 Dutch drinking water companies and how the emergency structure in Ukraine differs from the regular WWX program, assessing the implications of these differences for overall project success.

3. Effectiveness:

- a. Measure the Project's success in achieving its objectives, including restoring water and sanitation services, building capacity for VKs, and developing long-term investment plans.
- b. Independently and objectively verify Work Package achievements, including outputs and outcomes against the performance indicators listed in the ToR, acknowledging that verification can only be done remotely with stakeholder support.
- c. Assess the effectiveness of the WWX consortium supporting utilities in an emergency response context.
- d. Determine stakeholders' understanding and appreciation of the Project, focusing on their perspectives regarding the results, challenges, lessons learned, and willingness to participate in further partnerships.

4. Efficiency:

- a. Assess the Project's cost-efficiency, evaluating how well resources were utilised to deliver the intended outcomes under the constraints of the ongoing conflict.
- b. Evaluate the efficiency of the remote implementation strategy, examining the effectiveness of communication channels, monitoring systems, and logistical arrangements in delivering the Project outcomes.

5. Impact:

- a. Evaluate the Project's broader impact on the targeted VKs' resilience, particularly in restoring access to water and sanitation services for the affected populations.

- b. Analyse any unintended positive or negative effects of the Project on the local water sector and communities, considering the challenges posed by the conflict.

6. Sustainability:

- a. Assess the sustainability of the Project’s outcomes, including the likelihood that the VKs will maintain and expand the improvements made after the Project ends, particularly regarding infrastructure and capacity-building.
- b. Examine the Project’s contribution to building long-term resilience in the Ukrainian water sector, focusing on infrastructure investments, sustainability of capacity-building efforts and the capacity for emergency response.

7. Recommendations and Lessons Learned:

- a. Provide recommendations on how the remote management approach could be improved for future projects, drawing on lessons learned from this specific context.
- b. Assess the feasibility of a follow-up program, identifying priority areas that should be targeted for future support to ensure the sustainability and scalability of the Project’s achievements.
- c. Provide recommendations on implementing WP3 Long Term Investment Plans, with an emphasis on how these plans can be sustained and scaled in the future

2.2 Evaluation Matrix

Based on the specific objectives outlined in Section 2.1, the Evaluator produced an Evaluation Matrix (see Appendix 1) containing the final list of questions to be answered by the IEE. This report's findings, conclusions, and recommendations follow the same structure. This Matrix was finalised in close coordination with the Project team to ensure it reflected the situation on the ground.

2.3 Techniques and Tools for the Evaluation

The IEE was conducted through a comprehensive **Document Review**, several **Key Informant Interviews (KIIs)**, and an online **Training Feedback Survey**. This survey was not originally part of the IEE design but was mutually agreed upon with the Project Team during the development of the Evaluation Matrix. These methods allowed the evaluator to triangulate findings from multiple sources and ensure the accuracy and validity of the conclusions.

2.3.1 Document Review

A total of 11 documents/materials were reviewed, providing an understanding of the Project, its objectives, governance structure, and performance to date. These documents included the following:

S#	Document Name	Year	Date of Publication	Type	File Name
1	Spending Proposal for WWX-U	2023	20-Apr-2023	Proposal	2023.04.20 Bestedingsvoorstel WWX consortium Oekraïne FINAL (002) nl.docx
2	Final Proposal for WWX Ukraine	2023	15-Sep-2023	Proposal	2023.09.15 final proposal Ukraine WWX_EN.pdf
3	Subsidy Approval for WWX-U	2023	10-Oct-2023	Approval	4000007046_VEI_Ukraine_Subsidy approval october 2023-nl.pdf
4	Inception Report Approval	2024	30-Apr-2024	Approval	4000007046_VEI_Ukraine_Inception report approval-en.pdf
5	Inception Report WWX Ukraine	2024	15-Mar-2024	Report	Inception Report WWX Ukraine 15March24 v5.pdf

S#	Document Name	Year	Date of Publication	Type	File Name
6	Addendum to the WWX-U Inception Report	2024	07-Mar-2024	Supplementary Report	Addendum to the WWX-U Inception Report.pdf
7	Terms of Reference for Investment Plans	2024	12-Jul-2024	ToR	ToR - Investment Plans for 5 Vodocanals.pdf
8	Annual Report 2023 - WWX-U	2024	19-Jul-2024	Report	Annual Report 2023 WWX-U final 190724.pdf
9	RHDHV Proposal for Long-Term Investment Plans	2024	30-Aug-2024	Proposal	BK1864 RHDHV Proposal VEI Ukraine Long Term Investment Plan.pdf
10	Annual Plan 2025 - WWX-U	2024	01-Nov-2024	Plan	Annual Plan 2025 WWX-U.pdf
11	MoFA Presentation - WWX Ukraine	2024	09-Oct-2024	Presentation	MoFA Presentation v3.pptx

2.3.2 Key Informant Interviews (KIIs)

Ten KIIs were conducted over four days: nine were held in person at VEI headquarters, and one was conducted online via Google Meet. The interviewees comprised six men and five women with various positions, including managers, coordinators, and directors representing multiple stakeholders. The Project team assisted in selecting the interviewees. Sessions were scheduled to accommodate time zones and work constraints, and all interviews were recorded for later analysis.

The interviews were semi-structured, following an interview guide based on the Evaluation Matrix while allowing flexibility to explore areas of interest in depth. Open-ended questions encouraged detailed responses, and follow-up questions clarified or expanded on important points.

2.3.3 Training Feedback Survey

As mentioned in Section 2.3, it was decided that a survey should be conducted to gather feedback from the trainees under WP2, as this was not performed during implementation and could effectively serve the purposes of both this IEE and the Project Team. Therefore, a survey form was prepared, translated into Ukrainian (with assistance from the Project Team) and floated to all 64 trainees from a list provided by the Project Team. The survey was entirely closed-ended with a mix of multiple-choice, Likert scale and yes/no questions (see Appendix 2). The Survey was kept online for 15 days, and 26 responses were received. The feedback presented in this report reflects the responses of these 26 individuals, who remain anonymous for privacy and data collection ethics. However, it can be said that all five VKs are represented.

3 Findings and Conclusions

This section presents an analysis of the IEE's findings and conclusions as per the approved Evaluation Matrix. It is organised into six sub-sections corresponding to the OECD-DAC criteria, with each relevant question from the Evaluation Matrix introduced as a sub-heading.

3.1 Relevance

3.1.1 Alignment of project objectives with the needs of Ukrainian water utilities and humanitarian goals during the conflict

The Project effectively addressed the urgent needs of VKs, primarily through the restoration and modernisation of critical infrastructure. Output indicators in the Annual Plan 2025 confirm that 100% of the €4.8 million budget was allocated to priority investments. And since all the Project's interventions were recommended by the VKs themselves, it can be said that a large part of their critical needs were addressed.

Furthermore, most investments focused on rebuilding war-damaged assets such as sewage pipes, vehicles, pump stations, and electrical systems. The need for vehicle replacements was particularly emphasised in Kherson, where operational vehicles had been stolen or destroyed. Additionally, oversized sewage systems, resulting from population displacement, led to blockages that were mitigated using sewage jetters.

Beyond restoration, the Project modernised infrastructure by replacing outdated Soviet-era pumps, upgrading electrical systems, and improving laboratory facilities. This suggests that the Project not only met immediate recovery needs but also contributed to long-term service improvements. Training on EPANET hydraulic modelling software further supported sustainability by equipping VK staff with technical skills for demand modelling.

One challenge, substantiated by multiple sources, was the delay in transferring essential equipment, such as JCB diggers, due to local council bottlenecks. This process took three months, highlighting bureaucratic hurdles that slowed implementation. Remote monitoring was critical to tracking material use, and while installations were ultimately completed, some needs appeared overstated in the initial assessments.

3.1.2 Pertinence of project design to evolving circumstances in Ukraine

The Project demonstrated significant flexibility in adapting to evolving conflict conditions. A clear example was the inclusion of vehicles, which were not initially part of the Project scope but were added following requests from VKs. Similarly, while initial coordination efforts were primarily with the Association of Water Utilities in Ukraine (Ukrvodokanalekologia), The Embassy of the Kingdom of the Netherlands – Ukraine (EKN-U) and GIZ, engagement with the WASH Cluster occurred later, indicating a phased approach to collaboration. The Dutch Ministry of Foreign Affairs was facilitative in initiating the intervention, aligning with broader diplomatic and humanitarian priorities.

The training was also adapted to conflict constraints. Combining online sessions and field visits to the Netherlands ensured practical learning despite mobility restrictions. While the hybrid training approach was largely effective, some respondents suggested that more structured follow-up and additional practical assignments could have enhanced the impact.

Another notable adaptation was the reliance on remote monitoring due to security concerns. Since VEI staff were not allowed to travel to Ukraine, local staff, the embassy, and VK representatives played a crucial role in verifying project achievements. This system functioned effectively, ensuring oversight without direct field presence.

One potential weakness in project design relates to procurement transparency. A respondent pointed out that GoLocal, a transportation and logistics service provider recommended by GIZ, was engaged without competitive bidding. However, GIZ had already undertaken this process and paid for the first four uses of GoLocal's services. While this may have been a pragmatic decision given logistical constraints, the absence of cost comparisons raises concerns about procurement best practices. That said, since GoLocal was not used extensively and the project eventually shifted to purely local procurement after the initial four procurements, the lack of cost comparisons had little to no impact on the Project's final outcome.

3.1.3 Link between water and energy, focusing on benefits to critical energy needs

The Project improved energy efficiency by upgrading pump stations and replacing inefficient and insufficient Soviet-era pumps with modern alternatives, including new energy-efficient pumps, aeration systems, and compressors. These improvements helped reduce energy consumption and improve operational sustainability, which is critical given the unstable energy supply in conflict-affected areas. Electrical system upgrades further enhanced efficiency, allowing VKs to optimise energy use.

Furthermore, the Project's focus on optimising energy use in infrastructure is evident in training planned for 2025, specifically addressing pump maintenance and energy efficiency.

However, while infrastructure upgrades inherently improve energy efficiency, the project did not explicitly report or record quantitative tracking of energy savings. This was mainly because Ukraine's unique context does not currently allow for conducting a thorough energy audit. In the future, should peace return to the region, such a study could help quantify this aspect.

3.2 Coherence

3.2.1 Internal coherence: Alignment of project components with overall objectives.

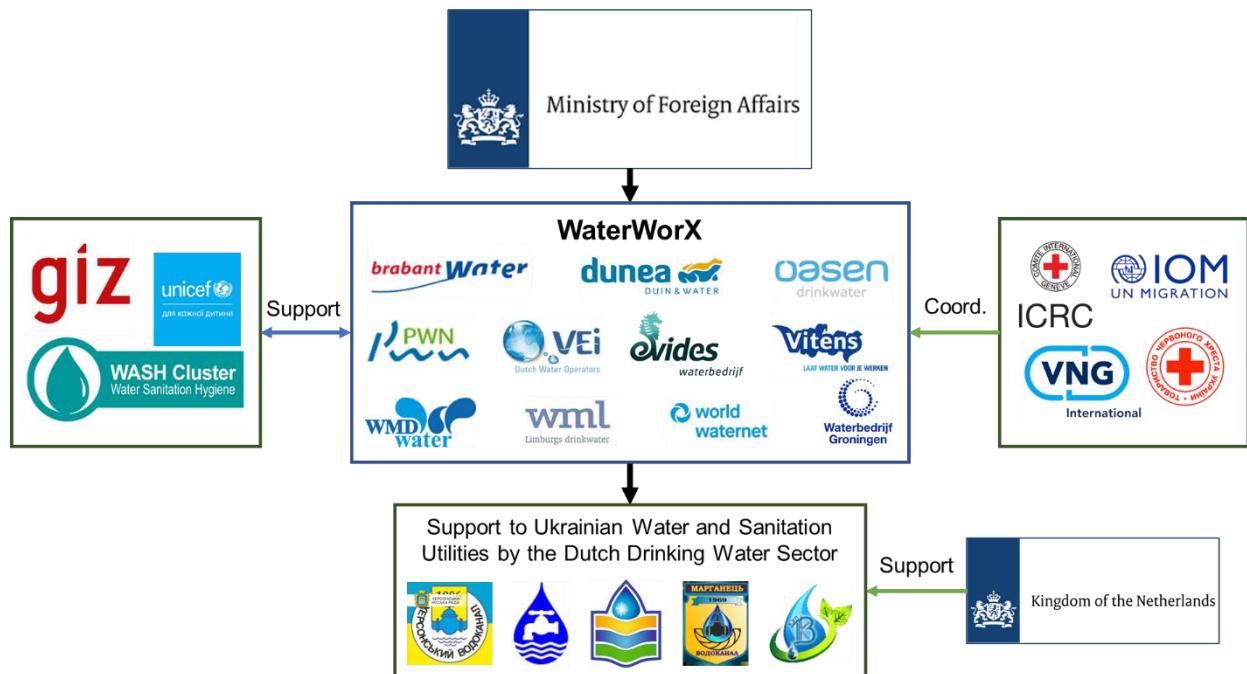
The Project was structured around three key work packages (WP1: Priority Investments, WP2: Training & Capacity Building, WP3: Long-Term Investment Plans). These components were designed to complement each other, ensuring that investments in infrastructure were supported by technical training and that long-term planning provided a roadmap for sustainability. The approach was comprehensive, addressing both immediate recovery needs and future resilience-building.

However, the coordination between these components faced some structural challenges. One of the primary concerns was the role of the City Councils in receiving and distributing assets. Due to regulations in Ukraine during the core of the Project's implementation, humanitarian aid could only be received by City Councils, which then transferred the materials to VKs. While this process was transparent under wartime conditions, it introduced additional administrative complexities. This required a three-way coordination process involving WWX, VKs, and City Councils, which made financial tracking and monitoring more cumbersome. Despite this, some interviewees noted that the transparency of the process was upheld as much as possible, although concerns remained about whether equipment could be sold after project completion (primarily vehicles). Given the circumstances, no strong enforcement mechanism exists at this point to prevent this beyond trust-based verification and the fact that most of the investments are underground or tailor-made for the respective VK. However it should be noted for future iterations of this Project, ideally in a non-conflict scenario.

Lastly, the impact of the integration of energy efficiency measures into the broader project objectives remains unclear. The extent to which these replacements contribute to measurable energy savings cannot be documented effectively at this stage given the situation on-ground. This suggests that while the components were logically aligned, a more robust monitoring

framework, had the situation allowed, could have strengthened the integration of investments with long-term operational efficiency goals and should definitely be a key focus area for Phase 2.

3.2.2 External coherence: Coordination with similar initiatives and government strategies.



The Project operated in a highly complex environment with multiple actors involved in water infrastructure and humanitarian aid. The Project sought to coordinate with external initiatives such as GIZ, UNICEF (WASH Cluster), ICRC, and IOM, with varying effectiveness.

One of the Project's key strengths was its structured engagement with the UNICEF-managed WASH Cluster. Monthly coordination meetings ensured that planned 2025 investments and training topics did not duplicate efforts by other donors. This approach was essential given the many humanitarian actors operating in Ukraine's WASH sector. However, early engagement with the WASH Cluster was limited, with WWX formally joining the coordination efforts only after initial project activities had begun. A more proactive alignment from the outset could have helped streamline efforts and avoid the possibility of redundant interventions earlier in the process.

Regarding GIZ, the organisation played a key role in developing the Project proposal and advising on implementation in the early stages. However, GIZ did not remain actively involved beyond early 2024, as its scope of coordination was intentionally limited. Although this limited engagement was by design and did not hinder project execution, it highlights an opportunity for stronger, longer-term collaboration mechanisms with other key technical partners, including GIZ. Given that GIZ currently operates separately from the WASH Cluster and runs a distinct project with different Vodokanals, a more structured partnership could enhance knowledge-sharing and implementation efficiency for all in the region, ensuring better alignment between parallel initiatives in Ukraine's water sector. A concept that is arguably one of the Development Sector's key objectives—fostering sustained partnerships for greater impact.

Coordination with the International Organization for Migration (IOM) and the International Red Cross (ICRC) was also ongoing. WWX maintained online meetings with both organisations to

ensure activities were not duplicated, particularly in **Kherson** and **Nikopol**, where ICRC actively supported the VKs. However, the financial planning and asset transfer process required further refinement. For example, Ukrainian regulations allowed only City Councils to officially receive humanitarian aid, after which materials and equipment were formally transferred to VKs and recorded on their balance sheets. To ensure compliance, WWX conducted local verification visits to confirm that assets remained in use by the VKs and had not been resold or repurposed. This procedural **workaround** was necessary to compensate for initial regulatory challenges, ensuring that the intended recipients retained full operational control of the assets. A potential risk identified was the military's sequestration of heavy digging materials for war efforts, though this had not occurred at the time of reporting.

The Project's engagement with Dutch stakeholders was a notable aspect of external coherence. This was the first WWX project to involve all 10 Dutch drinking water companies, highlighting the Project's unique structure. Furthermore, WWX partnered with VNG International on an RVO-funded initiative under the Ukraine Partnership Facility (UPF) program, which began in April 2024 and will continue through 2025 in the Kherson region. This suggests the Project was strategically positioned within broader Dutch-funded humanitarian and development efforts.

3.3 Effectiveness

3.3.1 Restoring water services, building capacity, and developing investment plans

The Project played a critical role in restoring essential water services, enhancing the technical capacity of the VKs, and formulating long-term investment plans. A significant portion of the Project involved rebuilding infrastructure that was either destroyed or severely damaged during the war. In several cases, this entailed replacing sewage pipes, repairing pump stations, upgrading laboratories, and modernising electrical systems. Some VKs, such as Kherson, lost operational vehicles due to looting. The Project responded by procuring several key vehicles including sewage trucks, excavators, and maintenance vehicles (see Table 3.1).

Table 3.1: List of Vehicles Procured for the Project

Vodokanal	Vehicle Name/Type	Qty
Pokrov	Repair Bus (Netherlands)	1
	Repair Bus (Ukraine)	2
	Backhoe loader with trencher	1
	Mini excavator Bobcat	1
	Sewer Jetter	1
Nikopol	Backhoe loader JCB 3CX Contractor	2
	Repair Bus	3
	Vacuum sewer tanker combi jetter	1
Marganets	Backhoe loader	2
	Sewer Tanker	1
	Dump truck with manipulator	1
	Repair Bus	3
Kramatorsk	Repair Bus	2
	Excavator JCB 3DX	1
Kherson	Passenger Bus second-hand	1

Another key intervention was addressing blockages in oversized sewage systems caused by population displacement, which reduced wastewater flow. The Project mitigated this issue by

deploying sewage jettors to improve system functionality. In addition, outdated Soviet-era pumps were replaced with modern, energy-efficient alternatives, contributing to improved reliability of water services.

On the capacity-building front, training was provided on several topics, as selected by the VKs, including hydraulic modelling (EPANET), NRW management and infrastructure maintenance. However, because of security concerns, most training sessions were conducted remotely or in the Netherlands. While effective, stakeholder feedback suggested that structured follow-up mechanisms, such as on-the-job mentorship and periodic evaluations, could further enhance training outcomes.

In terms of investment planning, the Project is on track for successfully completing the planned long-term investment strategies for the five VKs. These plans, led by Royal HaskoningDHV (RHDHV) and the Rebel Group, align well with potential financiers such as the European Investment Bank (EIB), Swedfund, and the World Bank. Despite this achievement, implementing these plans remains contingent on resolving conflict in the region and securing future funding, making their long-term impact uncertain.

3.3.2 Verification of outputs and outcomes against performance indicators

Verifying project outputs and outcomes was a key challenge due to the complexities of operating in a conflict zone, reliance on remote monitoring, and the involvement of multiple stakeholders in procurement and service delivery. Despite these challenges, the Project established multiple verification mechanisms to track investments, training progress, and service restoration. This section examines how these verification processes were implemented and evaluates their effectiveness in ensuring the Project met its intended objectives.

3.3.2.1 Verification of Outputs (Hardware, Training, and Investment Planning)

The Project developed clear output indicators to track the procurement of equipment, the implementation of training sessions, and the development of investment plans. However, the ability to verify these outputs was constrained by the realities of war, including bureaucratic hurdles, security-related delays, and the need for city council approvals before VKs could receive assets.

One of the most critical aspects of the Project was the procurement and installation of essential hardware in the five targeted VKs: Pokrov, Nikopol, Marganets, Kramatorsk, and Kherson. By Q3 2024, nearly 70% of the total planned investments had been realized, with full completion expected in 2025. The verification process relied on several mechanisms, including photographic documentation, acceptance certificates, and visits by local coordinators to confirm that equipment was delivered and put to use. Additionally, coordination with the WASH Cluster played a role in ensuring that the Project's investments did not overlap with those of other donors. However, the involvement of city councils in receiving assets complicated direct verification, and while no evidence of misappropriation was found, minor concerns remain regarding whether assets could be resold after the Project's completion.

Training and capacity-building efforts also played a significant role in the Project, with 144 training sessions planned across various technical areas, including billing, water metering, NRW management, hydraulic modelling, asset management, and SCADA systems. As of Q3 2024, 120 sessions had been completed, indicating strong progress toward achieving the training objectives. Verification mechanisms included training completion reports. While these methods confirmed that training activities were conducted as planned, some challenges emerged. Remote training, though necessary due to security concerns, limited hands-on experience for participants. Furthermore, there was no systematic follow-up to track long-term knowledge retention and how well trainees could apply their new skills in daily operations. As

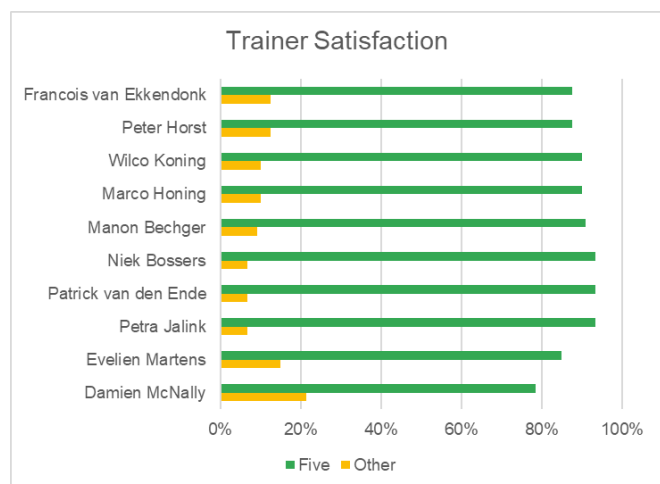
mentioned in Section 2.3.3, a Training Feedback Survey was conducted as part of this IEE. As shown in Visual 3.1 below, overall trainees were highly satisfied with the training they received with the vast majority giving maximum scores of “5” i.e., “Very Good” (71% to 100%).



Visual 3-1: Training Satisfaction

Similarly, satisfaction with trainers was also reportedly high with 80% to 100% of trainees scoring the trainers an overall score of “5” (see Visual 3.2)

Investment planning was another critical component of the Project, aimed at developing structured financial and infrastructure strategies for the VKs. By Q4 2024, 62% of investment planning activities had been completed, with the finalisation of investment plans and VK approvals nearing completion. Verification of this work was carried out through milestone-based reporting, documentation of approvals, and coordination with potential financiers such as Swedfund, EIB, and the World Bank. However, concerns remain about the implementation of these plans beyond 2025, particularly as securing long-term funding for post-war reconstruction remains a significant challenge. While it is understood that RHDHV's current contract will conclude in March 2025, their potential role in the implementation of WP3 remains uncertain. RHDHV may continue its involvement through winning a competitive bidding process for the next phase, given its prior experience and understanding of the investment planning framework developed in the first phase of the project. Ensuring continuity in expertise would be useful when executing long-term investment plans and conducting feasibility studies for infrastructure projects—especially if the conflict continues, as a proven understanding of the operational and security challenges in Ukraine would be essential for effective project implementation.



Visual 3-2: Satisfaction with Trainer

3.3.2.2 Verification of Outcomes (Restored and Improved Water & Sanitation Access)

The ultimate measure of the Project’s success was its ability to restore and improve access to water and sanitation for affected populations. By Q3 2024, over 192,200 people had benefited

from improved services, with the Project aiming to reach a final target of 342,200 people by early 2025. Verification of these outcomes relied on VK service records, comparisons between pre-war and post-project service levels, and coordination with the WASH Cluster to ensure accurate reporting.

Service restoration was well-documented in Pokrov, Nikopol, Marganets, and Kramatorsk, where data on the number of people receiving improved access was available. However, Kherson presented a challenge, as ongoing security risks limited the ability to verify service improvements. While outcome tracking was generally effective, the Project lacked automated monitoring systems such as SCADA and remote sensors, making it difficult to measure real-time improvements in water supply reliability, water quality, and energy efficiency. Additionally, while the Project consolidated different outcome categories—such as restored, improved, and sustained access—into a single metric, this simplification reduced the ability to distinguish between short-term recovery efforts and long-term stabilisation of services.

Despite the robustness of the Project's verification mechanisms, several challenges were identified. The reliance on manual verification methods, such as photographic evidence, coordinator visits, and self-reporting by VKs, meant that data collection was not as rigorous as it could have been with automated tracking systems. The involvement of city councils in asset transfers added an additional layer of bureaucracy, which, while necessary for compliance with Ukrainian regulations, made it more difficult to ensure full control over the use of procured equipment. Training follow-up mechanisms were also insufficient, as no structured system was in place to measure how effectively trainees applied their new skills over time. Finally, the lack of real-time monitoring tools limited the ability to track improvements in service delivery, particularly in terms of supply continuity, water quality, and energy efficiency.

3.3.3 Effectiveness of the WWX consortium in emergency response

The WWX consortium demonstrated strong adaptability and responsiveness in handling emergency conditions, making key adjustments to procurement, monitoring, and project execution strategies. The initial project scope did not include vehicle procurement, but this was later adjusted based on VKs' needs, demonstrating the consortium's ability to pivot in response to evolving requirements.

One of the most notable adaptations from a conventional Water Operator Partnership (WOP) was the shift to remote project monitoring. Since VEI staff could not travel to Ukraine due to security risks, the Project relied on a local coordinator, embassy officials, and VK staff to track progress. While this approach was necessary, it also introduced verification challenges, as documentation had to be supplemented with on-the-ground trust-based assessments.

Procurement processes had to be adjusted to comply with Ukrainian regulations, requiring City Councils to receive humanitarian aid before being transferred to VKs. This workaround ensured compliance but resulted in bureaucratic delays of up to three months for certain equipment transfers. A minor concern raised by stakeholders was that some procurement decisions lacked transparency, particularly regarding the selection of Go-Local as a transport provider. However, since GoLocal was only used for the first four procurements—covered by GIZ—and the project later transitioned to purely local procurement, the lack of cost comparisons had little to no impact on the project's final outcome.

A key distinction between the WWX-U approach and a traditional WOP was its lean operational model and remote-based interventions. At first glance, the WWX-U model proved to be cheaper than a WOP, as it did not rely on long-term, on-site technical support from international partners or the living costs of a resident project manager. Instead, it was structured as a beneficiary-led model, where VKs identified their own needs rather than having them dictated by donors.

However, this flexibility came at a cost. While eliminating full-time international staff reduced direct expenses, the absence of on-site presence resulted in inefficiencies, as work took longer to complete remotely. Without immediate access to technical experts in the field, certain processes required extended back-and-forth communication, which ultimately increased the time and effort needed to implement activities. Additionally, the remote working structure required significantly more administrative effort than initially expected, further compounded by the bureaucratic complexities of operating in an ex-Soviet country. This placed additional strain on an already lean project team, making it difficult to deliver the project with 100% effectiveness.

Despite these challenges, the WWX-U model was particularly suited to Ukraine's wartime conditions, allowing the Project to progress despite security risks and general uncertainty. Some interviewees suggested that while a traditional WOP would have provided greater hands-on capacity-building, it would have been far more expensive and difficult to implement under the current circumstances.

A key takeaway from this experience is that the WWX-U model could serve as a new approach for other crisis/conflict settings where rapid infrastructure support is needed, but traditional WOPs are impractical. A hybrid model could be implemented, where WWX-U-style flexibility is used for initial recovery, followed by a structured WOP approach for long-term sustainability.

3.3.4 Stakeholder perspectives on results, challenges, and future partnerships

Stakeholders generally viewed the Project as a success, particularly in its ability to deliver emergency infrastructure, provide technical training, and support long-term planning. VKs appreciated the Project's responsiveness, particularly in addressing urgent needs such as equipment replacement and operational resilience.

However, several challenges and areas for improvement were identified. One of the most common concerns was the lack of structured follow-up mechanisms for training programs. While the online and in-person sessions were valuable, some interviewees felt that additional mentorship programs, practical assignments, and post-training evaluations would have improved knowledge retention. Even though limited resources forced the Project team to prioritise, measures to ensure the retention of knowledge are key aspects of any capacity-building exercise, especially given the plans set out in WP3. However, based on the feedback survey conducted for the IEE, most trainees were highly satisfied with the training under WP2. See Visual 3.1.

Coordination with other donors and humanitarian organisations was generally effective, though some interviewees felt there was room for improvement in sustained collaboration. While GIZ was involved in the planning stages by design, some stakeholders believed its engagement could have continued into project implementation, particularly given its active role in the region. However, it can be argued that since the GIZ project primarily worked with VKs located away from the front lines, the scope for direct collaboration during implementation was limited. Regardless, the WASH Cluster, the primary partner for collaboration) played a key role in preventing duplication of efforts, and while engagement with IOM and other actors evolved over time, early-stage coordination could have been more structured.

A key takeaway from stakeholder feedback was the importance of long-term sustainability. Many VKs expressed concern about the financial viability of post-war investments, noting that while the Project provided a strong foundation, continued donor engagement will be necessary to implement the long-term investment plans fully.

3.4 Efficiency

The Project's efficiency was shaped by the constraints of operating in an active conflict zone, which required strategic resource allocation and adaptive remote implementation strategies. This section evaluates cost-efficiency in resource utilisation and the effectiveness of remote implementation, including procurement, communication, and logistics.

3.4.1 Cost-efficiency in resource utilisation under conflict constraints

The Project successfully balanced cost-efficiency with the urgency of restoring water services, ensuring that all requested materials and services aligned with VKs' needs. Unlike conventional donor-driven models, where investments are often pre-determined, this project allowed VKs to define their own procurement priorities, ensuring minimal resource waste and optimal budget utilisation.

The lean project structure was a key factor contributing to cost efficiency, which avoided excessive administrative layers. The Dutch Ministry of Foreign Affairs (MoFA) provided VEI with significant autonomy, allowing procurement and investment decisions to be made quickly and pragmatically rather than being tied to lengthy bureaucratic approvals. This flexibility ensured that funds were allocated efficiently, even in an unpredictable war context.

The Project also benefited from a cost-saving approach to training, where the majority of sessions were conducted remotely. While this reduced travel and logistical costs, the long-term sustainability of this model remains uncertain, as hands-on training elements were limited. To address this, future phases include plans for a national training centre in Lviv, which will enable localised, cost-effective knowledge transfer without reliance on international trainers.

One notable challenge was staffing constraints, which impacted verification efforts and post-training follow-up. Some interviewees noted that, while the Project operated efficiently within its budget, the limited number of personnel resulted in gaps in evaluation and oversight. Future projects could improve cost-efficiency not by increasing budgets, but by strategically allocating personnel to critical functions like training verification and long-term monitoring.

3.4.2 Efficiency of remote implementation, including communication, monitoring, and logistics

Given the security risks and logistical challenges of working in Ukraine, remote implementation was unavoidable. The Project successfully leveraged online training, digital communication platforms, and local procurement partners to ensure operational continuity.

3.4.2.1 *Effectiveness of remote training and knowledge transfer*

The focus on remote training allowed the Project to deliver the majority of planned sessions on schedule. However, topics requiring hands-on experience, such as SCADA operations and pump maintenance, were more difficult to teach remotely. Some practical training was conducted in the Netherlands to mitigate this limitation, but this solution is not scalable, especially in the long run.

Furthermore, the planned national training centre in Lviv represents a long-term investment in sustainable knowledge transfer, reducing dependency on remote training while keeping costs manageable.

3.4.2.2 *Efficiency of procurement and logistics (GoLocal and in-country suppliers)*

A significant achievement of the Project was its efficient in-country procurement strategy, with the majority of investments sourced directly from Ukrainian vendors, who delivered materials to the Vodokanals. This approach minimised logistical hurdles and ensured compliance with

Ukrainian regulations. While GoLocal did play a significant role in transporting investments from the Netherlands to Ukraine in the beginning, the Project's real success lay in reliance on local procurement. This approach strengthened supply chain resilience, reduced dependency on external transport services, and enabled timely deliveries despite wartime restrictions.

Verification mechanisms included:

- Acceptance certificates signed by VKs to confirm receipt of materials.
- Site visits by local coordinators to verify equipment installation.
- Coordination with the WASH Cluster to ensure no duplication of investments.

This hybrid verification model (documentation + physical checks) was effective in preventing asset misallocation, though it was labour-intensive and entirely dependent on the VK's cooperation. A potential improvement would be the introduction of digital tracking systems to streamline verification.

Despite its effectiveness, procurement was slowed by the requirement that city councils formally receive materials before passing them on to VKs. While this step ensured compliance with Ukrainian regulations, it created unnecessary delays. Refining this process in future projects could reduce bureaucratic bottlenecks without compromising transparency, especially now that laws and regulations have changed in the first quarter of 2025 (See Paragraph 2 of Section 3.5.1).

3.4.2.3 Financial flexibility and decision-making

A key enabler of efficiency was MoFA's trust in VEI, which allowed for rapid decision-making without the constraints of traditional donor oversight. This autonomy ensured that resources were allocated based on real-time needs rather than pre-determined assumptions. Additionally, the alignment among Dutch water companies within the Project consortium facilitated consensus-driven financial planning, reducing administrative inefficiencies.

3.5 Impact

The impact of the WWX project extends beyond its immediate goals of restoring infrastructure and improving operational capacity. While the project effectively addressed critical needs, it also triggered long-term institutional shifts within VKs and produced positive and negative ripple effects throughout the Ukrainian water sector.

3.5.1 Transformational Impact on VKs' Resilience and Service Delivery

A key outcome of the project was its role in transforming how VKs plan, manage, and secure funding for their infrastructure needs. Historically, many VKs relied on ad-hoc maintenance rather than structured investment planning. Through WWX they were introduced to long-term strategic planning processes, ensuring they could better assess their needs, allocate resources effectively, and engage with international funding mechanisms.

Another major transformation was the shift toward greater financial and legal autonomy for VKs. Initially, Ukrainian legislation required humanitarian aid to be channelled through municipalities, limiting VKs' ability to procure and implement assistance efficiently. However, by Spring 2025, a policy shift allowed VKs to apply for and receive humanitarian aid directly, significantly reducing bureaucratic delays and enabling them to manage resources more independently.

Furthermore, the project accelerated the modernisation of VK operations, aligning them more closely with European water and sanitation standards. While this was not an explicitly stated Project objective, VEI's strategy was to ensure that investments met the required specifications to align with EU drinking water directives. As a result, the war itself became a catalyst for change, prompting VKs to adopt EU-aligned best practices in infrastructure management, governance, and financial oversight. The exposure to European utilities and

technical advisors also broadened their perspective, positioning them for future integration into regional and international water sector networks.

Despite these advancements, challenges remain in sustaining these gains. Many VKs still face staff shortages and skill gaps, which hamper the long-term effectiveness of newly implemented systems. Additionally, while investment plans were developed, securing sustainable funding beyond donor support remains a key concern. Without clear local financing mechanisms, there is a risk that modernisation efforts may stall once external support diminishes. Finally, while some VKs embraced EU-aligned standards, others saw these reforms as externally driven rather than organically developed, leading to varying levels of enthusiasm for long-term institutional changes.

3.5.2 Unintended Effects on the Water Sector and Communities

Beyond its core objectives, the project had several unintended consequences—both positive and negative—on the broader water sector and local communities.

3.5.2.1 *Positive Unintended Effects*

One of the most notable positive effects was the development of new procurement and financial pathways. Due to banking restrictions related to the war, many international financial institutions hesitated to process transactions linked to Ukraine, fearing potential risks related to sanctions, corruption, or indirect funding of Russian entities. These challenges forced the project to innovate alternative procurement strategies, which have now been adopted for other donor-funded initiatives, creating a more resilient financial framework for future water sector investments.

Another unexpected benefit was the improvement in VKs' internal decision-making processes. The project required VKs to prioritise investments, collect data, and plan their resource allocation more strategically. While this was originally a project management requirement, it had a lasting impact on how VKs approach planning and operational oversight, reducing their dependence on external consultants and improving their ability to assess infrastructure needs independently.

Additionally, the project led to a shift in workforce dynamics within the Ukrainian water sector. With increased exposure to EU standards and best practices, Ukrainian engineers and technicians have become more competitive in the international job market, making the water sector more attractive for skilled professionals.

3.5.2.2 *Negative Unintended Effects*

Despite its successes, the project also introduced several challenges that had not been anticipated. One significant issue was the political sensitivity surrounding the Build Back Better (BBB) principles, which were integrated into investment planning. While BBB aims to enhance sustainability and climate resilience, some VKs viewed it as an externally imposed priority that did not always align with their immediate needs. This creates tensions (minor but palpable) between donor expectations and local preferences, with some VKs preferring practical, short-term solutions over longer-term sustainability initiatives.

Finally, the project placed a heavier administrative burden on VKs than initially expected. By giving VKs more control over procurement and reporting, the project empowered them with greater autonomy but also required them to handle complex financial and logistical processes that were previously managed externally. While this built capacity, it also stretched the already limited administrative resources of many VKs, sometimes slowing down decision-making rather than streamlining it.

3.6 Sustainability

The Project's sustainability depends on the ability of VKs to maintain and expand the gains made under the program, as well as the broader sector-wide reforms that will shape Ukraine's future water governance. This section examines the likelihood of sustaining project outcomes post-completion and the project's long-term contribution to resilience in the Ukrainian water sector.

3.6.1 Likelihood of Sustaining and Expanding Project Outcomes Post-Completion

The ability of VKs to sustain project outcomes hinges on three main factors: operational autonomy, financial sustainability, and continued technical support. While the project has made significant progress in enhancing VKs' capacity to manage infrastructure and procurement independently, long-term sustainability remains uncertain due to structural and contextual challenges.

A key sustainability risk is the limited availability of structured, long-term funding. While investment plans have been developed, securing post-project financing remains challenging, particularly given the war's impact on Ukraine's economic stability. Donor support will likely continue, but without a clear financing framework, there is a risk that VKs will struggle to implement large-scale improvements beyond emergency restorations.

Another concern is maintaining remote implementation models without direct on-the-ground presence. The use of remote tools, such as RealWear VR helmets for visual communication, may help bridge this gap. Still, the lack of site visits due to insurance limitations has constrained long-term capacity-building efforts. While VKs have demonstrated strong commitment and adaptability, some of the more complex operational improvements may not be sustained without continued external technical support.

Capacity-building efforts have had mixed sustainability prospects, especially given the limited time frame of the Project. On the one hand, training was designed to be practical and aligned with VK's needs, ensuring immediate applicability. However, the absence of in-country training facilities has meant that most technical training has relied on remote delivery or external visits to the Netherlands, which is not a scalable long-term solution. The proposal for a national training centre in Lviv represents a crucial step toward making training more accessible and sustainable. Still, its implementation will depend on funding, institutional support and an end to the conflict.

Despite these challenges, the project's alignment with broader EU accession goals provides a strong sustainability driver. Many of the reforms introduced—such as energy efficiency measures, NRW reduction strategies, and structured investment planning—are aligned with EU water sector standards, increasing the likelihood that they will be institutionalised over time. However, VKs' enthusiasm for EU-driven reforms varies, and sustainability will ultimately depend on whether Ukraine's national policies continue to push for alignment with European standards.

3.6.2 Contribution to long-term resilience in Ukraine's water sector

Beyond individual VKs, the project has contributed to sector-wide resilience by triggering broader shifts in water sector governance and infrastructure management. One of the most significant impacts has been accelerating Ukraine's adoption of EU water sector standards, particularly under the BBB framework. This reform process, though initially donor-driven, has created long-term momentum for improving water and sanitation governance across Ukraine.

An important element of resilience-building has been the integration of energy efficiency and NRW reduction strategies into daily operations. The project successfully embedded these practices within VK workflows, ensuring that they are not just short-term crisis responses but part of a systemic shift in operational management. The training provided in these areas has already been applied in real-time operations, suggesting that VKs have internalised these practices, increasing their likelihood of long-term sustainability.

Another key contribution has been the expansion of collaborative networks. The project has brought together the Dutch water utilities under a single initiative, creating a unique platform for international knowledge exchange. Additionally, close collaboration with IOM, VNG and the Red Cross have strengthened technical cooperation, with spillover effects on other water sector initiatives in Ukraine. The successful pilot of a leak detection program in Kramatorsk, funded by the Red Cross, is an example of how WWX-U innovations have influenced parallel sector efforts.

However, despite these advances, challenges remain in ensuring that resilience-building efforts continue beyond the Project's lifespan. The absence of a well-defined national Operations & Maintenance (O&M) framework remains a key barrier. While VKs have adopted new technical practices, ensuring continued access to spare parts, maintenance services, and equipment upgrades will require a more structured supply chain. Without stronger domestic infrastructure for equipment servicing, VKs may struggle to sustain the improvements made under the project.

Finally, the war itself remains the biggest threat to sustainability. While the project has helped VKs operate under extreme conditions, long-term resilience depends on broader political and economic stability. If the war continues to disrupt infrastructure, VKs may be forced to focus on emergency repairs rather than sustained modernisation efforts, potentially reversing some of the progress made under the project.

4 Recommendations

The WWX-U project was implemented under highly abnormal conditions due to the war. While the project successfully adapted to security risks, logistical constraints, and remote implementation challenges, these were temporary solutions rather than ideal models for water sector development.

Moving forward, two parallel approaches must be considered:

1. Short-term measures for sustaining interventions in an ongoing conflict scenario.
2. A long-term transition back to a conventional WOP model once security conditions permit.

The recommendations below are structured around this dual approach: addressing war-time constraints while preparing for a return to full-scale water sector development post-war.

4.1 Improving remote management for future projects based on lessons learned

As discussed, remote implementation was not a deliberate design choice but a necessary adaptation to war conditions. Under normal circumstances, the project would have functioned as a hands-on WOP initiative, with Dutch and Ukrainian utilities working together directly. However, due to security risks, a remote model was required, bringing challenges in monitoring, verification, and training.

While this remote approach was necessary under current conditions, future projects should consider how to refine crisis-adapted models while maintaining the ability to transition back to traditional WOP models when security improves.

1. Enhancing Remote Implementation for War Contexts

- a. Expand Third-Party Verification Networks: Future projects should engage local NGOs, universities, and neutral monitoring agencies to provide independent verification of project outputs, reducing reliance on self-reported data.
- b. Strengthen Digital Monitoring Tools: While RealWear VR helmets were tested, wider adoption of remote visual inspection tools is needed. Future projects should expand the use of remote video assessments and blockchain procurement tracking to enhance monitoring.
- c. Design Training to Bridge War and Post-War Needs: Remote training worked well for theory, but practical learning was limited. A hybrid phased approach should be introduced, where trainings start remotely but transition to hands-on workshops once conditions allow.

2. Transitioning Back to In-Person WOP as Soon as Conditions Allow

- a. Restore Direct Dutch-Ukrainian Utility Collaboration: As soon as security conditions permit, the project should immediately pivot back to a full WOP structure, allowing Dutch and Ukrainian utilities to work side by side.
- b. Reinstate On-Site Technical Support: Remote verification should be phased out in favour of direct site inspections, technical training workshops, and in-person support for VKs.
- c. Normalize Procurement and Logistics: Banking restrictions, import delays, and cross-border procurement challenges should be reassessed post-war to allow a return to standard, more efficient procurement mechanisms.

4.2 Feasibility of follow-up programs and priority areas for future support

With Ukraine's water sector facing ongoing wartime challenges while also preparing for post-war reconstruction, follow-up programs should be designed to balance short-term crisis response with long-term resilience-building.

1. Short-Term: Sustaining Water Services During the Conflict

- a. **Prioritize Energy Resilience:** Given Ukraine's unstable power grid, future programs must focus on decentralized energy solutions such as solar-powered pumping stations and battery storage.
- b. **Support Cross-Border Procurement Pathways:** Since banking restrictions and supply chain disruptions have delayed equipment delivery, projects should establish pre-approved supply routes with trusted vendors and financial institutions.
- c. **Continue Remote Training While Establishing In-Country Training Hubs:** Remote learning was a temporary solution, but future programs should set up a decentralized network of training hubs within Ukraine to ensure long-term capacity-building.

2. Long-Term: Preparing for Full Reconstruction Post-War

- a. **Transition Investment Planning from Crisis Response to Structured Growth:** While VKs now have investment plans, they must be converted to feasibility studies by capitalising on grants such as the Swedfund and then formalised into Ukraine's national water governance framework so they can access EU and World Bank funding.
- b. **Strengthen Ukrainian Water Sector Self-Sufficiency:** Future programs must reduce reliance on international donors by integrating financial sustainability measures, such as municipal co-funding, PPPs and access to international credit lines.
- c. **Expand EU Standards Alignment for VKs:** Currently, only some VKs are actively adopting EU standards. Follow-up programs should introduce a structured compliance framework to harmonise water quality, financial transparency, and governance models.

4.3 Implementing and sustaining WP3 long-term investment plans

The long-term investment plans (WP3) developed under WWX represent one of the most significant legacies of the project. However, moving from planning to execution will require overcoming both war-time constraints and post-war financial hurdles.

1. Short-Term: Keeping Investment Plans Active During the War

- a. **Protect Key Infrastructure Investments from Conflict Risks:** Some investment projects may need to be relocated or restructured to avoid destruction. This requires flexible investment planning that can adjust to changing security conditions.
- b. **Ensure Ongoing Technical Support for VKs:** Many VKs still lack experience in executing large-scale infrastructure projects. Until a WOP model is reinstated, dedicated project management mentorship should continue remotely.
- c. **Develop an Interim Fund for Small-Scale Investments:** Until large-scale financing is secured, smaller grants for urgent, high-impact projects such as leak reduction and NRW management should be made available.

2. Long-Term: Transitioning from Investment Plans to Full Implementation

- a. Secure Sustainable Financing Models: Many VKs lack access to credit, so investment plans should be backed by co-funding agreements with municipalities, access to EU Green Bonds, and international credit guarantees.
- b. Expand Regional Coordination of Investment Execution: Instead of implementing projects in isolation, VKs should coordinate with national infrastructure agencies and the energy sector to ensure integrated development.
- c. Monitor and Adjust Investment Plans to Post-War Realities: Since investment planning was done in a crisis context, a rolling review mechanism should be introduced to ensure plans remain aligned with post-war realities.

Appendix 1: Evaluation Matrix

Evaluation Criteria	Evaluation Questions	SMART Indicators	Data Sources	Methods
Relevance	1. To what extent are the Project's objectives aligned with the urgent needs of Ukrainian VKs?	<ul style="list-style-type: none"> • % of critical needs identified by VKs addressed through project interventions. • Number of interventions aligned with immediate and strategic priorities. 	Annual report, Pictorial evidence, Logical framework, Audit report	Document review, KIIs
	2. How effectively did the Project adapt its design to the evolving conflict situation?	<ul style="list-style-type: none"> • Number of adjustments required to adapt investments and training plans based on conflict-related challenges. • % of adjustments to investments and training plans based on conflict-related challenges completed successfully. • Time taken to revise and implement changes after identifying needs. 	VEI reports, VK feedback, Annual plan.	KIIs, Case studies
	3. How does supporting water infrastructure benefit the energy sector?	<ul style="list-style-type: none"> • Number of energy-efficient systems installed or upgraded. 	Annual report, VK feedback	Document review, KIIs
Coherence	4. How well do project components integrate to achieve the objectives?	<ul style="list-style-type: none"> • Number of interlinked activities between Work Packages (WP1, WP2, WP3). • Number of integrated deliverables (e.g., investments coupled with relevant training). 	Logical Framework, Quarterly progress reports/updates, Annual Report	Document review, KIIs
	5. How effective was coordination with external initiatives (e.g., GIZ, ICRC, WaSH Cluster)?	<ul style="list-style-type: none"> • Number of coordination meetings with external agencies. • % of investments or training avoiding duplication with other actors 	Meeting minutes, Quarterly progress reports/updates, WaSH Cluster Database	Document review, KIIs
Effectiveness	7. To what extent were objectives met in restoring services, building capacity, and preparing investment plans?	<ul style="list-style-type: none"> • % completion of short-term investments (Batch 1 and Batch 2). • Number of participants completing training sessions (disaggregated by gender and VK). • Interviewee satisfaction with training dissemination (rated on a 1-5 scale). • % of work completed against execution plan for the development of Long-Term Investment Plans. 	Logical Framework, Training completion reports	Document review, KIIs
	8. How accurately and reliably can achievements be verified remotely?	<ul style="list-style-type: none"> • % of deliverables validated through remote systems (e.g., head cameras, photo documentation). 	Monitoring reports, LPC feedback	Remote validation, Document review, KIIs

Evaluation Criteria	Evaluation Questions	SMART Indicators	Data Sources	Methods
		<ul style="list-style-type: none"> Number of quarterly investment condition reports submitted. 		
	9. How effective was the WWX consortium's support in an emergency context?	<ul style="list-style-type: none"> Stakeholder satisfaction score on the support effectiveness (scale 1-5). % of VKs reporting operational improvement post-support. 	Stakeholder consultations, Training feedback forms	KIIs
	10. What is the perception of stakeholders regarding results, challenges, and lessons learned?	<ul style="list-style-type: none"> % of stakeholders satisfied with project outcomes. Number of recommendations documented for future projects. 	Stakeholder consultations	KIIs
Efficiency	11. How cost-efficient was the implementation?	<ul style="list-style-type: none"> Cost per beneficiary served with improved water or sanitation services. % of budget spent vs. allocated for each Work Package. 	Financial reports, Procurement records	Budget analysis, Cost-benefit review
	12. How well did remote strategies (e.g., online training, GoLocal logistics) work?	<ul style="list-style-type: none"> % of planned online training delivered on schedule. Number of successful investment deliveries facilitated by GoLocal. 	GoLocal contracts, Training reports, Case studies	Document review
	How well was in-country procurement implemented?	<ul style="list-style-type: none"> Number of contracts with suppliers How many invoices paid within 30-days 	Procurement records VEI SAP system	Document review Database query
Impact	13. What has been the Project's impact on resilience and access to services?	<ul style="list-style-type: none"> Number of people with restored or improved access to water and sanitation services. % of infrastructure upgrades enhancing service reliability. 	Logical Framework, Progress reports	Document review, KIIs
	14. Were there unintended consequences (positive or negative)?	<ul style="list-style-type: none"> Number of unintended consequences identified and addressed. Stakeholder feedback on unexpected outcomes (positive/negative). 	Stakeholder consultations	Case studies, KIIs
Sustainability	15. How likely are improvements to be sustained post-project?	<ul style="list-style-type: none"> Number of VKs with developed operational emergency and BAU maintenance plans in place. % of training participants applying new skills six months post-training. 	VK reports, Stakeholder consultations	Document review, KIIs
	16. How well did the Project build long-term resilience?	<ul style="list-style-type: none"> Number of climate-resilient measures included in the Project's interventions. % of infrastructure improvements integrated with Build Back Better principles. 	Logical Framework, WP3 documentation	Document review, KIIs

Appendix 2: Training Feedback Survey

Опитування щодо оцінки навчання/ семінарів

Це опитування щодо задоволеності навчанням/семінарами проводиться в рамках оцінки проекту "Підтримка українських підприємств водопостачання та водовідведення голландським сектором питної води". Зверніть увагу, що це опитування є конфіденційним та анонімним, і ми не будемо згадувати ваше ім'я або посаду у нашому звіті. Надану вами інформацію буде використано виключно для оцінки прогресу проекту. Опитування складається з 11 питань, розділених на три розділи. Його заповнення займе не більше 10 хвилин.

* Indicates required question

1. Email *

1. Інформація про учасників

Цей розділ збирає основну інформацію про учасників, включаючи ім'я, організацію та роль, щоб зрозуміти контекст участі у тренінгу.

2. Ім'я та Прізвище респондента *

3. Організація *

Mark only one oval.

- Херсон
- Краматорськ
- Київ
- Марганець
- Нікополь
- Покров
- Проект ВНГ

4. Посада/роль *

5. Яке навчання ви відвідали? *

Check all that apply.

- Онлайн-тренінг з управління розподільчими мережами водопостачання – Дам'єн Макналлі
- Онлайн-тренінг з гідравлічного моделювання EPANET – Евелієн Мартенс
- Онлайн-тренінг з управління активами – Петра Ялінк, Патрік ван ден Енде, Нік Боссерс
- Офлайн-тренінг у Нідерландах з управління стічними водами – Манон Бехгер
- Офлайн-тренінг у Нідерландах з автоматизації SCADA та управління активами КОС – Марко Хонінг та Вілко Конінг
- Онлайн-тренінг з онлайн управління активами – Петер Хорст та Франсуа ван Еккендонк

2. Оцінювання навчання

Цей розділ призначений для збору відгуків щодо якості та ефективності навчання, включаючи зміст, подачу та актуальність для вашої роботи.

6. Загальна оцінка навчання *

Mark only one oval per row.

	1 - Погано	2 - Задовільно	3 - нейтрально	4 - добре	5 - Відмінно
Як ви оцінюєте навчання загалом?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. Зміст та Структура курсу *

Mark only one oval per row.

	1 -Повністю не згоден	2 - не згоден	3- Нейтрально	4- Згоден	5 - Повністю згоден
Зміст був актуальним для моєї діяльності.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Навчання дало практичні, доцільні навички.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Структура навчання була чітка.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Темп навчання був належним.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8. Тренер / консультант(и) *

Mark only one oval per row.

	1 -Повністю не згоден	2 – не згоден	3 - Нейтрально	4 - Згоден	5 - Повністю згоден
Тренер продемонстрував знання теми.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Тренер ефективно доносив інформацію.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Тренер вичерпно відповідав на запитання	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Тренер добре розпоряджався часом.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Тренер був професійним та контактним.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Методика навчання була ефективною.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. Організація навчання *

Mark only one oval per row.

	1 -Повністю не згоден	2 – не згоден	3- Нейтрально	4- Згоден	5- Повністю згоден	6 - н/д
Місце проведення було прийнятним (якщо це можливо).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Харчування та проживання були належними (за наявності).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Навчальні матеріали були корисними.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Координатори навчання були чуйними.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. Вплив та пропозиції *

Mark only one oval per row.

	1 -Повністю не згоден	2 – не згоден	3 - Нейтрально	4 - Згоден	5 - Повністю згоден
Навчання дало навички, які безпосередньо стосуються моєї ролі.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Навчання підвищило мою впевненість у застосуванні нових технік.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Навчання було присвячене реальним викликам, з якими стикається наш водоканал.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Тренінг сприятиме покращенню наших комунальних послуг.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Навчальні матеріали/дані будуть корисними для подальшого використання	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

11. Чи вважаєте ви, що в майбутньому навчання повинно включати більше практичних вправ? *

Mark only one oval.

Так

Ні

12. Чи були б ви зацікавлені у подальшому навчанні на подібні теми? *

Mark only one oval.

Так

Ні

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