2023 CLA CASE COMPETITION

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**Case Title:**

A Data-Driven Project to Data-Driven Utilities

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**Summary:**

Jordan's traditional water sources are scarce and declining, and non-revenue water (NRW) levels are high. NRW is water lost through leaky pipes, theft, and metering errors. The major challenges to reducing NRW are a lack of good data, and long-standing water utility management practices. The USAID NRW Project focuses on leveraging measurements to decide on water loss reduction interventions. The data-driven approach to the developing and implementing of funding agreements with Jordan's water entities, which is based on learning from previous projects, enabled the collection of large amounts of accurate data on what works best to reduce water loss.

Following the success of the evidence-based approach to reducing water losses used in the NRW Project, USAID and the implementing partner were motivated to incorporate this approach into the core operations of water utility management. The strategic transition from a data-driven project to data-driven water utilities, which began through the implementation of various interventions under the NRW Project, aims to optimize water management, improve operational efficiency, and enable data-driven decision-making. This brought about advancements in systems and infrastructure, and also led to a remarkable shift in the culture within the water utility. The knowledge and experience gained throughout the life of the NRW Project greatly boosted the ability of the utilities' staff to effectively manage NRW reduction activities and interventions. Overall, the CLA approach used in the NRW Project can be seen as the first step in the transformation to smart utilities in Jordan.

1. **WHAT: What is the general context in which the case takes place? What organizational or development challenge(s) or opportunities prompted you to collaborate, learn, and/or adapt?**

Jordan is one of the most water scarce countries in the world. Its water challenges are characterized by intermittent supply and high levels of non-revenue water (NRW). NRW is the difference between the amount of water entering the water distribution system and the amount of water billed by the utility. In other words, it is water lost through leaky pipes, theft, and metering errors. For years, almost 50% of Jordan's water has been lost as NRW, undermining donor investment in expensive infrastructure. Climate change and population growth are exacerbating this already challenging situation.

While Jordan has long recognized these issues, a major challenge to reducing NRW in the country is the lack of good data to quantify NRW sources by location, identify NRW's root causes, and drive improvement. Another challenge is improving long-standing management practices, partly because utility management typically operates within a day-to-day crisis mode that neglects long-term problem solving.

The USAID Non-Revenue Water Project, which began in 2015, focused on leveraging measurements to make decisions on water loss reduction interventions, thereby avoiding the expensive construction approaches used in previous projects of a similar nature. The impact and cost of every improvement is measured and - where possible - further evaluated, with all adjustments made being based on results. This is done in collaboration with the water utility, USAID, and the Management Engineering Services Contract II (MESC II), the implementing partner which provides comprehensive technical assistance and facilitates institutional development to effectively execute the NRW project. This data-driven decision making approach has been used since the onset of the project, because, unlike typical engineering or construction projects, in which the scope of work is clear and predetermined, the NRW Project is ever evolving and adapts as data gradually presents the most effective investments and improvements.

2. **What two CLA Sub-Components are most clearly reflected in your case?**

Adaptive Management

M&E for Learning

3. **HOW: What steps did you take to apply CLA approaches to address the challenge or opportunity described above?**

The NRW Project methodology is centered on learning and adaptation via feedback loops. The technical team members are involved in MEL activities. Results from each are measured (primarily the amount of NRW reduction, but also other parameters) and used to modify the approach going forward. This approach mainly addresses the lack of reliable data on Jordan's water systems.

The first step to incorporating learning was the design of the NRW Project using the "fixed amount reimbursement agreement" (FARA) mechanism, whereby the water utility would pay for and implement agreed upon works, and be reimbursed only when MESC II certified tasks as completed. The NRW Project is divided into "Associate FARAs"–34 over three phases of the Project–which are drafted one at a time, taking previous results into account. This method was designed to be adaptable, as feedback on what works and what does not is taken into consideration. The repetition of tasks proven to have low effectiveness, or a high cost-benefit ratio, is avoided, and early results lead to better future outcomes by focusing on interventions shown to be successful in reducing water loss (CLA Sub-Component: M&E for Learning).

The next step was to establish a collaborative project management framework through weekly team meetings with all stakeholders (utility, implementing partner, and USAID). The meetings focus on joint brainstorming and problem-solving, as well as sharing progress on the ground. As the NRW Project progresses, data is generated and analyzed for feedback using granular NRW reduction data. Over time, a comprehensive database was developed to inform and refine future actions (CLA Sub-Component: Technical Evidence Base).

Moreover, USAID, MESC II, and the utility are all involved in the design of a new FARA. Stakeholders hold numerous meetings, each with a different purpose. Some take the form of pause and reflect sessions, while some focus on budgeting proposed interventions. Still others focus on fine-tuning the agreement based on expert recommendations and previous learning. All in all, it is a collaborative process that ensures all parties have a say in the planned water loss reduction interventions (CLA Sub-Component: External Collaboration).

This data-driven and evidence-based approach to water loss reduction used in the NRW Project motivated the USAID and MESC II teams to begin incorporating a similar approach into the core operations of water utility management, albeit on a larger scale.

USAID and MESC II took a step further by specifying a number of FARAs that aim to transform the water entities in Jordan into data-driven smart utilities capable of collecting and analyzing vast amounts of data that is sufficiently high-quality, so as to guide NRW reduction interventions.

The strategic transition from a data-driven project to data-driven water utilities began through the implementation of various projects under the NRW Project. The goal of this transition is to optimize water management, enhance operational efficiency, and enable data-driven development strategies.

Through the FARA mechanism, the USAID NRW Project began to implement a number of different interventions to facilitate this transition, including: establishing a nationwide supervisory control and data acquisition (SCADA) system; applying real-time monitoring of bulk water supply; implementing ERP and IT system upgrades; and establishing a smart operation platform by integrating advanced metering, data acquisition, and automation.

The transformation to data-driven water utilities not only marks a significant advancement in the sector, but also serves as a foundation for the next step in utility management: the realization of smart utilities. By harnessing the power of data, these smart utilities can unlock a multitude of benefits and revolutionize the way water resources are managed in Jordan.

## 4. RESULTS: Choose one of the following questions to answer.

*We know you may have answers in mind for both questions; However please choose one to highlight as part of this case story*

B. ORGANIZATIONAL EFFECTIVENESS

The CLA approach developed for the NRW Project has had a major impact on the way the water utility is managed. Previously, water systems were managed in a way that contributed to the increase of NRW levels. Thus, to ensure that NRW Project activities achieved their targets, and had sustainable results that extend beyond the lifetime of the project and evolve into standard practices within water utility management, a number of issues had to be addressed.

An important example of this impact can be seen in the water utility's NRW unit, and how its management has evolved. The lack of good data was a major challenge to address the NRW issue, and the NRW unit was operating somewhat autonomously. However, because the NRW Project is data-driven, it was essential that the NRW unit work collaboratively with all directorates within a water utility. Today, through the guidance and support of USAID and the implementing partner, all directorates within each water utility send their NRW-related data to the NRW unit. In turn, the NRW unit audits the data provided. This procedure ensures that NRW data are accurate and, most importantly, available in a timely manner so that NRW reduction interventions can be implemented and monitored accordingly.

The transition to data-driven water utilities not only brought about advancements in systems and infrastructure, but it also led to a remarkable shift in the culture within the water utilities. It has now become the practice to utilize data as part of the daily work of utility staff at all levels, making the transformation into smart utilities only a matter of time.

5. **ENABLING CONDITIONS: How have enabling conditions - resources (time/money/staff), organizational culture, or business/work processes - influenced your results? How would you advise others to navigate any challenges you may have faced?**

A major factor enabling the CLA approach was that the NRW Project was designed in a way that ensured learning and adapting, as seen in the FARA mechanism used to implement the Project. Breaking down the project into smaller Associate FARAs and only commissioning them sequentially over several years has allowed early results to inform later interventions.

Another important enabling factor was the strong relationship between the different stakeholders within the NRW Project. The USAID team working on the project, the MESC II team, and the managers and focal points at the Jordanian water utilities worked as one team towards a shared goal. The openness between the individuals responsible for delivering the project and the collaborative project management method in which all the stakeholders operated as equals removed the bureaucracy practiced in traditional projects and enabled a culture of problem solving and continuous improvement. The knowledge, experience, and institutional capacity gained throughout the NRW Project has boosted the utility staff ’ s ability to effectively manage NRW reduction activities and projects.

In terms of the utility ’ s capacity to finance future solutions, the NRW Project ’ s goal, besides conserving water, was also to reduce the utility ’ s expenses and increase revenues. Throughout the Project lifetime, the data-driven CLA approach has helped to identify the most cost-effective interventions to reduce NRW, which ultimately led to more cost-effective and robust utility management.