

Review of: "Reducing non-revenue water in Egypt using GIS"

Loic Queval¹

¹ University of Paris-Saclay

Potential competing interests: No potential competing interests to declare.

Dear author,

I have carefully reviewed the manuscript, titled "Reducing non-revenue water in Egypt using GIS, preprint v1," submitted by Z. Yehia to Qeios (Qeios ID: X8Q5CK, <https://doi.org/10.32388/X8Q5CK>).

The author discusses a methodology for utilities to reduce unaccounted-for water. It includes: a 1st step of off-site/on-site GIS mapping, a 2nd step of on-site work to fix physical losses, and a 3rd step of on-site work to fix non-physical losses.

Overall, I find the work to be insightful and potentially valuable for the readership. I have identified several areas that, if addressed, could enhance the clarity and impact of the paper.

Methodology Clarity and Readability

The methodology for reducing unaccounted-for water (UFW) is a crucial aspect of your work. To improve readability and usefulness, consider explicitly numbering, improving labeling, and completely detailing the methodology steps. Explain clearly why GIS is central to this methodology, as it's unclear in the present draft. The case study in Luxor can be used as an illustrative example to enhance the reader's understanding of the methodology and its practical application.

Section 2

- Could you add a reference for the statement regarding UFW exceeding 40%? This is essential to strengthen the credibility of the information.
- Clarify if Section 2.2 outlines the methodology proposed by the author or merely the steps followed during the study. Specify the relevance of each step to the reader and distinguish between off-site and on-site activities.
- Explain the meaning of the arrows in Fig. 1 to aid in the reader's comprehension.
- Address the connection between the images in Figs. 1, 2, and 3. Is the satellite image of Fig. 2 part of Fig. 1? Why is the same area not consistently depicted?

Section 3

- Elaborate on the relevance of the list at the beginning of Section 3 in relation to the methodology. Provide more detailed information about each item if they are indeed part of the methodology.
- Provide the exact reference (manufacturer and part number) for the installation of three ultrasonic flow meters.

- Support the claim regarding the replacement of the network if the cost of leak fixing exceeds 50% of the replacement cost with a reference.
- The reader recognizes a decline in water consumption between before and after addressing leaks. However, the reported figure of 32.2% poses challenges in its scientific interpretation. Drawing a definitive conclusion attributing the reduction solely to leak repairs is complicated, as external factors such as the day of the week, weather conditions, or significant usage fluctuations could have influenced the observed changes. Consequently, these additional variables diminish the persuasiveness of the presented results.
- Clarify the calculation of UFW in Table 1, as the presented formula seems inconsistent with the definition of UFW.
- The assertion is made that the total number of malfunctioning meters is 508, comprising both out-of-order and less accurate reading meters (287 + 230). However, an arithmetic inconsistency arises as the sum of 287 and 230 equals 517.
- A comparison is presented regarding the consumption of the 1727 customers within the pilot area during the November and December periods of 2008 and the corresponding months in 2009. This comparative analysis renders the figures in this section valuable to the reader. To enhance clarity, consider adding a label to the relevant table or alternatively, removing Table 3, which appears similar to the unlabeled table, to avoid redundancy.

Section 5

Kindly consider transforming the content of this section into complete sentences rather than presenting it as a bullet point list. Additionally, provide detailed information on the ease or difficulty of implementing each measure and expound on the anticipated effects to enhance the comprehensiveness and engagement of this section.

Minor Comments

- Avoid abbreviations in the abstract: UFW. Make sure all the abbreviations are defined in the text: OJT, GIS, etc.
- Be consistent with terms in the abstract and body: Unaccounted for Water vs. unaccounted-for water
- Double check English (meaning of “rural governorates” for example)
- Improve formatting (for example, list in section 2.3)
- Consider avoiding using percentages related to the reduction and increase of UFW alongside UFW (which is a percentage too). This mixing of different percentage metrics can create confusion for the reader. Ultimately, the reader's primary interest lies in UFW alone.

Taking into consideration these aspects will undoubtedly enhance the overall quality and impact of the manuscript. I appreciate the dedication invested in this research and eagerly anticipate delving into more details about your future endeavors.

Best regards,

Prof. L. Quéval

CentraleSupélec, Univ. Paris-Saclay, France

