Qeios

Peer Review

Review of: "Phosphorus Recovery Potential from Decentralised Wastewater Treatment Systems in India: A Constrained Mass-Balance Study of Auroville"

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Your work on the DEWATS is outstanding, and there are some minor suggestions to improve the research paper.

1. The introduction lacks citations and would benefit from opening with global phosphorus recovery benchmarks from DEWATS systems (e.g., recovery efficiencies of 10–50% post-sludge treatment worldwide), followed by the estimated potential of 3.7 million tonnes of P annually from wastewater —equivalent to ~20% of global fertilizer demand—before addressing local challenges such as soak pit failures in hard rock areas.
2. A brief synthesis of existing research on phosphorus recovery from DEWATS would strengthen the rationale, clearly identify knowledge gaps (e.g., implementation barriers in the Indian context), and justify the novelty of this study.
3. Consider adding 1–2 sentences clarifying the sampling frame and data collection methodology to enhance methodological transparency and reproducibility.
4. Section 2.1 could be streamlined with a workflow diagram to clearly illustrate the study design, improving readability and logical flow.
5. In section 2.6.2, please include the specific formula or reference used for sensitivity analysis to enable verification of the computational approach.
6. The techno-economic feasibility assessment (TEFA) would benefit from explicit formulas, such as:

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$$NPV = \sum[(Benefits_t - OPEX_t) / (1 + r)^t] - CAPEX$$

$$BCR = PV(Benefits) / PV(CAPEX + OPEX); BCR > 1 \text{ indicates feasibility}$$

where r = discount rate (typically 5–10%) and t = time period in years. Additionally, including a dedicated 'Limitations' subsection would strengthen the discussion by addressing potential constraints such as site-specific variability, data uncertainties, or scalability challenges."

Declarations

Potential competing interests: No potential competing interests to declare.