

# Review of: "Socioeconomic Impacts of Hybrid Pico Hydro-Solar Generation System Implementation in Sitio Singawan, Barangay Umiray, Municipality of Dingalan, Aurora, Philippines"

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Potential competing interests: No potential competing interests to declare.

## Review comments

The manuscript comes in handy and is valuable to literature in the area. A few areas need modifications to add up to the manuscript's impact on the subject area.

## Abstract

1. **Clarity of Objectives:** The abstract outlines the project's focus on the socioeconomic impacts of the Hybrid Pico Hydro-Solar Generation System in Sitio Singawan. However, it would be beneficial to explicitly state the specific socioeconomic indicators being assessed to enhance clarity and provide a clear direction for the reader.
2. **Methodology Description:** Please, the abstract mentions the methodology, but it lacks details on the benchmark surveys and needs assessments. Provide concise information on the survey tools used, the sampling strategy, and the criteria for needs assessment. A brief mention of the ethical considerations, if any, would also be valuable.

## Social impact

1. **Quantifiable Metrics:** please, while the narrative on improved lighting conditions is compelling, consider incorporating specific metrics or examples to quantify the impact. This will add precision to the claims made regarding increased productivity and extended study hours.
2. **Appliance Utilization:** Elaborate on the frequency and duration of appliance usage. Providing specific instances or data on the usage patterns of appliances such as televisions and radios will strengthen the paper's empirical foundation.
3. **Safety and Security Claims:** While the claim that improved lighting has enhanced safety is plausible, consider providing statistics or community testimonials to substantiate this statement. This will bolster the credibility of the paper's assertions on the reduction of accidents and criminal activities.
4. **Community-wide Impact:** please, to reinforce the paper's broader impact, delve deeper into the effects on public spaces like schools and healthcare facilities. Include specific examples or cases where reliable electricity has led to tangible improvements in education and healthcare services.
5. **Economic Opportunities:** it would be very helpful if the authors consider to expand on the nature of small-scale

enterprises and entrepreneurial ventures that have emerged. Provide concrete examples of businesses that have benefited from the Hybrid Pico Hydro-Solar Generation System, and consider discussing any challenges faced by these ventures.

6. **Poverty Reduction Metrics:** please, the statement on economic empowerment contributing to poverty reduction is crucial. Include relevant metrics or indicators that demonstrate how the newfound energy has led to tangible improvements in income levels and livelihoods within the community.
7. **Long-term Sustainability:** Discuss the sustainability of the observed impacts over time. Consider potential challenges to the continued success of the Hybrid Pico Hydro-Solar Generation System in sustaining the outlined benefits.
8. **Comparative Analysis:** please, if available, consider comparing the socioeconomic impacts observed in Sitio Singawan with similar interventions in other regions. This would provide context and contribute to the broader understanding of the Hybrid Pico Hydro-Solar Generation System's effectiveness.
9. **Conclusion Linkage:** In the conclusion, tie back the socioeconomic impacts discussed in this section to the overall objectives of the study. Emphasize how these impacts align with the study's goals and contribute to the broader discourse on renewable energy systems in rural areas.

## Methodology

1. **Survey Methodology Clarity:** it will be very helpful if authors consider specifying the timeframe of the benchmark and needs assessment survey. This will provide context for the data collected and enhance the transparency of the study.
2. **Data Sources and Reliability:** Elaborate on the reliability and representativeness of geophysical data and census information obtained from the Municipal Comprehensive Land Use Plan and CBMS Census. Ensure clarity on how these sources align with the specific needs of the study.
3. **Pico Hydro System Rationale:** please, clarify the decision-making process behind choosing the Banki-Crossflow turbine over the initially selected Pelton turbine. Provide a brief rationale for this change and reference relevant literature or engineering considerations that influenced the decision.
4. **Site Selection Criteria:** Explicitly state the criteria and considerations for selecting the optimal location for the Pico Hydro Generation System. Mention if environmental impact assessments were conducted and how the chosen location aligns with sustainability goals.
5. **Control Algorithm Rationale:** Justify the selection of ANFIS as the control algorithm for the AGC. Reference relevant literature or studies supporting its reliability, speed, and efficiency in the context of pico-hydro power systems.
6. **Solar Generation System Integration:** Clarify how the Solar Generation Systems are integrated with the Pico Hydro Generation System. Provide insights into any hybrid functionality and how the two systems complement each other in addressing electricity requirements.
7. **Technology Transfer and Adoption:** please, it would be very helpful if the authors consider to provide more information on the outcomes of community engagements, workshops, and training sessions. Discuss any challenges faced during the transfer process and how they were addressed. Include feedback from community members to gauge the effectiveness of the educational initiatives.

## Results and Implications

1. **Clarity on Total Expenses:** please, it will be helpful if the authors consider clarifying the breakdown of the Php 135,000.00 allocated to construction materials, maintenance, and miscellaneous expenses. Providing a more detailed breakdown would enhance transparency and allow readers to understand how these expenses contribute to the overall project.
2. **ROI Calculation Transparency:** please, while the ROI calculation is presented, it would be helpful to include a brief discussion on the interpretation of the calculated ROI. Provide context on what the 20.49% ROI signifies and how it compares to benchmarks or industry standards for similar projects.
3. **Challenges in Power Distribution and System Maintenance:** please, it will be helpful if the authors consider to Elaborate on the specific challenges encountered in power distribution and system maintenance. This will provide a more nuanced understanding of the obstacles faced during the project and contribute to the practical insights for future initiatives.
4. **Impacts and Implications:** please, while the table summarizes positive changes brought about by the Hybrid Pico Hydro Solar Generation System, consider incorporating brief textual discussions for each impact and implication. This will provide a more comprehensive understanding of the interconnected aspects of the project's outcomes.
5. **Environmental Benefits Clarification:** Clarify the specific environmental benefits of the Pico Hydro Generation System. Provide data or references supporting the claim that the system reduces greenhouse gas emissions and minimizes ecological footprints compared to other energy sources.
6. **Community Involvement and Ownership:** Highlight specific outcomes of community involvement, especially from the established local committee overseeing system maintenance. Discuss how this community-driven approach ensures sustainability and empowers the residents.
7. **Conclusion Linkage:** Strengthen the conclusion by explicitly connecting the economic analysis results with the broader understanding of the social impact and economic viability of rural electrification initiatives. This will reinforce the significance of the findings in the context of the study's objectives.
8. **Reference Citations:** Ensure that all the data presented that are not the original work of the authors, especially if any of the following existed, figures and economic calculations, are properly referenced. This will enhance the paper's credibility and allow readers to trace the sources of the information presented.
9. **Generalization of Findings:** Discuss the potential applicability of the study's findings to other rural electrification initiatives. Address any limitations that may affect the generalizability of the results to ensure a realistic interpretation of the impact.

## Conclusion

1. **Future Guidance Clarity:** Specify the exact guidance that the insights from this study offer for future initiatives. Provide concise recommendations or lessons learned that can be directly applied by policymakers, researchers, or practitioners in the field of rural electrification.
2. **Acknowledgment of Limitations:** Include a brief acknowledgement of any limitations or challenges faced during the research and implementation. This demonstrates transparency and allows readers to contextualize the findings

appropriately.

3. Forward-Looking Statement: Conclude with a forward-looking statement, briefly discussing the potential for scalability or replication of the model in other similar contexts. This adds a dimension of practicality and applicability, enhancing the paper's impact.

Addressing these points will contribute to the paper's coherence, transparency, and impact, making it suitable for the journal's publication.