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REVIEWER'S REPORT

Manuscript No.: IJAR-59071

Title: SOURCES D'ÉNERGIE RENOUVELABLES (ÉNERGIE SOLAIRE) 2 POUR L'AGRICULTURE ET LES SYSTÈMES DE STOCKAGE DES ALIMENTS.

Recommendation:

Accept as it is .....

Accept after **minor revision.....**

Accept after major revision .....

Do not accept (*Reasons below*) .....

Rating	Excel.	Good	Fair	Poor
Originality		Good		
Techn. Quality		Good		
Clarity		Good		
Significance		Good		

Reviewer's ID: JPR- **115 Dr Thirunahari Ugandhar**

Detailed Reviewer's Report

The manuscript addresses an important and timely topic concerning the role of renewable energy, particularly solar energy, in agriculture and food-storage systems. The subject is highly relevant to sustainable agriculture, food security, climate-change mitigation, and rural development. The manuscript provides a useful overview of renewable-energy applications across the agri-food value chain. However, substantial revisions are required to improve its scientific rigor, organization, originality, and presentation.

Major Comments:

1. **Abstract:**

   The abstract provides useful background information but should be reorganized into a structured format covering **Background, Objective, Methodology, Major Findings, and Conclusion**. The statement that approximately 30% of global energy is consumed by the agri-food system should be supported by an appropriate and recent authoritative reference.

2. **Scientific accuracy**

   The statement that energy is responsible for "one-third of emissions of substances harmful to the ozone layer" appears scientifically inaccurate or misleading. The authors should distinguish between **greenhouse-gas emissions** and **ozone-depleting substances** and revise this statement accordingly.

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3. **Systematic review methodology:**

The manuscript states that a systematic literature review was conducted, but the methodology is insufficiently described. The authors should provide:

Databases searched (e.g., Scopus, Web of Science, PubMed, ScienceDirect, Google Scholar);

Search terms and Boolean operators;

Publication period;

Inclusion and exclusion criteria;

Screening and selection procedures;

Number of articles initially identified and finally included;

Method used for quality assessment of selected studies.

A **PRISMA flow diagram** would substantially improve the methodological quality of the review.

4. **Literature coverage:**

The references cited appear relatively limited in several sections. The authors should incorporate more recent studies, preferably from **2020–2026**, addressing solar-powered irrigation, solar cold storage, photovoltaic systems, solar drying, energy-efficient food processing, battery storage, and decentralized renewable-energy systems.

5. **Solar-energy applications:**

The review would be strengthened by presenting specific applications separately, such as:

Solar-powered irrigation and water pumping;

Solar dryers;

Solar-powered cold storage;

Solar refrigeration;

Solar-powered food processing;

Photovoltaic systems for agricultural operations;

Solar greenhouse technologies;

Solar energy combined with battery storage.

6. **Energy-storage systems:**

Since energy storage is an important component of the manuscript, the authors should provide a dedicated section comparing **lithium-ion, lead-acid, flow batteries, thermal energy storage, and other emerging storage technologies**. Their advantages, limitations, costs, lifespan, environmental impacts, and suitability for rural agriculture should be discussed.

7. **Quantitative analysis:**

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The manuscript would benefit from quantitative information wherever available. For example, the authors could compare renewable-energy systems with conventional diesel generators in terms of **energy consumption, operating costs, carbon emissions, payback period, and reduction in post-harvest losses**.

8. **Food-loss reduction:**

   The relationship between renewable energy and post-harvest food losses deserves greater attention. The authors should provide evidence demonstrating how solar-powered refrigeration, drying, and storage can reduce losses in fruits, vegetables, dairy products, fish, meat, and other perishable commodities.

9. **Regional perspective**The discussion would be more valuable if it included examples from **Africa, South Asia, India, and other developing regions**, particularly rural and off-grid agricultural communities.

10. **Economic feasibility:**

    Initial investment costs are mentioned, but the economic aspects are not sufficiently analyzed. The authors should discuss **capital costs, operation and maintenance costs, financing mechanisms, subsidies, payback periods, and levelized cost of energy (LCOE)** where appropriate.

11. **Environmental sustainability:**

    The review should consider the complete environmental implications of solar technologies, including **manufacturing impacts, battery disposal, recycling, land requirements, water use, and end-of-life management**.

12. **Tables and figures:**

    The manuscript would benefit considerably from summary tables and conceptual figures. For example, a table could compare different renewable-energy technologies according to **application, energy source, advantages, limitations, storage requirement, and agricultural suitability**. A conceptual diagram showing the integration of solar energy, agriculture, food processing, cold storage, and battery systems would also improve readability.

13. **Discussion:**

    The discussion largely repeats the findings and should provide more critical synthesis. The authors should compare findings from different studies, identify contradictions or knowledge gaps, and explain the conditions under which solar-energy systems are most effective.

14. **Future perspectives:**

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A dedicated section on future research should be included. Topics such as **AI-based energy management, smart irrigation, IoT-enabled cold storage, hybrid solar-battery systems, agrivoltaics, smart microgrids, and renewable-energy forecasting** could be considered.

15. **References:**

The references should be carefully checked for completeness, consistency, and accuracy. The authors should use recent peer-reviewed literature and authoritative sources such as **FAO, IRENA, IPCC, World Bank, and IEA**, wherever relevant. All in-text citations should correspond exactly to entries in the reference list.

16. **Language and presentation:**

The manuscript requires substantial English/French language editing. Several sentences are awkward or appear to be direct translations. Grammar, terminology, punctuation, and sentence construction should be carefully revised by a fluent scientific-language editor.

Minor Comments

1. Correct typographical and formatting problems in the title and throughout the manuscript.
2. Ensure consistent terminology for **renewable energy, solar energy, agro-food/agri-food systems, food storage, and energy storage**.
3. Avoid repetition of statements concerning the importance of renewable energy.
4. Define abbreviations at their first occurrence.
5. Ensure that all numerical claims are supported by appropriate references.
6. The numbering of sections and lines should be checked carefully.
7. The conclusion should emphasise the **key findings and specific implications** rather than largely repeating the introduction.
8. Keywords should be optimized and should include terms such as **solar energy, renewable energy, agricultural systems, food storage, cold chain, energy storage, and food security**.

Recommendation: Minor Revision