

Review of: "Water-Energy Nexus in Power Systems: A Review"

Jean Albergel¹

¹ Institute of Research for Development

Potential competing interests: No potential competing interests to declare.

The provided paper offers a comprehensive overview of the intricate relationship between water and energy resources, focusing on their interdependence and the challenges posed by climate change. It highlights the crucial need for integrated approaches in managing the water-energy nexus for sustainable development.

The paper adeptly examines various facets of this nexus, emphasizing the significant reliance of energy production on water and vice versa. It discusses how climatic changes impact water availability, consequently affecting energy production and consumption. Moreover, it stresses the importance of interdisciplinary strategies to manage this nexus effectively, especially amidst climate variability.

Furthermore, it outlines the literature review's structure, providing a clear framework that delves into various aspects, such as the role of ICTs, social and environmental considerations, modeling techniques, and government policies. This organized structure promises a thorough exploration of the water-energy nexus, guiding readers through diverse research aspects and concluding with critical areas necessitating further exploration.

Overall, the paper is informative, well-structured, and effectively highlights the significance of comprehending and managing the water-energy nexus for sustainable development and climate resilience.

However, for an enhanced review, considerations could include:

- Consolidating complex technical terms or concepts for readers less familiar with the field.
- A brief comparative analysis of the strengths and limitations of each methodology might add further depth.
- Exploring potential future developments or emerging trends in these methodologies to provide a more forward-looking perspective.

Overall, the review effectively presents a comprehensive overview of methodologies used in investigating the water-energy nexus, providing substantial insights and real-world applications, thus catering to a wide audience interested in sustainable resource management. We would have liked to see a few case studies from the least developed countries, particularly in Africa.

The detailed review of policies related to the water-energy nexus provides a comprehensive analysis of international, national, and local efforts aimed at addressing the intertwined challenges of water and energy resource management. It effectively outlines the global perspective, citing the United Nations' Sustainable Development Goals (SDGs) and

emphasizing the significance of integrated approaches for sustainable water and energy management.

The review effectively concludes by identifying key challenges associated with managing the water-energy nexus, such as complex synergies, urban-specific issues, and the necessity for improved system efficiency. The introduction of the concept of the Water-Energy-X (WEX) nexus, encompassing water, energy, carbon, food, and health, presents a forward-looking perspective on holistic resource management.

However, to enhance the review, providing examples of successful policy implementations and their measurable impacts could strengthen the analysis. Additionally, exploring potential areas for policy improvement or innovation and addressing barriers to effective policy implementation could offer valuable insights for policymakers and researchers.

Overall, the review presents a detailed and comprehensive overview of policies at various levels addressing the water-energy nexus, emphasizing the global significance of integrated resource management strategies and highlighting key challenges that need to be addressed for a sustainable future.