

Leveraging Blockchain Technology to Augment Food Waste Reduction in Food Supply Chain: A systematic Review

Denis M. Silayo, Abiud J. Bongole, Mary Kulwijila

<https://doi.org/10.1080/23311932.2025.2546079>

Background

- * 19% of food intended for human consumption is wasted globally (UNEP, 2024).
- * 14% of produced food is lost (FAO, 2019).
- * Threatens food security, sustainability, and economic stability.
- * Traditional supply chains lack traceability and accountability.
- * Blockchain Technology (BT) offers transparency, immutability,

Objectives

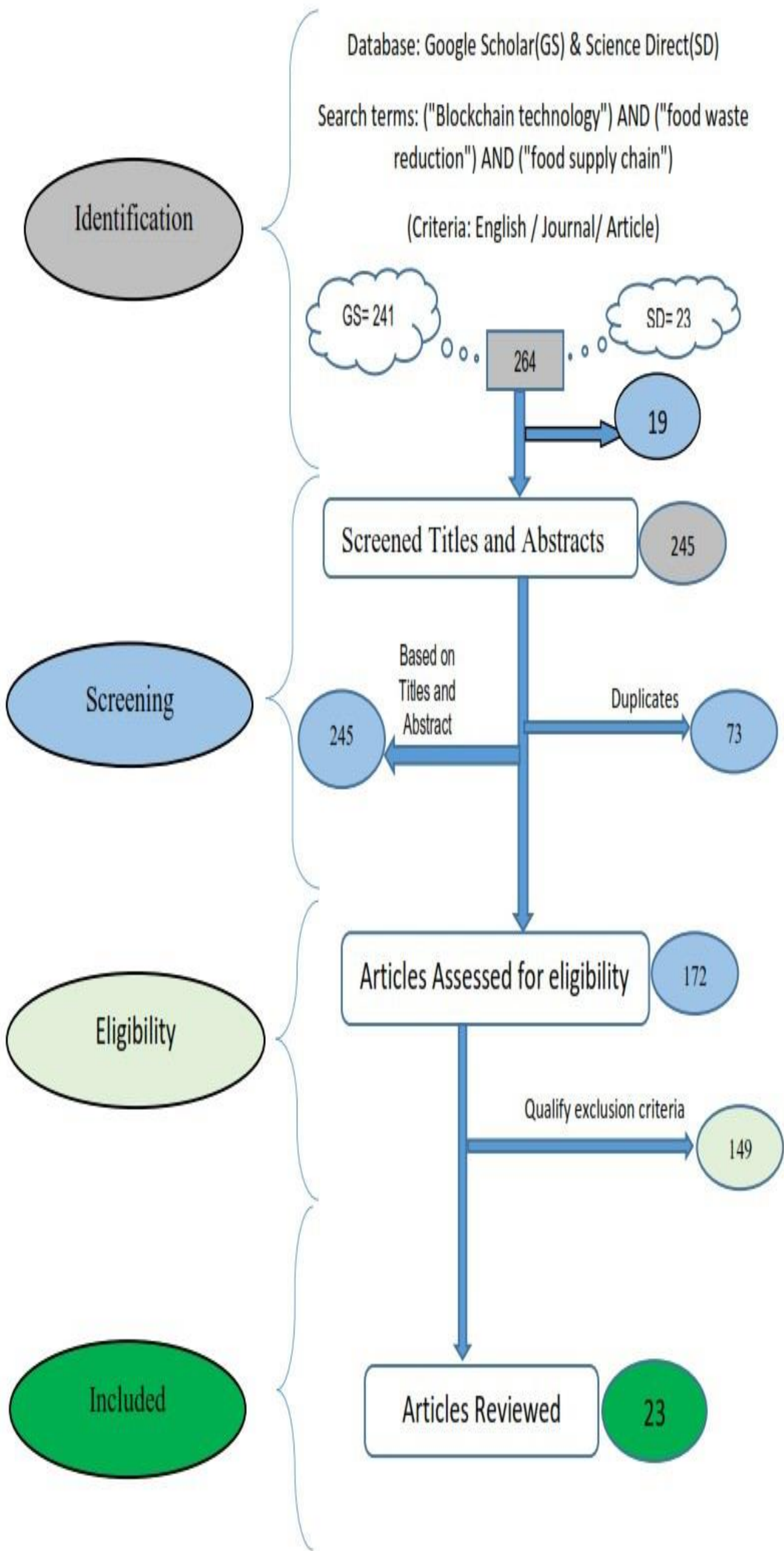
- * Review how BT contributes to food waste reduction.
- * Identify benefits, challenges, and research gaps

Benefits:

- * Traceability (production -> consumption)
- * Improved accountability & trust.
- * Reduced inefficiencies (i.e. spoilage)
- * Supports circular economy initiatives.
- * Integration with IoT enhances monitoring.

Challenges:

- * High costs of implementation.
- * Low digital literacy.
- * Weak infrastructure in LDC's.
- * Data governance and regulatory barriers.
- * Diverse actors complicate standardization.



PRISMA Flow Diagram

Reference

Conclusion

- * BT shows strong potential to reduce food waste.
- * Requires collaboration, policy support, and infrastructure.
- * More research needed at household level & in Africa.
- * Adoption of BT = step toward sustainable food systems.

