

# Review of: "Revitalizing Key Conditions and Integrated Watershed Management Approach to Sustain Water Availability and Agriculture in Semi-Arid Regions"

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Potential competing interests: No potential competing interests to declare.

The provided text discusses the integrated watershed management (IWSM) approach and highlights various constraints that impede its successful implementation. The key conditions for revitalizing the approach include assuring institutional, legal, and policy support, practicing proper soil and water resource management, securing access to integrated agricultural inputs, and establishing scientific and technology support in a watershed. While the text provides a comprehensive overview of the challenges and proposed solutions, there are some issues that need attention for a more effective interpretation of the results and implementation of the IWSM approach.

-The paper is quite dense, and the language used is complex. Consider simplifying some sentences for better readability. Consider breaking down lengthy paragraphs into smaller ones for better readability.

-Ensure consistency in terminology. For example, "water availability" is sometimes referred to as "water productivity," and clarification might be needed.

-The text emphasizes institutional, policy, and socio-economic constraints but provides limited insight into specific technical challenges related to the implementation of soil and water conservation measures, water harvesting techniques, and sustainable agricultural practices. A more detailed discussion on the technical aspects, such as the selection of appropriate SWC measures, soil reconditioning strategies, and efficient water management practices, would enhance the understanding of the practical issues faced in the field.

-The text briefly mentions the importance of community participation but does not delve deeply into the challenges and benefits of engaging local communities and stakeholders. Understanding the dynamics of community involvement, addressing cultural considerations, and fostering participatory approaches are critical components that deserve more attention.

-Given the potential impact of climate change on semi-arid regions, the text could benefit from a more explicit discussion on how climate variability and change might affect the success of the IWSM approach. Integrating climate-smart strategies and adaptive measures into the proposed key conditions would enhance the approach's resilience to future challenges.

-The text lacks a clear discussion on the establishment of a robust monitoring and evaluation framework to assess the

effectiveness of the IWSM approach over time. Including metrics for success, periodic assessments, and adaptive management strategies would contribute to continuous improvement and learning.

-While the text provides insights into the challenges faced in specific regions, it could benefit from discussing the global relevance and applicability of the proposed key conditions. Recognizing the diversity of semi-arid regions and tailoring the approach to different contexts would enhance its scalability and effectiveness.

-The paper could benefit from a more explicit roadmap or structure at the beginning to guide the reader through the content.

-The abstract is concise, but it could be more explicit about the specific findings or contributions of the paper.

-In Section 2: Revitalizing the Integrated Watershed Management Approach: The list of problems is comprehensive. It might help to highlight which constraints are more prevalent or critical in semi-arid regions to guide future research or interventions.

-In Subsection 3.1: Assuring institutional, legal, and policy support: Consider providing specific examples or case studies where institutional support has made a difference.

-Subsection 3.2: Assuring proper soil and water resource management in a watershed: The discussion is thorough. However, it might be beneficial to include some real-world examples or case studies to illustrate successful implementation.

-Subsection 3.3: Assuring proper integration of agricultural inputs: Provide examples of successful integration of agricultural inputs in semi-arid regions.

-Subsection 3.4: Establishment of a watershed-based scientific and technology platform: Expand on the challenges and opportunities in implementing such a platform.

-Consider adding figures, tables, or graphs to illustrate key points and data, enhancing the visual appeal of the paper.

-Emphasize the global relevance of the findings and recommendations. How can these insights be applied across different regions?

-The manuscript could be substantially improved by relying and citing more on recent literature in the field sustainability and IWSM.

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