



Use Of Digital Knowledge Sharing Platform Like Wikis On Sharing Of Water-Efficient Techniques And Methods For Minimizing Water Scarcity

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Abstract: Water scarcity is one of the major environmental challenges affecting communities, agriculture, industries, and sustainable development. The effective sharing of knowledge about water-efficient techniques and conservation methods can play an important role in reducing water wastage and promoting sustainable water management. This research focuses on the use of digital knowledge-sharing platforms, particularly Wiki-based platforms, for collecting, organizing, sharing, and accessing information related to water-efficient techniques and methods for minimizing water scarcity. The study aims to examine how a collaborative digital platform can enable users, researchers, farmers, water-management organizations, and communities to contribute and access practical knowledge about water conservation, efficient irrigation, rainwater harvesting, wastewater reuse, and other water-saving practices. The proposed approach involves designing a structured knowledge-sharing platform where information can be collaboratively created, updated, categorized, and accessed by users. The platform can improve the availability and accessibility of reliable information while encouraging knowledge exchange and community participation. The study highlights that digital knowledge-sharing platforms can support awareness, collaboration, and the adoption of water-efficient practices. The proposed Wiki-based approach can therefore serve as a useful digital resource for sharing knowledge and supporting sustainable water management and efforts to minimize water scarcity.

Keywords: Water Scarcity, Water Conservation, Digital Knowledge Sharing, Wikis, Water-Efficient Techniques, Knowledge Management

I.INTRODUCTION

Water is one of the most essential natural resources required for human life, agriculture, industries, and ecosystem sustainability. However, water scarcity has become a growing global challenge due to population growth, rapid urbanization, climate change, irregular rainfall, groundwater depletion, and inefficient use of available water resources. The increasing demand for water makes it necessary to promote effective water conservation and water-efficient practices. Several techniques are available to improve water-use efficiency, including rainwater harvesting, drip irrigation, sprinkler irrigation, water reuse, groundwater conservation, and household water-saving practices. However, information about these techniques is often distributed across government reports, research papers, websites, and institutional resources. The scattered nature of this information can make it difficult for users to find organized and easily understandable knowledge. Digital knowledge-sharing platforms provide an opportunity to collect, organize, and disseminate information in a centralized manner. A Wiki-based platform can allow users to search, browse, create, edit, and update articles related to water-efficient techniques while maintaining references to reliable sources. Such a platform can support collaborative knowledge sharing and make relevant information more accessible to different users. This research focuses on the use of a Wiki-based digital knowledge-sharing approach for sharing water-efficient techniques and methods for minimizing water scarcity. The study examines existing information sources, identifies major categories of water-efficient techniques, and proposes a structured platform for organizing and sharing this knowledge. The proposed approach aims to improve access to water management information and support awareness of sustainable water use practices.

The remainder of this paper discusses the existing literature, research methodology, proposed platform structure, findings, discussion, limitations, and future research directions.

**II.LITERATURE SURVEY/LITERATURE REVIEW**

2.1 Existing Studies: Water scarcity and inefficient water use have been widely studied from environmental, agricultural, technological, governance, and knowledge-management perspectives. Existing studies provide important information about water conservation, efficient water use, sustainable irrigation

UNESCO (2024), through the United Nations World Water Development Report 2024: emphasizes water security, equitable access to water, cooperation, science, technology, information, and capacity development. The report highlights the importance of effective water management for social, economic, and environmental sustainability. However, it does not specifically propose a Wiki-based platform for sharing water-efficient practices.

FAO (2020), in The State of Food and Agriculture 2020: Overcoming Water Challenges in Agriculture, discusses increasing water constraints and emphasizes sustainable and equitable water use, water conservation, water harvesting, and improved water-management practices. The study demonstrates the importance of making practical water-management knowledge accessible to users.

The National Water Mission (NWM), Government of India, focuses on water conservation, minimizing water wastage, citizen participation, and improving water-use efficiency. It also promotes practices such as micro-irrigation, recycling, and improved water-management methods. These objectives are relevant to the proposed digital knowledge-sharing approach

Cress and Kimmerle (2008) examined collaborative knowledge building with Wikis and explained how Wiki environments can support collaborative knowledge creation. This is relevant to the proposed platform because users can contribute, update, and improve information about water conservation practices.

Karipidis and Tsimperidis (2024) reviewed 110 empirical studies on the use of Wikis in education. Their study demonstrates the potential of Wikis as collaborative and learning tools while also identifying technical and implementation-related challenges.

Huang (2019) investigated cooperative Wiki-supported learning activities and user participation. The study indicates that proper structure, guidance, and support are important for effective collaborative Wiki activities. This suggests that a water-focused Wiki should provide organized content and appropriate guidance.

2.2 Research Gap

The existing literature covers two major areas. The first area focuses on water scarcity, water conservation, efficient irrigation, water governance, and sustainable water management. The second area focuses on Wikis as collaborative tools for knowledge creation and information sharing. However, comparatively less attention has been given to combining these two areas into a dedicated Wiki-based digital knowledge-sharing platform for water-efficient techniques. Existing water-related information is distributed across different reports, websites, research papers, and institutional resources. Therefore, there is a need for a centralized platform that can collect, organize, update, and disseminate practical information about water-efficient techniques. The present research addresses this gap by proposing a structured Wiki-based platform that connects water-conservation knowledge with users through an accessible and collaborative digital environment.

2.3 Synthesis of Literature

The reviewed literature indicates that effective water management requires not only technological and conservation measures but also reliable information, awareness, knowledge sharing, and appropriate management practices. UNESCO, FAO, and the National Water Mission provide important information about water security, conservation, and water-use efficiency. Meanwhile, research by Cress and Kimmerle, Karipidis and Tsimperidis, and Huang demonstrates the potential of Wiki environments for collaborative knowledge creation and sharing.

Based on these findings, the present research combines water-management knowledge with Wiki-based collaborative knowledge sharing. The proposed platform aims to organize information about water-efficient techniques in a centralized and searchable format, thereby supporting the dissemination of knowledge related to sustainable water management and minimizing water scarcity

III METHODOLOGY**3.1 Research Design**

This study follows a **descriptive and design-oriented research approach** to examine the role of a Wiki-based digital knowledge-sharing platform in sharing water-efficient techniques and methods for minimizing water scarcity.

The descriptive component focuses on understanding water scarcity, water-use efficiency, conservation practices, and the information requirements of potential users. The design-oriented component focuses on developing a conceptual structure for a Wiki-based platform through which water-related knowledge can be collected, categorized, updated, and shared.

3.2 Data Collection Methods:

The study primarily uses **secondary data** collected from reliable and publicly available sources. These include government reports, international organization reports, research papers, journal articles, books, and official websites related to water conservation, water-use efficiency, sustainable water management, and digital knowledge sharing. Important sources include **FAO, UNESCO, World Bank, and the National Water Mission, Government of India**. Information related to rainwater harvesting, micro-irrigation, wastewater reuse, groundwater conservation, and household water efficiency is collected and organized from these sources.

3.3 Research Tools and Techniques

The major research techniques used in the study are:

- i. **Literature Review:** To examine existing studies and identify the research gap.
- ii. **Document Analysis:** To analyze reports, research papers, and institutional publications.
- iii. **Content Categorization:** To classify water-related information into suitable categories.
- iv. **Comparative Analysis:** To compare information obtained from different sources.
- v. **Digital Platform Design:** To develop the conceptual structure of the proposed Wiki-based Platform

RESEARCH METHODOLOGY FLOWCHART



Figure 1. Research Methodology Flowchart

3.4 Categorization of Water-Efficient Techniques:

The collected information is organized into major water-efficiency categories, including:

1. Rainwater Management
2. Agricultural Water Efficiency
3. Water Reuse
4. Groundwater Conservation

5. Household Water Efficiency
6. Community Conservation
7. Sustainable Water Management

This categorization helps organize the information so that users can easily search and access relevant water-efficient practices.

3.5 Proposed Wiki-Based Platform Design:

Based on the literature and collected information, a conceptual Wiki-based platform structure is proposed. The platform is designed to allow users to **search, browse, create, edit, categorize, and update** knowledge of articles related to water-efficient techniques. Each knowledge article may contain the technique of name, description, procedure, benefits, application area, precautions, and references. The platform can also include source verification, multimedia content, user contribution, content moderation, and mobile-friendly access

IV. RESULTS

4.1 Identified Water-Efficient Techniques:

The study identified several important categories of water-efficient techniques from the reviewed literature and secondary sources. These techniques are organized to make water management knowledge easier to access and understand. Table 1. Major Water-Efficient Techniques Identified

Category	Example Information
Rainwater Management	Rainwater harvesting, rooftop harvesting
Agricultural Water Efficiency	Drip irrigation, sprinkler irrigation, micro-irrigation
Water Reuse	Greywater reuse, treated wastewater
Groundwater Conservation	Groundwater recharge, controlled extraction
Household Water Efficiency	Domestic water-saving practices
Community Conservation	Community-based conservation, awareness

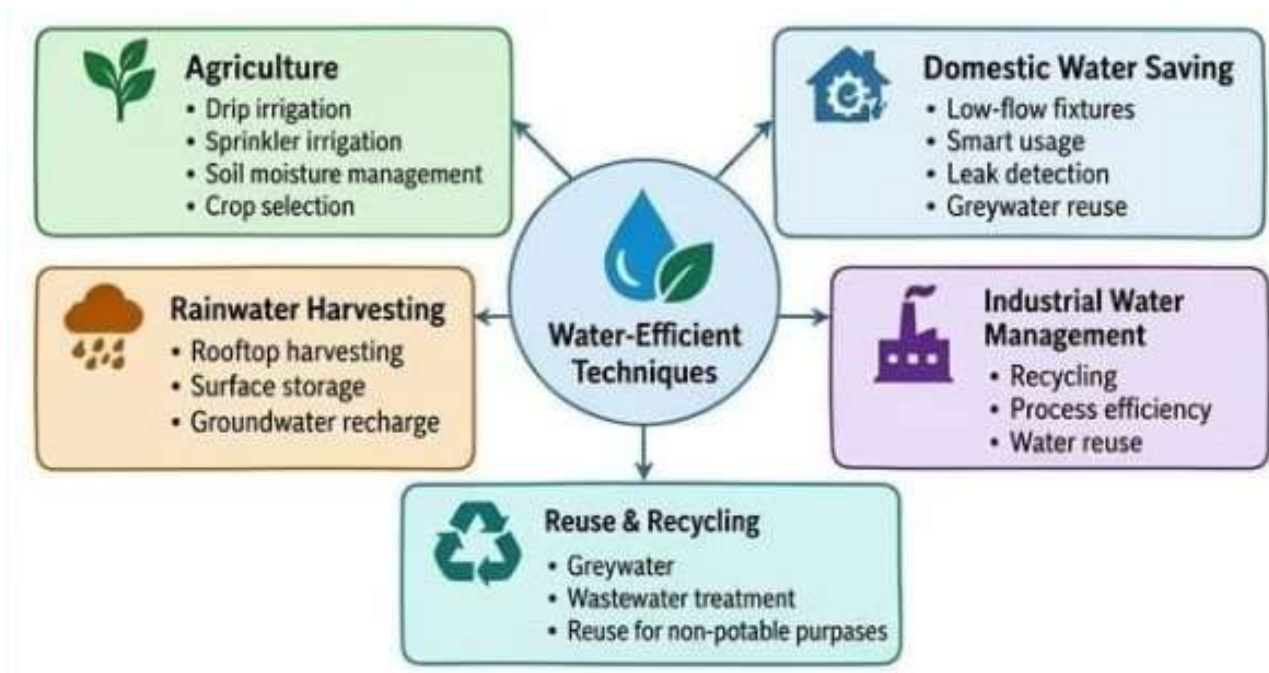


Figure 1: Categories of Water-Efficient Techniques

4.2 Knowledge-Sharing Requirements

The analysis identified several requirements for an effective digital knowledge-sharing platform:

Requirement	Purpose
Centralized Storage	Organize water-related information
Search and Browsing	Easy access to information
Categorization	Arrange techniques systematically
Article Creation and Editing	Add and update knowledge
References/Source Verification	Improve reliability of information
User Contribution	Support collaborative knowledge sharing
Regular Updating	Keep information current
Community Practices	Local and community-level initiatives

These requirements provide the basic structure for organizing water-efficiency information through a Wiki-based platform

4.3 Proposed Wiki-Based Platform Structure

Based on literature analysis, a conceptual Wiki-based platform structure was developed. The proposed platform connects users with a centralized water-knowledge repository.

The structure includes:

Users → Search/Browse → Water Knowledge Repository → Water-Efficient Techniques → Detailed Information → References/Source Verification

Each knowledge article can include the technique name, category, description, method/procedure, benefits, application area, precautions, and references. This structure allows information from different sources to be organized in a consistent format.

User Interaction Architecture & Data Flow Flowchart



Figure 2: Proposed Wiki-based platform Framework



4.4 Existing Information Sources:

The study identified different types of sources that can contribute information to the proposed platform

Source Type	Main Information
Government Reports	Policies, schemes and water-management initiatives
International Organizations	Global water challenges and sustainable practices
Research Papers	Scientific studies and technical approaches
Institutional Publications	Guidelines and practical information
Digital Platforms	Online access and information dissemination

The study mainly relies on secondary information from recognized organizations and academic sources rather than primary participant data

4.5 Summary of Results

The results indicate that relevant information about water-efficient techniques is available from multiple reliable sources, but it can be organized into a centralized Wiki-based knowledge-sharing structure. The proposed platform provides categories, searchable information, article organization, references, and collaborative features.

The findings therefore provide a conceptual basis for using digital knowledge sharing to improve the accessibility and dissemination of water-efficiency information.

V.DISCUSSION

5.1 Interpretation of Findings

The findings indicate that water-efficient techniques are available across different areas such as agriculture, household water use, rainwater management, water reuse, and groundwater conservation. However, the related information is distributed across different reports, research papers, websites, and institutional sources. A centralized digital platform can organize this information into structured categories and make it easier for users to search and access relevant knowledge.

The proposed Wiki-based approach combines water-management knowledge with collaborative digital knowledge sharing. Users can access information about different techniques and, where appropriate, contribute to or update knowledge articles. The literature on Wiki-based knowledge building also supports the potential of collaborative environments for knowledge creation and sharing.

5.2 Implications

The proposed platform can have several potential implications:

- Centralized Knowledge:** Water-efficiency information can be organized in one location
- Easy Accessibility:** Users can search and browse information according to their needs.
- Knowledge Sharing:** Students, farmers, researchers, communities, and other stakeholders can access relevant information.
- Collaborative Contribution:** Users can potentially contribute to and update knowledge of articles.
- Source-Based Information:** References and source verification can help maintain the reliability of information.
- Awareness:** Organized information may support awareness of water conservation practices.

5.3 Limitations

The present study is primarily based on secondary data and conceptual platform design. It does not include a large-scale



user survey, questionnaire, interview, or participant-level dataset. Therefore, the actual usability and effectiveness of the proposed platform have not been empirically measured. The study also does not establish whether access to the proposed platform will directly change users' water-use behaviour. The effectiveness of different water-efficient techniques may also vary according to geographical, climatic, agricultural, and local conditions.

5.4 Future Research Directions:

Future research can evaluate the proposed platform through usability testing and surveys involving farmers, students, communities, and water-management professionals. Further studies can measure user engagement, knowledge improvement, and adoption of water-efficient practices after using the platform. The system can also be enhanced with multilingual support, mobile applications, expert verification, geographic information, recommendation systems, and AI-assisted search.

Overall, the discussion indicates that a Wiki-based digital knowledge-sharing platform can provide a structured technological approach for improving access to water-efficiency knowledge. However, its long-term effectiveness would depend on content quality, user participation, verification mechanisms, accessibility, and further empirical evaluation

VI. CONCLUSION

Water scarcity is a growing challenge that requires effective water conservation, efficient water use, and better access to reliable information. This research examined the use of a Wiki-based digital knowledge-sharing platform for sharing water-efficient techniques and methods for minimizing water scarcity.

The study identified important categories of water-efficient practices, including rainwater management, agricultural water efficiency, water reuse, groundwater conservation, household water efficiency, community conservation, and sustainable water management. The findings also showed that relevant information is available from different government, international, institutional, and research sources but is distributed across multiple platforms.

Based on these findings, a conceptual Wiki-based platform was proposed to organize water-related knowledge in a centralized and accessible manner. Features such as search and browsing, categorization, article creation and editing, source references, and collaborative knowledge sharing can help users access and share information about water-efficient techniques.

The proposed approach provides a structured foundation for digital knowledge sharing in the field of water management. However, its actual usability and effectiveness need to be evaluated through future prototype development, user testing, expert verification, and assessment of user engagement and knowledge improvement

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