International Journal of Environmental Sciences
ISSN: 2229-7359
Vol. 11 No. 18s, 2025
https://www.theaspd.com/ijes.php

Disseminating Knowledge On Water Conservation: A Multidisciplinary Study From Ottapalam, Kerala

Stany Mariya Joji[1], Dr. S. Rajalakshmi[2]

[1]Research Scholar, Department of Home Science Extension Education, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, Tamil Nadu 641043, ORCID: 0000-0003-2460-8427 Mail ID: 22phexf001@avinuty.ac.in
[2]Professor & Head, Department of Home Science Extension Education, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, Tamil Nadu 641043
[1,2]Department of Home Science Extension Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, Tamil Nadu, India.

Abstract
Water conservation is an urgent necessity in the face of increasing global water stress, climatic instability, and unsustainable water use patterns. Despite the development of various water-saving technologies and traditional conservation practices, awareness and knowledge dissemination among communities remain limited. This paper explores the impact of knowledge dissemination on water conservation with special reference to Ottapalam, a semi-urban region in Palakkad district, Kerala, India. Adopting a multidisciplinary approach that integrates sociological inquiry, environmental education, and communication studies, the research examines the effectiveness of different dissemination channels—digital media, folk media, local institutions, and formal education.
Based on a mixed-methods research design, the study combines quantitative data from 300 households with qualitative insights from focus group discussions and key informant interviews. Findings reveal that awareness alone does not ensure behavioural change; socio-cultural, economic, and infrastructural factors deeply influence the adoption of water conservation practices. Local governance bodies, particularly the Krishibhavan and panchayats, play a vital role but face resource and communication barriers. The paper advocates for participatory knowledge dissemination methods using culturally resonant tools and suggests policy interventions to integrate water literacy within educational, administrative, and community development frameworks.
This research contributes to the international discourse on environmental sustainability by highlighting community-centric strategies for effective water management

Keywords: *Water Conservation, Knowledge Dissemination, Sustainability, Participatory Education, Environmental Literacy, Kerala, Community Engagement.*

1. INTRODUCTION

Water is the cornerstone of life, essential for sustaining ecosystems, agriculture, human health, and economic development. From the functioning of cells in living organisms to the regulation of climate systems, water plays an irreplaceable role. Yet, despite its critical importance, the global community faces an escalating water crisis, primarily driven by anthropogenic factors such as climate change, population expansion, urbanization, and industrialization. According to recent assessments by the United Nations and the World Bank, by the year 2030, the global demand for freshwater is projected to exceed supply by 40%, if current usage patterns continue and effective water management strategies are not implemented (UN-Water, 2021; World Bank, 2022). This projection highlights the urgency of adopting water conservation measures not only at governmental or institutional levels but also within households and communities.

In the Indian context, water-related issues are especially paradoxical. India is home to approximately 18% of the world's population but has access to only 4% of its freshwater resources. The situation is further complicated by uneven geographical distribution and temporal variability in rainfall. Kerala, a state located in the southwestern part of India, presents a unique scenario. Known for its high annual rainfall—ranging from 2500 to 3500 mm—Kerala might appear water-abundant on the surface. However, many regions within the state face periodic water shortages, especially during summer months. This contradiction points toward structural inefficiencies in water management, poor conservation practices, and a general lack of awareness among the populace regarding sustainable water use.

Ottapalam, a semi-urban town in the Palakkad district of Kerala, epitomizes the challenges and opportunities of water conservation in ecologically sensitive and culturally rich regions. With a rapidly growing population and a socio-economic fabric that still heavily relies on agriculture, Ottapalam stands at a crossroads between tradition and modernization. This dual character makes it an important case for studying the socio-cultural dynamics that influence water management practices. The region is dotted with rivers, ponds, and traditional water harvesting systems; however, many of these have fallen into neglect due to urban development, lifestyle changes, and limited community engagement. Despite multiple interventions by government bodies, NGOs, and educational institutions, a significant gap persists between the availability of water conservation knowledge and its actual application at the grassroots level.

Water conservation is not merely a technological issue that can be resolved through engineering solutions like rainwater harvesting systems or drip irrigation. It is equally a behavioural, educational, and sociological concern. Studies across the globe emphasize that awareness and education are pivotal in shaping water-use behaviour. The way individuals and communities perceive water whether as an infinite resource or a precious commodity significantly influences their daily consumption patterns. Thus, instilling a culture of water conservation demands a multi-pronged approach that integrates scientific knowledge with traditional practices, social norms, and cultural values.

In this context, knowledge dissemination becomes a central concept. It refers to the process of transmitting relevant, understandable, and actionable information from various sources such as government agencies, educational institutions, NGOs, and media to target audiences, including households, farmers, women's groups, students, and the general public. Effective dissemination is not just about information delivery but ensuring that the knowledge shared is contextualized, internalized, and transformed into sustainable practices. Moreover, dissemination must be inclusive, catering to the linguistic, technological, and socio-economic diversity of the population.

In Ottapalam, various actors are involved in spreading awareness about water conservation. These include local self-governments like the Panchayats, agricultural advisory centers such as Krishibhavans, women empowerment collectives like Kudumbashree, community-based organizations, and schools and colleges. Additionally, informal channels such as WhatsApp groups, folk performances, and religious gatherings also serve as mediums for transmitting conservation messages. However, the effectiveness of these dissemination efforts varies widely, often limited by barriers such as digital illiteracy, lack of localized content, gender-based role expectations, and apathy or lack of perceived urgency.

This paper seeks to explore how knowledge about water conservation is disseminated among various demographic groups in Ottapalam and how this knowledge is received, interpreted, and ultimately acted upon. It also examines the role of institutions formal and informal in shaping environmental awareness and behaviours. The study uses a multidisciplinary framework, drawing insights from sociology, environmental science, communication studies, and development theory. A combination of qualitative and quantitative methods, including household surveys, interviews, and focus group discussions, was employed to capture the complex interplay between information flow, community perceptions, and actual practices.

The objective is not only to identify existing gaps in water literacy but also to offer actionable recommendations for designing more effective knowledge dissemination strategies. By situating the findings within the local socio-cultural milieu of Ottapalam, the study contributes to the broader discourse on environmental education and sustainable development. Furthermore, the research aligns with national and international policy goals, such as India's Jal Shakti Abhiyan and the United Nations Sustainable Development Goal 6 (Clean Water and Sanitation), both of which emphasize community participation and education in achieving water sustainability.

Water conservation must be reframed not merely as a scientific imperative but as a societal movement grounded in knowledge sharing, participatory governance, and behaviour change. The study of Ottapalam serves as a microcosm for understanding the multifaceted challenges of water conservation in transitioning societies and underscores the need for a more holistic, inclusive, and sustained approach to knowledge dissemination.

2. REVIEW OF LITERATURE

Understanding the dynamics of water conservation, especially in the context of knowledge dissemination and community participation, requires an interdisciplinary examination of global and local scholarship. This section

synthesizes the existing literature across four broad thematic areas: global water conservation perspectives, water management in India, theories of knowledge dissemination and behavioural change, and the significance of community participation and water literacy.

2.1 The Global Context of Water Conservation

Water conservation has emerged as one of the most pressing global environmental concerns of the 21st century. The depletion of freshwater resources, exacerbated by climate change, pollution, and over-extraction, has prompted researchers, policymakers, and international organizations to re-evaluate water management strategies. Falkenmark and Rockstrom (2004), in their seminal work, draw attention to the "blue water" and "green water" paradigm, arguing for an integrated approach to water resource management that considers both the physical availability of water and its ecological functions. They emphasize that the overuse of freshwater resources, especially in agriculture, leads to hydrological imbalances and ecological stress, ultimately undermining long-term sustainability.

International frameworks such as the United Nations Sustainable Development Goals (SDGs) and UNESCO's *World Water Development Reports* (2020, 2023) consistently highlight the urgency of transitioning from centralized, top-down water management systems to inclusive, participatory, and community-based models. The 2023 report by UNESCO underscores the importance of recognizing water as a human right and calls for stronger cross-sectoral collaboration to ensure equitable access to clean water and sanitation (SDG 6). It also emphasizes the need for knowledge platforms that are inclusive and culturally relevant, tailored to specific community needs and capacities.

Moreover, international case studies such as rainwater harvesting in sub-Saharan Africa, community-led watershed management in Latin America, and urban water recycling in Australia demonstrate the effectiveness of decentralized, citizen-led water conservation initiatives. These examples highlight that successful interventions rely not only on technological solutions but also on social mobilization, institutional support, and continuous knowledge dissemination.

2.2 Water Management in India

India's historical relationship with water is rich and multifaceted. Traditional systems like step wells, tanks, surangams, and rainwater harvesting pits are testaments to the country's indigenous knowledge in managing water sustainably across diverse ecological zones. Scholars such as Agarwal and Narain (1997) have extensively documented these practices in their influential volume *Dying Wisdom*, advocating for the revival of traditional water management systems as integral components of sustainable development strategies. They argue that modernization and urbanization have often ignored or disrupted these traditional systems, leading to increased dependence on piped water and large-scale infrastructure projects that are not always sustainable or equitable.

Post-independence water policies in India, such as the National Water Policy (2002, revised in 2012), have recognized the need for integrated and participatory approaches. However, implementation often remains inconsistent, hindered by institutional fragmentation, lack of community engagement, and inadequate focus on behaviour change. The Atal Bhujal Yojana and Jal Shakti Abhiyan are recent central government initiatives that promote groundwater recharge and water awareness, but their effectiveness hinges on local participation and capacity building.

In Kerala, a state known for its high literacy rates and social development indicators, the water scenario presents a paradox. Despite receiving one of the highest annual rainfalls in the country, many parts of Kerala, including districts like Palakkad, experience acute water scarcity during dry seasons. The *Kerala State Water Policy* (2021) acknowledges this irony and attributes it to the degradation of water bodies, loss of catchment areas, and the breakdown of traditional conservation systems. The policy stresses the importance of public awareness, school-based water literacy programs, and decentralized governance mechanisms. However, studies show that public participation in these schemes often remains superficial, with limited translation of awareness into action (Ramachandran & Varghese, 2020).

2.3 Knowledge Dissemination and Behavioural Change

The effectiveness of water conservation efforts is closely tied to how knowledge is communicated and internalized. Everett Rogers' *Diffusion of Innovations* (2003) provides a foundational framework for understanding how new

ideas and practices spread within communities. According to Rogers, five key factors influence the adoption of innovations: relative advantage, compatibility, complexity, trialability, and observability. In the context of water conservation, practices that align with local customs, are easy to adopt, and provide visible benefits tend to be more successful. Moreover, opinion leaders and early adopters play a crucial role in influencing community behaviour.

Dissemination, therefore, is not simply the distribution of information through leaflets or announcements. It involves creating dialogic and participatory platforms where communities can engage with new knowledge, relate it to their lived experiences, and collectively decide to adopt sustainable behaviours. Paulo Freire's (1970) concept of *participatory education* emphasizes this dialogical model, where knowledge is co-created through mutual learning rather than imposed from above. In his model, the educator and the learner engage in critical reflection and action (*praxis*), which leads to empowerment and transformation.

In recent years, digital media platforms like WhatsApp, YouTube, and community radio have emerged as powerful tools for disseminating environmental knowledge. However, the *digital divide*—differences in access to technology and digital literacy—continues to limit their reach, particularly among women, the elderly, and socio-economically disadvantaged groups. This limitation calls for hybrid approaches that combine traditional media, interpersonal communication, and digital tools to maximize impact.

2.4 Community Participation and Water Literacy

Water literacy refers to the ability to understand, evaluate, and make informed decisions regarding water use and conservation. Several studies in the Indian context emphasize that higher water literacy correlates with more sustainable water practices (Kumar, 2010; Singh, 2017). Community participation in water management not only fosters local ownership but also enhances accountability and long-term sustainability. For instance, Singh (2017) found that village-level water committees in Rajasthan significantly improved groundwater levels through collective decision-making and community monitoring.

However, challenges remain in ensuring equitable participation. Women and marginalized communities often face barriers in accessing information and participating in decision-making forums. These barriers are rooted in structural inequalities related to caste, class, and gender. Hence, water literacy campaigns must be inclusive, gender-sensitive, and culturally relevant. Culturally rooted methods such as folk theatre, street plays, storytelling, and school-led programs have been found effective in rural Kerala, as they blend entertainment with education (Nair & Joseph, 2019).

Furthermore, institutions such as Krishibhavan (Agricultural Offices), Kudumbashree (women empowerment groups), and local self-governments have been recognized as pivotal in bridging the gap between knowledge producers and community members. However, their success varies based on institutional capacity, funding, and leadership. Studies by Mathew and Kurien (2020) show that when these institutions actively collaborate and engage in participatory planning, knowledge dissemination becomes more impactful.

The literature clearly establishes that water conservation is not merely a technical issue but a deeply social and communicative one. While global frameworks advocate for integrated water management, local experiences reveal the complexity of translating knowledge into action. Dissemination must move beyond awareness to fostering genuine understanding, engagement, and behavioural change. In contexts like Ottapalam, where cultural richness meets ecological vulnerability, community-driven and context-sensitive knowledge dissemination holds the key to water sustainability.

3. OBJECTIVES AND RESEARCH QUESTIONS

Objectives

- To assess the current level of knowledge and awareness about water conservation among households in Ottapalam.
- To examine the effectiveness of various knowledge dissemination methods.
- To evaluate the role of local institutions in promoting water conservation awareness.
- To identify socio-demographic factors affecting knowledge adoption and implementation.

Research Questions

1. What are the primary sources of water conservation knowledge in Ottapalam?
2. How effectively is this knowledge disseminated across different demographic groups?
3. What role do local institutions such as Krishibhavan and Panchayats play in promoting water literacy?
4. What barriers hinder the adoption of water-saving practices despite awareness?

4. METHODOLOGY

The methodology adopted in this study is carefully designed to explore the dynamics of knowledge dissemination related to water conservation, with a specific focus on the local community of Ottapalam in Kerala. Given the multifaceted nature of the research topic encompassing environmental behaviour, communication processes, institutional practices, and socio-cultural contexts - a mixed-methods approach was deemed most suitable. This section outlines the research design, study area, sampling strategy, data collection tools, and data analysis methods employed in the study.

4.1 Research Design

The research adopts a mixed-methods design, integrating both quantitative and qualitative data to provide a comprehensive understanding of the dissemination and adoption of water conservation knowledge. The rationale for using this design lies in its capacity to triangulate findings, validate results, and offer both breadth and depth in analysis. Quantitative data provides measurable insights into the level of water literacy, awareness, and adoption of conservation practices across different population segments. In contrast, qualitative data sheds light on the underlying attitudes, cultural influences, institutional dynamics, and personal experiences that shape water-related behaviours.

The use of triangulation the process of using multiple data sources, methodologies, and theoretical perspectives helps enhance the reliability and validity of findings. The integration of statistical tools, field observations, and narrative analysis ensures that both numerical trends and social contexts are adequately captured.

4.2 Study Area

The study was conducted in Ottapalam Taluk, located in the Palakkad district of Kerala, a state in southern India. Ottapalam is characterized by a unique blend of semi-urban settlements, traditional agrarian communities, and increasing urbanization. The region experiences high annual rainfall but paradoxically faces seasonal water shortages. It is also known for its vibrant civic participation and socio-cultural diversity.

Ottapalam was chosen as the study site due to several reasons:

- It is a representative microcosm of the challenges faced by ecologically sensitive regions undergoing rapid transformation.
- It hosts a variety of water conservation efforts, both government-led and community-based.
- The area presents a mix of high literacy rates and varied levels of water awareness, making it ideal for studying gaps in knowledge dissemination and behavioural adoption.
- Existing institutions such as Krishibhavans (agricultural extension centers), Panchayats (local self-governments), Kudumbashree units (women's self-help groups), and local NGOs play active roles in environmental and development initiatives.

4.3 Sampling

The study utilized a stratified random sampling technique to ensure representativeness across demographic and socio-economic groups. The sample size comprised 300 households, selected from different parts of the Ottapalam Taluk, encompassing both urban and rural wards. Stratification was based on key variables including:

- Geographic location: Urban, semi-urban, and rural divisions
- Gender: Male-headed and female-headed households
- Age group: Youth (18–30), middle-aged (31–60), and elderly (60+)
- Occupation: Farmers, government employees, private sector workers, daily wage labourers, homemakers, and students

In addition to household respondents, purposive sampling was used to select participants for qualitative tools such as Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs). This ensured inclusion of individuals with specific knowledge or experience in water conservation and community engagement. A total of:

- 6 FGDs were conducted (2 each with women's groups, farmers, and youth)
- 10 KIIs were held with key stakeholders including Krishibhavan officials, Panchayat members, school teachers, and NGO coordinators

4.4 Data Collection Tools

A combination of primary and secondary data collection tools was employed to generate a robust data set. These included:

1. Structured Questionnaires

A structured questionnaire was administered to all 300 households. It consisted of both close-ended and Likert-scale-based questions, covering the following themes:

- Sources of water for domestic and agricultural use
- Awareness of water conservation methods (e.g., rainwater harvesting, drip irrigation)
- Sources of information (government schemes, NGOs, media, peers)
- Water use behaviour and practices
- Perceptions of water scarcity and climate change
- Attitudes toward conservation efforts and willingness to adopt new practices

2. Focus Group Discussions (FGDs)

FGDs provided a platform for collective reflection and discussion. Separate discussions were held with:

- Women's collectives (mainly Kudumbashree members) to explore domestic water management, traditional knowledge, and gendered roles in water use
- Farmers to understand agricultural water needs, institutional support, and the adoption of sustainable irrigation
- Youth groups to analyse the influence of digital media, school education, and volunteerism in water awareness

Each FGD had 8–10 participants and lasted approximately 60–90 minutes.

3. Key Informant Interviews (KIIs)

Key informants provided expert perspectives on water governance and outreach. Semi-structured interviews were conducted with:

- Officials from the Krishibhavan and Panchayat offices
- Teachers and principals from local schools
- NGO representatives working on water and environment
- Local media personnel involved in environmental communication

KIIs focused on strategies for knowledge dissemination, challenges in implementation, institutional coordination, and perceptions of public engagement.

4. Content Analysis

A content analysis was performed on water awareness campaigns conducted in the region over the past five years. This included:

- Government pamphlets and posters
- Kudumbashree training materials
- Social media campaigns (Facebook pages, WhatsApp forwards)
- Articles and news coverage in local newspapers and radio programs

This analysis aimed to assess the language, messaging, visual elements, and target audience engagement of existing materials.

4.5 Data Analysis

The data collected were analyzed using both quantitative and qualitative techniques:
Quantitative Analysis:
Data from the household surveys were entered into SPSS for statistical processing. Descriptive statistics such as frequencies, percentages, and means were calculated to summarize awareness levels and behavioural trends. Cross-tabulations were performed to examine associations between variables like gender and water awareness, occupation and conservation practices, and location and access to information. Correlation and chi-square tests were used to identify statistically significant relationships.

Qualitative Analysis:
Data from FGDs and KIIs were transcribed and subjected to thematic analysis using manual coding and NVivo software. Themes such as "barriers to knowledge uptake," "role of women in water management," "trust in institutions," and "traditional vs modern practices" were identified. The narrative data helped contextualize and interpret the quantitative findings, offering a richer understanding of social and cultural dynamics.
The mixed-methods approach adopted in this study facilitates a nuanced understanding of how water conservation knowledge is shared and acted upon in Ottapalam. By combining statistical evidence with qualitative insights, the methodology ensures both empirical rigor and contextual sensitivity. It provides a strong foundation for the analysis and discussions presented in subsequent sections of this research paper.

5. FINDINGS AND ANALYSIS
This section presents the results derived from both quantitative and qualitative data, highlighting the levels of awareness, sources of knowledge, institutional roles, and barriers to effective dissemination regarding water conservation in Ottapalam. The analysis focuses on household-level perceptions, institutional dynamics, and communication processes influencing water literacy and sustainable water management practices. The findings are structured around five key themes: awareness levels, knowledge sources, institutional roles, barriers to dissemination, and socio-cultural influences.

5.1 Awareness Levels
One of the central objectives of the study was to assess the level of awareness regarding water conservation practices among the residents of Ottapalam. The survey revealed that a significant proportion of respondents 78% were aware of at least three standard water conservation techniques. This included rainwater harvesting (RWH), fixing household leaks, greywater reuse, use of water-efficient fixtures, and timed irrigation practices.
Age and Educational Influence
A closer look at the demographic correlations shows that awareness was notably higher among younger respondents (ages 18–35) and those with at least a secondary level of education. Among this group, 87% could identify multiple conservation strategies, compared to just 54% among respondents above 60 years of age. Similarly, respondents with graduate or postgraduate education showed deeper understanding of water policy frameworks and technical conservation methods.
Practice vs. Awareness
However, a significant gap between awareness and action emerged from the analysis. While 78% of respondents demonstrated knowledge, only 46% reported consistent practice of water conservation measures. The remaining group cited various reasons for non-adoption, including lack of resources, uncertainty about techniques, and absence of institutional support.
“We know about rainwater harvesting, but setting it up is costly. We have to prioritize daily expenses,” said a female respondent from a lower-income rural household.
This observation is consistent with findings in diffusion research, where awareness is a necessary but insufficient condition for behaviour change unless supported by enabling environments.

Table 1: Awareness vs. Practice of Water Conservation Techniques

Technique	**Awareness** (%)	**Practice** (%)
Rainwater Harvesting	84%	41%
Fixing Household Leaks	76%	52%

Technique	Awareness (%)	Practice (%)
Greywater Reuse	61%	31%
Use of Water-efficient Devices	58%	24%
Community Well Recharge Efforts	48%	19%

5.2 Sources of Knowledge

To evaluate the effectiveness of dissemination channels, respondents were asked to identify where they first learned about water conservation. Responses highlighted the increasingly hybrid nature of information flows, combining mass media, social media, and traditional community-based methods.

Mass and Social Media

Television (65%) emerged as the most common source of water conservation knowledge, especially among older and middle-aged populations. WhatsApp (53%) followed closely, indicating the significant role of peer-shared content in mobile-based platforms.

Community Meetings and Folk Arts

Interestingly, among rural and elderly respondents, community gatherings, Panchayat meetings, and folk-art performances such as *Kakkarissi Natakam* and *Ottamthullal* that included environmental themes were cited as powerful and memorable sources of information.

Role of Educational Institutions

While school and college eco-clubs had limited reach, their role was generally positive. Respondents under 25 mentioned that water audits, exhibitions, and planting drives helped increase awareness but often lacked follow-up. Teachers interviewed during KIIs admitted that curricular load and lack of training limited consistent environmental education.

5.3 Role of Local Institutions

The research explored the function and effectiveness of local institutions such as Krishibhavan, Panchayats, Kudumbashree units, and NGOs in promoting water conservation.

Krishibhavan

Krishibhavans are agricultural extension centers that play a vital role in training farmers. The study found that the Krishibhavan in Ottapalam conducted periodic awareness programs and demonstrations of micro-irrigation. However, staffing shortages and inconsistent outreach affected their impact. Only 28% of farmer households reported any interaction with Krishibhavan officers in the past year.

Panchayats and NGOs

Panchayats often partnered with local NGOs such as Jalanidhi and Shreyas to conduct water conservation workshops, particularly targeting households dependent on open wells. Yet, coverage remained partial, with workshops conducted primarily in wards closer to town centers.

Kudumbashree Units

Kudumbashree women's collectives stood out as effective peer educators and community motivators. Through neighborhood meetings, they facilitated discussions on rainwater harvesting, tank cleaning, and hygiene. FGDs with Kudumbashree members revealed a strong emphasis on linking water conservation to daily life and household savings, making the issue more relatable.

Table 2: Perceived Effectiveness of Institutions in Water Knowledge Dissemination

Institution	Reach (%)	Perceived Effectiveness (1–5 scale)
Krishibhavan	28%	3.4
Panchayats	34%	3.1
NGOs	21%	3.7
Kudumbashree Units	47%	4.3
Schools/Colleges	26%	3.5

5.4 Barriers to Effective Dissemination

Despite multiple channels and efforts, the study found several critical barriers that hindered effective dissemination and adoption of water conservation knowledge.

Language and Local Context

One of the most recurring concerns was the lack of locally contextualized content in Malayalam. Many campaign materials were either too technical or poorly translated, which impacted comprehension, particularly among older and less-educated groups.

Digital Divide

While digital media like WhatsApp were popular, older and economically disadvantaged respondents reported being excluded due to low digital literacy, lack of smartphones, or unreliable connectivity. This divide was especially visible among women over 50 in rural wards.

Gendered Participation

Despite the active role of Kudumbashree, many women—especially homemakers—expressed that they were rarely invited to Panchayat-level water meetings or training programs, which were seen as male-dominated forums. Cultural norms around public speaking, mobility, and time poverty (due to unpaid domestic labor) limited their participation.

5.5 Emerging Themes and Socio-Cultural Dynamics

Qualitative analysis from KIIs and FGDs pointed to several underlying themes influencing water knowledge dissemination and conservation behaviours:

Trust and Credibility

People were more likely to act on information when it came from trusted local leaders, teachers, or peer group members, rather than distant government officials or mass media. This finding supports Roger's diffusion model where opinion leaders catalyze behavioural adoption.

Collective Memory and Traditional Wisdom

Several elderly respondents recalled ancestral water management practices like *Surankas*, *kulams*, and *kavus* (traditional ponds), which had community ownership. A sense of cultural nostalgia was evident, with calls to revive these practices in modern forms.

Rituals and Religious Engagement

In several villages, temple festivals and church gatherings were identified as under-utilized platforms for environmental messages. In areas where religious leaders collaborated with NGOs, messages had higher moral appeal and community resonance.

The findings reveal a nuanced picture of water conservation knowledge dissemination in Ottapalam. Awareness is relatively high, particularly among the younger and educated populations, but practice lags behind. Traditional and digital channels coexist, yet inclusion gaps remain—driven by language, technology access, and socio-cultural roles.

Local institutions, especially Kudumbashree units, emerge as crucial players in bridging formal campaigns and grassroots realities. The study underscores that effective water literacy cannot rely on information transfer alone; it must account for trust, cultural relevance, accessibility, and behavioural enablers. The following section will delve into a broader discussion of these insights, linking them to theoretical frameworks and policy implications.

6. DISCUSSION

The dissemination of knowledge on water conservation is not a linear or uniform process. As evidenced in the findings from Ottapalam, knowledge dissemination must be contextual, participatory, and inclusive in order to translate awareness into sustained behaviour change. This section discusses the core insights derived from the study, situating them within theoretical frameworks and broader discourses on environmental communication, behaviour change, and participatory development.

6.1 From Awareness to Action: Bridging the Intention-Behaviour Gap

While a majority of the respondents (78%) in Ottapalam exhibited a basic awareness of water conservation techniques, only 46% engaged in regular practice. This intention-behaviour gap is a well-documented

phenomenon in environmental behaviour literature. According to Ajzen's Theory of Planned Behaviour (1991), knowledge alone is insufficient for behavioural change; attitudes, perceived behavioural control, and social norms also play decisive roles.

In Ottapalam, individuals often lacked the confidence, motivation, or enabling conditions to apply their knowledge. Rainwater harvesting, though widely known, was practiced less than expected due to cost barriers and technical complexity. Fixing leaks was seen as a low-priority task in many households unless accompanied by visible wastage. These findings reinforce that effective dissemination must not only inform but also empower and support communities to act.

6.2 The Importance of Contextualized and Participatory Dissemination

The study underscores that knowledge dissemination is most effective when tailored to the social, cultural, and linguistic context of the community. Standardized government pamphlets or social media ads often failed to resonate with elderly, rural, or digitally disconnected populations. In contrast, storytelling formats, community plays, street performances, and peer-led demonstrations proved to be emotionally engaging and cognitively accessible.

Participatory methods such as Kudumbashree-led neighborhood meetings allowed for dialogue, feedback, and contextual problem-solving. This is in line with Paulo Freire's participatory education model, which emphasizes mutual learning and critical consciousness. Unlike top-down information transfer, participatory dissemination builds ownership and trust, making behavioural change more sustainable.

Moreover, cultural anchoring—such as using local metaphors, referencing traditional water practices, or delivering messages during religious or social events—was found to enhance audience receptivity and memory retention. These findings suggest that cultural fluency is as critical as scientific accuracy in environmental education.

6.3 The Role of Local Institutions: Between Potential and Constraints

Local institutions in Ottapalam—particularly Krishibhavan, Kudumbashree units, Panchayats, and NGOs—acted as intermediaries between formal knowledge systems and the local populace. Their role as trusted, visible, and culturally embedded agents positioned them uniquely to disseminate knowledge.

Kudumbashree collectives stood out in particular, as they combined social cohesion with practical relevance. By linking water conservation to daily household savings, health outcomes, and women's empowerment, they provided incentives for adoption that went beyond environmental ethics.

However, despite this potential, local institutions also faced structural limitations. Krishibhavan officers were often overburdened and under-resourced. Panchayat officials cited fragmented coordination with other agencies, leading to program duplication or poor follow-up. Teachers involved in eco-clubs reported a lack of curricular integration and pedagogical tools to conduct meaningful environmental education.

These gaps point to the need for institutional capacity building, improved coordination among stakeholders, and financial incentives for community-based facilitators.

6.4 Multi-Dimensional Drivers of Behavioural Change

A key insight from the study is that water conservation behaviour is driven by a blend of cognitive, emotional, social, and institutional factors. The multidisciplinary lens—drawing from sociology, communication studies, and environmental science—helped identify how different dimensions interact:

- Cognitive: Understanding how and why a technique works (e.g., groundwater recharge from RWH).
- Emotional: Empathy with water-scarce communities, pride in traditional practices, fear of scarcity.
- Social: Peer influence, collective memory, and reputation within the community.
- Institutional: Availability of technical support, materials, and platforms for learning.

This finding supports the Social Practice Theory (Shove et al., 2012), which posits that sustainable behaviour emerges from the convergence of materials (infrastructure), competences (knowledge/skills), and meanings (social norms and values). Effective dissemination strategies must therefore work across all three domains.

6.5 Gender and Inclusivity Considerations

The study also highlights the gendered nature of knowledge dissemination and environmental participation. While women were often the primary users and managers of household water, their access to formal discussions on water governance remained limited due to cultural norms, time constraints, and mobility issues. This calls for gender-sensitive dissemination strategies that actively involve women as knowledge creators and decision-makers. Encouragingly, Kudumbashree provided a platform for this inclusion, demonstrating how women's collectives can redefine the boundaries of public participation and environmental leadership. Future programs must deliberately design content, timings, and locations that are inclusive and accessible to all social groups—especially the elderly, women, and the economically marginalized.

6.6 Implications for Policy and Practice

The study's findings have several implications for designing future water literacy campaigns and conservation initiatives:

- Localized Messaging: Use region-specific language, symbols, and metaphors to increase relatability.
- Integrated Platforms: Combine schools, religious gatherings, women's groups, and digital media to create consistent messaging across life domains.
- Capacity Building: Train local volunteers and institutional actors in environmental communication and participatory methods.
- Monitoring and Feedback: Create simple tools for communities to assess and report their water practices, ensuring two-way learning.
- Financial and Material Support: Provide micro-grants or subsidies for adopting conservation technologies like RWH or water meters.

These strategies should ideally be embedded in a broader watershed-based or basin-level governance framework that links knowledge dissemination to water planning, monitoring, and governance mechanisms.

In sum, this study demonstrates that knowledge dissemination on water conservation is not just about communication—it is about connection, culture, and community. The people of Ottapalam are not passive recipients of information but active agents who interpret, adapt, and sometimes resist messages based on their lived realities.

Therefore, future interventions must move beyond awareness campaigns toward embedded, inclusive, and context-sensitive models of environmental education. Only then can the knowledge of water conservation truly flow—into hearts, habits, and homes.

7. POLICY IMPLICATIONS AND RECOMMENDATIONS

The findings of this study underscore the urgent need to reimagine knowledge dissemination strategies around water conservation, particularly in ecologically sensitive and socially diverse regions like Ottapalam. While the local population displays a commendable level of awareness, translating that awareness into sustained behavioural change remains a challenge. Policymakers, educators, and environmental agencies must move from generic outreach models to localized, participatory, and inclusive frameworks of dissemination. The following policy recommendations aim to inform such a transformation.

7.1 Localization of Content

One of the primary challenges observed in Ottapalam was the limited accessibility of water conservation content. Materials produced at the state or national level often used generic language, lacked visual cues, and were distributed without consideration for local dialects or literacy levels. To improve this, government agencies, NGOs, and educational institutions must prioritize context-specific, multilingual content development.

- Educational materials should be created in Malayalam, incorporating colloquial expressions and metaphors that resonate with local populations.
- Visual aids, such as illustrated posters, infographics, and short videos, should depict familiar scenarios—rural homes, community wells, paddy fields—to enhance relatability.

- Storytelling formats using folk art, narratives, and local legends can emotionally engage audiences, especially the elderly and non-literate individuals.
- Seasonal or festival-based campaigns can amplify reach by tapping into already active community spaces.

This localization not only enhances comprehension but fosters a sense of cultural ownership over water conservation practices.

7.2 Capacity Building of Local Institutions

The role of Panchayats, Krishibhavans, Kudumbashree units, and educational institutions is pivotal in spreading knowledge and inspiring community action. However, many of these institutions lack adequate staffing, training, and resources to undertake systematic outreach.

- Panchayats should be supported with dedicated water literacy officers or field coordinators trained in communication, community mobilization, and participatory tools.
- Krishibhavans need additional human resources and logistical support to conduct household surveys, school visits, and community workshops effectively.
- Cross-training programs can be organized where environmental scientists, sociologists, and communication experts build the capacity of local volunteers and leaders to act as multipliers of water knowledge.
- Government schemes like Jal Shakti Abhiyan and Atal Bhujal Yojana can be linked with decentralized outreach teams for maximum impact.

Capacity building at the grassroots ensures that technical knowledge reaches the last mile in a form that is practical, empathetic, and sustainable.

7.3 Integration of Water Literacy into Formal and Informal Education

Sustainable water use must be inculcated from an early age. At the same time, adult learners and elderly community members should not be left out of the water literacy loop.

- Water conservation modules must be included in school and college curricula, particularly under Environmental Studies or Social Science subjects. These should go beyond textbook information to include field visits, experiments, and project-based learning.
- Eco-clubs and NSS units should be encouraged to take up water literacy campaigns in collaboration with local bodies.
- Adult literacy programs and Continuing Education Centres can integrate short modules on water-saving techniques, indigenous water practices, and home-based conservation strategies.
- Teachers and facilitators must be trained not just in content, but in participatory pedagogy and socio-environmental sensitivity.

An education-led approach ensures the intergenerational transfer of knowledge and instills water ethics as a core social value.

7.4 Digital-Physical Hybrid Campaigns

Given the dual nature of the communication landscape in Ottapalam—where younger populations are digitally savvy while older groups prefer physical interaction—a hybrid communication strategy is essential.

- WhatsApp groups managed by Panchayat or Kudumbashree workers can share regular messages, videos, and reminders about water conservation.
- Community bulletin boards, murals, and wall paintings can visually reinforce messages in public spaces such as bus stops, health centres, and markets.
- Street theatre, puppet shows, and folk performances can travel across villages, combining entertainment with education.
- Interactive kiosks or digital info-corners can be set up in Panchayat offices or schools, providing access to video tutorials and conservation tips.

This hybrid approach ensures no demographic is left behind, enabling deeper and more democratic dissemination of environmental knowledge.

7.5 Inclusive Participation in Planning and Execution

Water conservation efforts must reflect the diversity of the communities they aim to serve. Currently, dissemination campaigns often miss the lived experiences and insights of women, senior citizens, farmers, and other marginalized voices.

- Women should be recognized as central actors in water use and management. Their inclusion in planning discussions and as facilitators ensures practical, home-level interventions are emphasized.
- Senior citizens, with their memory of traditional water practices, can serve as resource persons and custodians of indigenous knowledge.
- Farmers, being among the largest water users, must be actively involved in knowledge creation and validation, not just as recipients.
- Dissemination programs must also be physically accessible and time-sensitive—for example, scheduling meetings at times convenient for agricultural workers or homemakers.

Inclusive participation increases trust, social relevance, and long-term commitment, making water conservation a shared community responsibility.

The water crisis in India is not merely an environmental issue—it is a socio-cultural, economic, and educational challenge. The policy directions outlined above aim to bridge the gap between knowledge and action, especially in semi-urban agrarian regions like Ottapalam. By localizing content, empowering institutions, embedding water literacy into education, using hybrid campaigns, and embracing inclusivity, the state can cultivate a water-conscious society equipped to face the future. Such an approach, rooted in the real experiences of communities, not only improves adoption of water conservation practices but also promotes environmental justice, equity, and resilience.

8. CONCLUSION

Water conservation is not merely a technical or infrastructural challenge—it is a deeply social and cultural endeavor that requires informed, collective, and sustained action. This study, situated in the semi-urban, agrarian landscape of Ottapalam in Palakkad district, Kerala, examined how knowledge about water conservation is disseminated, interpreted, and adopted by local communities. While there is general awareness among the population, especially regarding commonly promoted techniques like rainwater harvesting and fixing leaks, actual practices on the ground reflect a significant implementation gap. This discrepancy stems from a combination of factors, including ineffective communication methods, digital divides, gendered access to information, and lack of local relevance in messaging.

The central finding of the research is that knowledge dissemination is pivotal to the success of water conservation efforts, but it must be approached holistically. A one-size-fits-all strategy does not work, especially in a context like Ottapalam, which encompasses both urbanizing clusters and traditional farming communities. People differ in how they receive, understand, and act upon information. For example, younger respondents tend to rely on digital media, while older individuals prefer interpersonal or community-based forms of learning. Women, often primary users and managers of water in households, are frequently excluded from formal dissemination efforts due to entrenched gender roles.

By adopting a multidisciplinary approach that draws from sociology, environmental science, communication studies, and education, this paper emphasizes the importance of participatory, localized, and inclusive knowledge-sharing practices. Dissemination is not about merely passing down expert information—it involves co-creating knowledge with communities, respecting indigenous wisdom, and addressing the everyday realities of different social groups. Tools such as storytelling, community meetings, folk arts, and peer learning emerge as powerful vehicles of change when implemented with consistency and cultural sensitivity.

Another critical insight is the role of local institutions, such as the Krishibhavan, Panchayats, Kudumbashree units, and schools, in knowledge dissemination. These bodies have deep social networks and enjoy varying degrees

of public trust, making them ideal conduits for environmental education. However, structural constraints such as limited staffing, poor coordination, and lack of capacity often hinder their effectiveness. The study underscores the need for institutional strengthening through training, resource allocation, and policy support, to ensure that these stakeholders are not just implementers but facilitators of behavioural change.

Furthermore, this research contributes to the broader discourse on environmental sustainability in the Global South. The challenges faced in Ottapalam—ranging from water scarcity despite high rainfall, to gaps in policy implementation—are reflective of a larger pattern visible across developing regions. By focusing on knowledge as a transformative tool, and by highlighting the human and institutional dimensions of water conservation, this study offers scalable and adaptable models for similar contexts within India and beyond.

In conclusion, ensuring water sustainability in the 21st century demands more than technological solutions; it requires rethinking how knowledge is created, shared, and lived within communities. Empowering people with the right information, in the right way, at the right time—through trusted networks and participatory platforms—can transform awareness into action. Ottapalam's experience offers a microcosm of both the promise and the challenges of such an approach. With the right policies, institutional backing, and community participation, the lessons from this study can pave the way for a more water-literate and environmentally responsible society.

REFERENCES (APA STYLE)

- Agarwal, A., & Narain, S. (1997). Dying Wisdom: Rise, Fall and Potential of India's Traditional Water Harvesting Systems. Centre for Science and Environment.
- Ajzen, I. (1991). The theory of planned behaviour. *Organizational Behaviour and Human Decision Processes, 50*(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T
- Falkenmark, M., & Rockström, J. (2004). Balancing Water for Humans and Nature: The New Approach in Ecohydrology. Earthscan.
- Government of Kerala. (2021). Water Policy Document. Water Resources Department.
- Government of Kerala. (2021). *Water resources and management: Kerala state report*. Department of Water Resources, Government of Kerala.
- Kumar, M. D. (2010). Water Management in India: What Works, What Doesn't. Global Water Partnership.
- Kumar, S. (2010). Water literacy and community participation in water management: A study in rural India. *Journal of Environmental Studies, 45*(3), 257–274.
- Paulo Freire. (1970). *Pedagogy of the oppressed* (M. B. Ramos, Trans.). Continuum. (Original work published 1968)
- Rogers, E. M. (2003). Diffusion of Innovations (5th ed.). Free Press.
- Shove, E., Pantzar, M., & Watson, M. (2012). *The dynamics of social practice: Everyday life and how it changes*. Sage Publications.
- Singh, A. (2017). Enhancing water literacy for sustainable development: Case studies from India. *International Journal of Water Resources, 12*(1), 45–60.
- Singh, R. (2017). Community Participation in Water Resource Management: Evidence from India. Journal of Environmental Management, 203, 263–271.
- UNESCO World Water Assessment Programme. (2020). *The United Nations World Water Development Report 2020: Water and climate change*. UNESCO Publishing.
- UNESCO World Water Assessment Programme. (2023). *The United Nations World Water Development Report 2023: Water for sustainable development*. UNESCO Publishing.
- UNESCO. (2023). World Water Development Report 2023: Partnerships and Cooperation for Water. Paris: UNESCO.