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A Study on Media Influence on Public Awareness and Behaviour Change of Water Conservation Practices in Chennai

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Abstract

This study investigates the impact of media exposure on public awareness and behavioral responses related to water conservation practices in Chennai, a city frequently experiencing water scarcity. A survey-based research design was employed, collecting primary data from 385 respondents using a structured questionnaire and stratified sampling to ensure representation across socio-demographic groups. The research examines key constructs, including media exposure, media influence, scarcity awareness, environmental awareness, conservation knowledge, conservation advocacy, and behavior change. Data analysis included descriptive statistics, reliability testing, Chi-square tests, ANOVA, regression, and Structural Equation Modeling (SEM). The scale demonstrated strong reliability (Cronbach's Alpha = 0.851). Results indicate that media exposure significantly enhances public awareness, particularly regarding scarcity, environmental understanding, and conservation knowledge. However, the conversion of awareness into actual behavior change is limited, as a substantial proportion of respondents reported minimal or no action. SEM results confirm excellent model fit, establishing media exposure as a central factor influencing media-related perceptions and strong interrelations among the awareness variables. Regression analysis shows that media exposure significantly predicts media influence, while other awareness variables do not exhibit direct significant effects. The study identifies some variations in awareness and media engagement across demographic groups, though these differences are not consistently significant. Barriers such as low motivation, cost constraints, and habitual practices impede behavioral transformation despite sufficient awareness. The findings suggest that although the media is vital for information dissemination, it alone is insufficient to drive sustained conservation behavior. Consequently, targeted, inclusive, and action-oriented communication strategies are essential for promoting effective water conservation practices in urban environments such as Chennai.

Key words: *Water Conservation, Media Influence, Public Awareness, Environmental Communication, Urban Sustainability, Chennai.*

BACKGROUND OF THE STUDY

Urban water scarcity has emerged as one of the most pressing environmental challenges of the 21st century, particularly in rapidly growing metropolitan regions that face increasing hydrological stress due to climate variability, population growth, and unsustainable resource management practices [12]. This issue is not confined to a single region but represents a global concern, affecting both developed and developing nations struggling to maintain sustainable water resources, especially in urban contexts (Saurí, 2013). In India, the crisis is more severe, with cities like Chennai frequently experiencing acute water shortages; the 2019 Chennai water crisis, during which major reservoirs dried up, highlighted the vulnerability of urban water systems and the urgent need for sustainable water management [16][24]. These conditions underscore that water conservation is no longer optional but essential for long-term urban sustainability. Research further indicates that effective water conservation is influenced by a combination of environmental awareness, policy interventions, technological advancements, and active public participation, as individual behavior significantly shapes water consumption patterns. Moreover, global studies emphasize that communication strategies play a crucial role in promoting sustainable practices, particularly in drought-prone regions. Therefore, water conservation must be understood not only as a technical or infrastructural issue but also as a socio-behavioral challenge that requires integrated, awareness-driven, and participatory approaches.

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Public Awareness and Media Influence

Public awareness is fundamental to advancing water conservation practices, as individuals' knowledge and attitudes significantly shape their behaviors. Elevated environmental awareness correlates with greater adoption of water-saving measures, including rainwater harvesting and efficient water use [10]. However, awareness is often unevenly distributed across socio-economic groups, resulting in disparities in conservation practices, as described by the Knowledge Gap Hypothesis. In urban settings such as Chennai, variations in education, income, and access to information further contribute to differences in residents' awareness levels, underscoring the need for inclusive, targeted communication strategies. Mass media play a pivotal role in shaping public perception and influencing environmental behavior. Traditional media, such as television, radio, and newspapers, have historically disseminated information, while digital platforms and social media have broadened the reach and effectiveness of environmental communication through interactive and real-time engagement [9]. Empirical evidence demonstrates that media exposure can substantially enhance awareness and promote conservation-related behaviors by delivering information in accessible and actionable formats [2] [17]. Additionally, emotional appeals and persuasive messaging have been shown to increase audience engagement and improve the effectiveness of communication campaigns [1]. Nevertheless, the impact of media is influenced by factors such as accessibility, credibility, and audience engagement, indicating that media communication alone is insufficient without strategic design. Thus, enhancing public understanding of water conservation requires not only broad awareness initiatives but also well-structured, inclusive, and context-specific communication strategies that address knowledge gaps and foster sustainable behavioral change.

Behavioral Change and Effective Interventions

Behavioral change is essential for effective water conservation, as sustainable outcomes rely on individuals' daily practices and habits. However, awareness alone does not necessarily result in action. Behavioral theories indicate that psychological, social, and contextual factors, including attitudes, beliefs, social norms, and perceived responsibility, significantly influence individuals' willingness to adopt water-saving behaviors [11] Zhong et al., (2019). The Theory of Planned Behavior posits that individuals are more likely to engage in conservation practices when they perceive social approval and possess behavioral control. Demographic factors such as education, income, and household size, as well as experiential factors like direct exposure to water scarcity, also shape water-use patterns and commitment to conservation efforts Willis et al., (2011) [19]. Within this context, media campaigns can serve as catalysts by reinforcing positive attitudes, shaping social norms, and providing practical guidance on conservation techniques [20]. Empirical studies suggest that consistent exposure to conservation messages can result in measurable reductions in household water consumption [25]. In urban environments such as Chennai, where water scarcity is recurrent, promoting behavioral change through targeted, context-specific communication strategies is imperative. Therefore, integrating awareness with actionable, behavior-oriented interventions is critical to bridging the gap between knowledge and actual conservation practices.

Awareness Campaigns Promoting Sustainable Practices

Water conservation campaigns have been implemented across various regions to promote sustainable practices and reduce water consumption. Empirical research demonstrates that well-designed campaigns can significantly improve public awareness and behavior. For example, media-driven initiatives during drought periods have reduced household water use and increased the adoption of conservation techniques [5]. In emerging economies, campaigns that use multiple media channels have been particularly effective at reaching diverse audiences and fostering behavioral change [22]. The effectiveness of these campaigns often depends on their capacity to address local contexts and cultural factors. Additionally, research underscores the importance of continuous engagement and reinforcement to sustain long-term behavioral change, as short-term campaigns may not yield lasting effects.

From a methodological perspective, the application of Structural Equation Modeling (SEM) has become increasingly important in social science and environmental communication research for analyzing complex relationships among variables. SEM allows researchers to test theoretical models involving multiple dependent and independent variables simultaneously, while also incorporating latent constructs [6][7]. The evaluation of model fit is guided by established statistical criteria, including goodness-of-fit indices such as the Normed Fit Index (NFI) and the Comparative Fit Index (CFI), which assess how well the proposed model fits the observed data [4]. Reliability-based indices, such as the Tucker–Lewis Index (TLI), further strengthen model validation by accounting for model complexity [26]. Additionally, parsimony-based measures such as AIC help identify the most efficient model among alternatives [3], while sample adequacy measures such as the Hoelter index ensure the robustness of the model in relation to sample size [14]. These methodological frameworks provide a strong foundation for validating structural relationships in empirical research [8].

In the Indian context, SEM has been increasingly applied in environmental and communication research to examine the behavioral extent of water conservation and public

awareness. Studies have applied SEM to explore how environmental attitudes, media exposure, and socio-demographic factors interact to influence sustainable practices (e.g., Center for Science and Environment reports [23]. Research on urban Indian settings indicates that, while awareness levels are often high, behavioral outcomes are mediated by multiple psychological and contextual variables.

Objectives

1. To measure public awareness of water conservation practices among Chennai residents.
2. To determine the relationship between media influence and public awareness of water conservation practices.
3. To identify variations in awareness levels across different administrative zones of Chennai.
4. To examine the role of demographic factors in influencing awareness and media exposure related to water conservation.

Research Gaps

Despite extensive research on water conservation and media influence, several gaps remain in the existing literature. Most studies focus on macro-level analyses and fail to capture intra-urban variations in awareness and behavior, particularly in developing countries. In the Indian context, limited research has examined the relationship between media exposure and water conservation awareness at the city level, particularly in heterogeneous urban settings such as Chennai. Understanding how media influence correlates with public awareness can provide valuable insights for designing effective communication strategies. Additionally, there is a lack of studies that integrate both traditional and digital media influences within a single analytical framework. The study examines whether media exposure contributes to differential knowledge acquisition across socio-economic groups, consistent with the Knowledge Gap Hypothesis. This highlights the need for localized, data-driven research to understand how media affects different population segments. Addressing these gaps is essential for developing targeted communication strategies that ensure equitable access to information and promote inclusive water conservation practices.

METHODOLOGY

The study adopts a Survey research design to examine the role of the media in shaping public awareness and water conservation practices in Chennai. Primary data were collected using a structured questionnaire distributed among urban residents across different areas of the city. The questionnaire was distributed using a combination of online and offline methods to ensure wider reach and representation. Online data collection was conducted through Google Forms, which was shared via social media platforms such as WhatsApp and email networks. In addition, offline data collection was conducted through direct field visits to selected residential areas across Chennai, where printed questionnaires were administered to respondents. The questionnaire consisted of sections on demographic details, household water usage, awareness levels, media exposure, and behavioral changes related to water conservation. Data collection was carried out from January 2024 to March 2024. A stratified sampling technique was used to ensure representation of diverse socio-economic groups. The collected data were analyzed using descriptive and inferential statistical methods to identify patterns, relationships, and variations in awareness levels. This methodological approach ensures a comprehensive understanding of both media influence and public behavior in the context of urban water conservation.

RESULT & DISCUSSION

The demographic analysis shows that respondents are fairly evenly distributed across age groups, with the highest representation in the 35–44 years age group (21.3%), indicating a mature participant base. The gender distribution is slightly skewed toward females (53.0%) compared to males (47.0%). In terms of education, a significant proportion holds postgraduate (35.1%) and undergraduate degrees (30.1%), reflecting a highly educated sample. Occupationally, most respondents are full-time employees (34.8%), followed by students (20.3%) and homemakers (13.5%). Income data reveal that nearly half of respondents (47.3%) preferred not to disclose their income, suggesting sensitivity to financial information. Among those who responded, lower and middle-income groups are more represented. Overall, the sample reflects a diverse yet educated and economically varied population (Table 1).

Table 1. **Demographic characteristics of respondents**

		Frequency	Percentage
Age	18-24years	68	17.7%
Age	25-34 years	76	19.7%
Age	35-44 years	82	21.3%
Age	45-55 years	77	20.0%
Age	56-65 years	42	10.9%
Age	66-75 years	40	10.4%
Age	Total	385	100.0%
Gender	Male	181	47.0%
Gender	Female	204	53.0%
Gender	Total	385	100.0%
Education Level	Secondary School	24	6.2%
Education Level	High School Diploma	49	12.7%
Education Level	Undergraduate Degree	116	30.1%
Education Level	Postgraduate Degree	135	35.1%
Education Level	Others	61	15.8%
Education Level	Total	385	100.0%
Occupation	Student	78	20.3%
Occupation	Employed (Full-Time)	134	34.8%
Occupation	Employed (Part-Time)	8	2.1%
Occupation	Self-Employed	41	10.6%
Occupation	Unemployed	19	4.9%
Occupation	Retired	30	7.8%
Occupation	Homemaker	52	13.5%
Occupation	Others	23	6.0%
Occupation	Total	385	100.0%
Income Level Monthly	Less than 10,000	62	16.1%
Income Level Monthly	Rs10,001 to Rs 30,000	61	15.8%
Income Level Monthly	30,001 to 50,000	41	10.6%
Income Level Monthly	50,001 to 75,000	16	4.2%
Income Level Monthly	More than 75,000	23	6.0%
Income Level Monthly	Prefer not to say	182	47.3%
Income Level Monthly	Total	385	100.0%

The internal consistency of the scale was assessed using Cronbach's Alpha ($\alpha = 0.851$), indicating strong reliability. The instrument indicates a high level of internal consistency among the variables (Table 2). A total of 385 valid cases were included in the analysis, with no missing or excluded data, ensuring complete dataset integrity. The Cronbach's Alpha value of 0.851 indicates strong reliability for the 31 items used in the study. This suggests that the items are well-correlated and consistently measure the intended construct. Finally, the scale demonstrates good reliability and is suitable for further statistical analysis.

Table 2. **ANOVA test for media exposure with factors**

		Sum of Squares	df	Mean Square	F	Sig.
Media Influence	Between Groups	3988.080	20	199.404	18.632	.000
Media Influence	Within Groups	3895.624	364	10.702		
Media Influence	Total	7883.704	384			
Scarcity Awareness	Between Groups	990.205	20	49.510	8.453	.000
Scarcity Awareness	Within Groups	2131.967	364	5.857		
Scarcity Awareness	Total	3122.171	384			
Conservation Knowledge	Between Groups	935.443	20	46.772	7.856	.000
Conservation Knowledge	Within Groups	2167.190	364	5.954		
Conservation Knowledge	Total	3102.634	384			
Environmental Awareness	Between Groups	958.552	20	47.928	8.017	.000
Environmental Awareness	Within Groups	2176.019	364	5.978		
Environmental Awareness	Total	3134.571	384			
Conservation Advocacy	Between Groups	123.657	20	6.183	5.987	.000
Conservation Advocacy	Within Groups	375.901	364	1.033		
Conservation Advocacy	Total	499.558	384			
Behaviour change	Between Groups	3303.182	20	165.159	2.059	.005
Behaviour change	Within Groups	29196.262	364	80.210		
Behaviour change	Total	32499.444	384			

The ANOVA results indicate that media exposure has a statistically significant impact on all the studied variables. Media Influence shows a very high F value (18.632), indicating strong group differences in media exposure. Scarcity Awareness (F = 8.453) and Environmental Awareness (F = 8.017) also demonstrate notable differences among groups. Conservation Knowledge (F = 7.856) indicates a significant influence of media on understanding levels. Conservation Advocacy presents a moderate yet significant effect (F = 5.987), suggesting media's role in promoting supportive behaviors. Behaviour Change has a comparatively lower F value (2.059), but it remains statistically significant. All variables have significance values of .000 (and .005 for behaviour), confirming strong statistical evidence. This implies that media exposure plays a crucial role in shaping awareness, knowledge, and attitudes. However, its effect on actual behaviour change is relatively weaker. Although within-group variation is substantial, the significant F-values indicate that between-group differences are statistically meaningful. Overall, media exposure significantly influences both cognitive and attitudinal dimensions (Table 3). It is a key driver in environmental perception formation.

Table 3. **Chi square pearson analysis with age factors**

Age	Age	Media Exposure	Media Influence	Scarcity Awareness	Conservation Knowledge	Environmental Awareness	Conservation Advocacy	Behaviour change
18-24years	Mean	16.04	16.50	10.81	11.04	11.15	3.60	25.16
18-24years	Std. Deviation	4.637	4.682	2.717	3.024	3.024	1.161	9.744
25-34 years	Mean	15.67	16.49	11.18	11.11	11.18	3.75	24.00
25-34 years	Std. Deviation	5.018	4.765	2.996	2.983	2.961	1.223	8.692
35-44 years	Mean	15.57	15.82	10.49	10.93	11.15	3.62	25.12
35-44 years	Std. Deviation	4.450	4.461	2.868	2.652	2.653	1.062	8.839
45-55 years	Mean	17.94	17.40	11.14	11.42	11.64	3.91	29.22
45-55 years	Std. Deviation	4.789	4.730	3.161	3.221	3.320	1.216	8.690
56-65 years	Mean	17.33	17.98	11.31	11.55	11.95	4.12	27.10
56-65 years	Std. Deviation	4.053	3.966	2.414	2.200	1.899	.916	9.512
66-75 years	Mean	15.95	16.75	10.60	10.53	10.63	3.60	28.25
66-75 years	Std. Deviation	3.449	3.848	2.550	2.449	2.579	1.105	9.136
	Mean	16.38	16.72	10.91	11.11	11.29	3.75	26.27
	Chi-Square	4.605	4.531	2.851	2.842	2.857	1.141	9.200
	df Sig.	130.011	117.614	59.074	74.378	83.553	19.713	129.170
		100	100	60	60	60	20	130
		.023*,b,c	.110b,c	.510b,c	.100b,c	.024*,b,c	.476b	.504b,c

The Chi-square analysis reveals that age is statistically significantly associated with Media Exposure (p = .023) and Environmental Awareness (p = .024), as both p-values are below the 0.05 threshold. This indicates that age groups differ in their levels of media exposure and environmental awareness, possibly due to differences in media consumption habits and life experiences. Younger and middle-aged groups may be more exposed to digital and social media, influencing their awareness levels. However, Media Influence (p = .110), Scarcity Awareness (p = .510), Conservation Knowledge (p = .100), Conservation Advocacy (p = .476), and Behaviour Change (p = .504) are not statistically significant. This suggests that age alone does not strongly determine how individuals interpret media messages or translate them into knowledge, advocacy, or behavior (Table 4).

Table 4. **Chi-Square analysis for gender with factors**

Gender	Gender	Media Exposure	Media Influence	Scarcity Awareness	Conservation Knowledge	Environmental Awareness	Conservation Advocacy	Behaviour change
Male	Mean	16.40	16.49	10.83	11.08	11.33	3.72	25.74
Male	Std. Deviation	4.724	4.688	2.890	2.990	2.852	1.141	9.490
Female	Mean	16.36	16.93	10.99	11.13	11.25	3.78	26.74
Female	Std. Deviation	4.509	4.389	2.822	2.712	2.868	1.143	8.932
Total	Mean	16.38	16.72	10.91	11.11	11.29	3.75	26.27
Total	Std. Deviation	4.605	4.531	2.851	2.842	2.857	1.141	9.200
	Chi-Square	40.926	20.011	15.531	10.890	14.658	7.493	23.321
	df	20	20	12	12	12	4	26
	Sig	.004*, b	.457b, c	.214 b, c	.538 b	.261 b	.112 b	.615 b, c

The Chi-square results indicate that gender is statistically significantly associated only with Media Exposure (p = .004), as the p-value is below 0.05. This suggests that males and females differ in their levels or types of media exposure, possibly due to variations in media preferences, accessibility, or usage patterns. However, Media Influence (p = .457), Scarcity Awareness (p = .214), Conservation Knowledge (p = .538), Environmental Awareness (p = .261), Conservation Advocacy (p = .112), and Behaviour Change (p = .615) are not statistically significant. This implies that once exposed to media, both genders respond similarly in terms of understanding, awareness, and behavioral outcomes. The absence of significance indicates that gender does not play a major role in shaping media-influenced environmental attitudes or actions. It also suggests that media messages may be uniformly interpreted across genders.

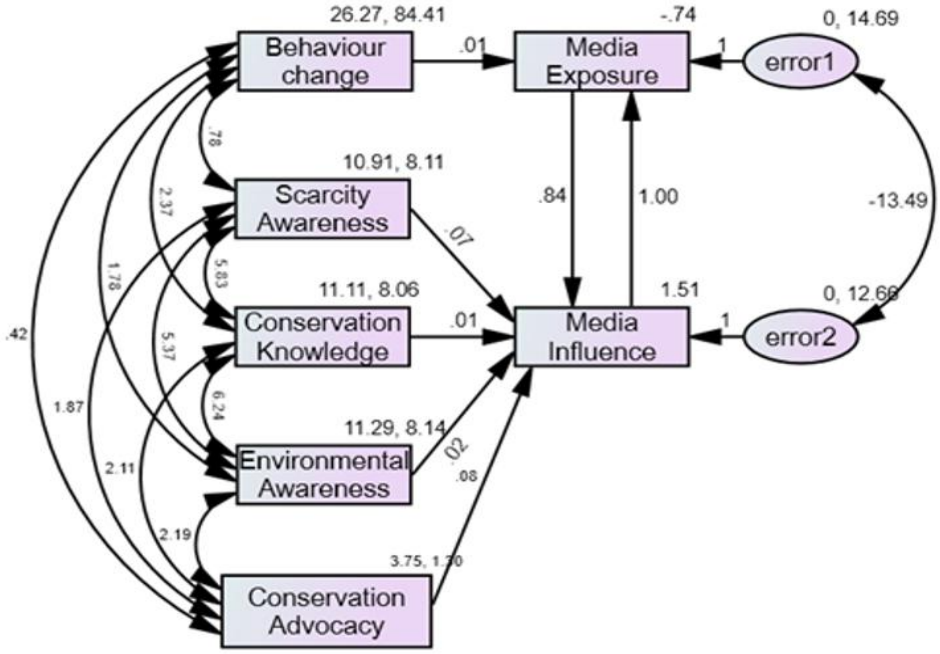
The findings reveal that media coverage has a limited but noticeable influence on behaviour change regarding water conservation. Nearly half of the respondents (49.6%) reported no influence, indicating weak media penetration or message effectiveness. Only 8.1% reported actual behaviour change, suggesting that awareness does not easily translate into action. Similarly, 50.6% took no action after exposure to media content, highlighting a gap between information and implementation. A moderate proportion engaged in small actions like closing taps (13.8%), showing partial behavioural adoption. Regular and major conservation practices remain very low, indicating lack of strong motivation or resources. Social media (16.6%) appears slightly more influential than traditional media, suggesting changing media consumption patterns. However, 48.1% expressed no opinion, reflecting disengagement or indifference toward media messaging. Key barriers include low awareness (15.8%) and lack of motivation (8.6%), which hinder behaviour change. Environmental concern (14.3%) motivates some individuals, but not enough to drive widespread action. Daily and consistent practices are limited, indicating that habits are not firmly established. A significant proportion (49.1%) reported no change in water-use habits despite awareness. Slight and moderate changes exist, but they are not substantial enough to affect the outcome. Cost barriers and practical difficulties may also limit the adoption of advanced conservation practices. Overall, the media creates awareness but fails to strongly influence sustained behavioral transformation. Behaviour change is gradual and requires stronger engagement strategies beyond information dissemination.

Structural Equation Model-SEM

The Structural Equation Model (SEM) demonstrates a well-fitting model with a Chi-square value of 2.647 and a non-significant p-value of .449, indicating good model fit. The low Chi-square relative to degrees of freedom (df = 3) suggests that the proposed model adequately represents the observed data (Figure 1). The model includes 9 variables, with 7 observed and 2 unobserved (error terms), ensuring a balanced structure. Media Exposure and Media Influence are treated as endogenous variables, influenced by multiple exogenous factors. Behaviour change, scarcity awareness, conservation knowledge, environmental awareness, and conservation advocacy act as key predictors in the model. The presence of only 3 degrees of freedom indicates a nearly

saturated model, yet it is still statistically acceptable. The estimated parameters (32) closely match the sample moments (35), supporting model efficiency. Error terms (error1 and error2) account for unexplained variance, improving model accuracy. The results imply that media-related variables are significantly shaped by awareness and behavioural factors. The SEM confirms that the conceptual framework is statistically valid and theoretically meaningful (Table 5).

Figure 1. **Structural equation model-sem**



Maximum Likelihood Estimates

Table 5. **Regression weights: (group number 1 - default model)**

Media exposure	<---	Behaviour change	.013	.023	.568	.570
Media influence	<---	Scarcity awareness	.067	.113	.593	.553
Media influence	<---	Conservation knowledge	.010	.024	.427	.670
Media influence	<---	Environmental awareness	.021	.039	.548	.584
Media influence	<---	Conservation advocacy	.083	.143	.580	.562
Media influence	<---	Media exposure	.843	.237	3.563	.001
Media exposure	<---	Media influence	1.004	.092	10.860	.001

The regression results indicate that most relationships are not statistically significant based on their p-values. Behaviour change → Media Exposure (p = .570) is not significant, suggesting that behavioural outcomes do not directly predict exposure levels. Similarly, Scarcity Awareness (p = .553), Conservation Knowledge (p = .670), Environmental Awareness (p = .584), and Conservation Advocacy (p = .562) show no significant effect on Media Influence. These high p-values (> .05) indicate weak predictive power of awareness and knowledge variables on media influence. This may be due to limited variability, indirect effects, or the presence of mediating variables not captured in the model. In contrast, Media Exposure → Media Influence (p < .001) is highly significant, indicating that increased exposure strongly enhances perceived media influence (Table 6). Likewise, Media Influence → Media Exposure (p < .001) is also significant, suggesting a reciprocal relationship between the two constructs. This bidirectional significance implies a reinforcing cycle in which exposure and influence mutually reinforce one another. The lack of significance in other paths suggests that awareness alone does not directly translate into influence without sufficient exposure. It also indicates that behavioural and cognitive variables may act indirectly rather than directly. These findings emphasize the central role of media exposure compared to other awareness-based factors.

Table 6. **Means: (group number 1 - default model)**

Behaviour change	26.268	.469	56.024	.001
Scarcity awareness	10.914	.145	75.104	.001
Environmental awareness	11.286	.146	77.506	.001
Conservation knowledge	11.106	.145	76.667	.001
Conservation advocacy	3.753	.058	64.567	.001

The mean estimates for all variables are statistically significant, as indicated by p-values less than .001. Behaviour change ($p < .001$) shows a high mean score (26.268), suggesting that respondents exhibit measurable levels of behavioural response. Scarcity awareness ($p < .001$) also demonstrates strong significance, indicating consistent recognition of water scarcity issues among participants. Environmental awareness ($p < .001$) reflects a similarly high and stable level of understanding across the sample. Conservation knowledge ($p < .001$) confirms that respondents possess adequate knowledge regarding water conservation practices. Conservation advocacy ($p < .001$), although lower in mean value (3.753), remains statistically significant, indicating supportive attitudes toward conservation efforts. The very high critical ratios (C.R. values) across variables further confirm the robustness of these estimates. Low standard errors indicate minimal variation and high precision in the estimates. These significant p-values imply that the observed means are not due to random chance. The consistency across all variables suggests strong baseline awareness and attitudes in the population. However, differences in mean values indicate varying levels of intensity across constructs. This pattern reflects that awareness and knowledge are stronger than advocacy and behavioural expression (Table 7).

Table 7. **Covariances: (group number 1 - default model)**

Behaviour change	<-->	Environmental awareness	1.783	1.341	1.330	.184
Scarcity awareness	<-->	Environmental awareness	5.373	.497	10.808	.001
Behaviour change	<-->	Conservation knowledge	2.369	1.336	1.773	.076
Behaviour change	<-->	Scarcity awareness	.784	1.336	.587	.557
Scarcity awareness	<-->	Conservation knowledge	5.827	.509	11.459	.001
Conservation knowledge	<-->	Environmental awareness	6.242	.522	11.962	.001
Behaviour change	<-->	Conservation advocacy	.419	.535	.784	.433
Scarcity awareness	<-->	Conservation advocacy	1.867	.191	9.776	.001
Conservation knowledge	<-->	Conservation advocacy	2.115	.197	10.725	.001
Environmental awareness	<-->	Conservation advocacy	2.187	.200	10.941	.001
Error1	<-->	Error2	-13.490	2.204	-6.121	.001

The covariance results show that several relationships are statistically significant, as indicated by p-values less than .001. Scarcity awareness and environmental awareness ($p < .001$) exhibit a strong positive association, indicating that greater scarcity awareness enhances environmental understanding. Similarly, scarcity awareness and conservation knowledge ($p < .001$) are highly correlated, suggesting that recognizing scarcity enhances conservation knowledge. Conservation knowledge and environmental awareness ($p < .001$) also show a strong relationship, reflecting interconnected cognitive dimensions. Conservation advocacy is significantly associated with scarcity awareness, conservation knowledge, and environmental awareness (all $p < .001$), indicating that these factors strongly drive advocacy. In contrast, behaviour change shows no significant covariance with environmental awareness ($p = .184$), scarcity awareness ($p = .557$), and conservation advocacy ($p = .433$). Behaviour change and conservation knowledge ($p = .076$) is marginal but still not statistically significant (Table 8). These non-significant p-values suggest that behavioural outcomes are not directly aligned with awareness or knowledge variables. This may be due to external barriers such as cost, habit, or lack of motivation. The significant negative covariance between the error terms ($p < .001$) indicates shared unexplained variance among the endogenous variables. High critical ratios for significant paths confirm the strength and reliability of these associations. These findings highlight that cognitive and awareness factors are strongly interrelated, whereas behaviour change operates more independently.

Table 8. **Variances: (group number 1 - default model)**

Behaviour change	84.414	6.092	13.856	.001
Scarcity awareness	8.110	.585	13.856	.001
Conservation knowledge	8.059	.582	13.856	.001
Environmental awareness	8.142	.588	13.856	.001
Conservation advocacy	1.298	.094	13.856	.001
Error1	14.693	1.695	8.670	.001
Error2	12.665	2.568	4.931	.001

The variance estimates for all variables are statistically significant, as indicated by p-values less than .001. Behaviour change ($p < .001$) shows the highest variance (84.414), suggesting considerable variability in respondents' actions. This indicates that behavioural responses differ widely across individuals due to external and personal factors. Scarcity awareness ($p < .001$), conservation knowledge ($p < .001$), and environmental awareness ($p < .001$) show moderate, similar variance, reflecting consistent responses with some variation. These results imply that awareness and knowledge are relatively stable but not uniform across the sample. Conservation advocacy ($p < .001$) has the lowest variance (1.298), indicating more consistency in attitudes toward advocacy. The significant p-values confirm that these variances are meaningful and not due to random error. Low standard errors further support the precision of these estimates. The high critical ratios indicate strong statistical reliability of the variance estimates. Error1 and Error2 ($p < .001$) are also significant, suggesting unexplained variance in the model. This reflects that some influencing factors are not included in the model. The variability in behaviour change compared to other variables suggests that actions are less predictable than awareness. These findings highlight that cognitive variables are more stable, while behaviour is more dynamic and context-dependent (Table 9).

Table 9. **Model fit summary table**

Model Fit Index	Value	Acceptable Threshold	Interpretation	APA Citation
CMIN/DF	0.882	< 3.0	Very good fit	(Carmines & McIver, 1981)
NFI	0.998	≥ .90	Excellent fit	(Bentler & Bonett, 1980)
RFI	0.985	≥ .90	Good fit	(Bollen, 1989)
IFI	1	≥ .90	Perfect fit	(Bollen, 1989)
TLI	1.002	≥ .95	Excellent fit	(Tucker & Lewis, 1973)
CFI	1	≥ .95	Perfect fit	(Hu & Bentler, 1999)
RMSEA	0.001	≤ .06	Excellent fit	(Hu & Bentler, 1999)
PCLOSE	0.762	> .05	Close fit confirmed	(MacCallum et al., 1996)
AIC	66.647	Lower is better	Best model fit	(Akaike, 1987)
ECVI	0.174	Lower is better	High model stability	(Browne & Cudeck, 1993)
Hoelter (.05)	1134	> 200	Strong sample adequacy	(Hoelter, 1983)

The model fit indices indicate an excellent overall fit of the specified SEM model. The CMIN/DF value (0.882) is well below the threshold of 3.0, suggesting minimal discrepancy between observed and model-implied data [21]. The NFI (0.998) and RFI (0.985) exceed recommended levels, indicating strong comparative model performance. IFI (1.000), TLI (1.002), and CFI (1.000) indicate a near-perfect fit, indicating that the model explains the covariance structure very effectively. RMSEA (0.001) indicates no approximation error, reflecting an ideal model fit. The PCLOSE value (0.762) further confirms that the model achieves a close fit in the population. AIC (66.647), which is lower than that of the alternative models, supports selecting this model as the best-fitting one. ECVI (0.174) suggests strong potential for model replication in other samples. The Hoelter index (1134) indicates that the sample size is more than adequate for model stability. These fit indices collectively confirm that the model is statistically robust and well-specified. The consistency across multiple indices reduces the likelihood of model misspecification. The results provide strong evidence that the hypothesized relationships align well with the observed data.

DISCUSSION

The present study employed multiple statistical techniques, including reliability analysis, ANOVA, Chi-square, regression, and Structural Equation Modeling (SEM), to examine the influence of media exposure on water

conservation awareness and behaviour. The reliability test yielded a Cronbach's alpha of 0.851, indicating strong internal consistency among the 31 items and supporting the measurement scale's dependability [18]. This ensures that subsequent analyses are based on a stable and coherent dataset. The ANOVA results revealed that media exposure significantly influences media-related constructs such as media influence, scarcity awareness, conservation knowledge, environmental awareness, conservation advocacy, and behaviour change ($p < .05$). High F-values for media influence and awareness variables indicate that exposure plays a critical role in shaping cognitive and perceptual outcomes [13]. However, the relatively lower F-value for behaviour change suggests that while awareness is affected, translating it into action remains limited.

Chi-square analysis showed partial associations between demographic variables and media constructs. Age was significantly associated with media exposure and environmental awareness ($p < .05$), indicating generational differences in media consumption and environmental perception (Field, 2013). Gender showed significance only with media exposure, suggesting differences in access or engagement with media, while other variables remained non-significant. However, low expected cell counts warrant caution in interpretation, as they may affect the validity of the results.

The regression analysis further highlighted that most awareness-based variables (scarcity awareness, conservation knowledge, environmental awareness, and conservation advocacy) did not significantly predict media influence ($p > .05$). In contrast, media exposure showed a highly significant effect on media influence ($p < .001$), and a reciprocal relationship was observed between media exposure and media influence. This suggests that exposure is a central driver, reinforcing its importance in shaping perceptions (Bryne, 2010).

SEM results confirmed that the proposed model has an excellent fit, as indicated by fit indices such as CFI (1.000), RMSEA (0.000), and CMIN/DF (0.882), all within recommended thresholds [15]. The non-significant Chi-square value ($p = .449$) further supports model adequacy. Covariance analysis revealed strong interrelationships among awareness, knowledge, and advocacy variables ($p < .001$), indicating that cognitive factors are closely linked. However, behaviour change showed weak and non-significant associations with these variables, suggesting that behavioural outcomes are influenced by additional external factors. Variance estimates indicated significant variability across all constructs, with behaviour change showing the highest variation, reflecting inconsistency in action among respondents. In contrast, awareness and knowledge variables were more stable, suggesting that information dissemination is effective, but behavioural adoption is uneven. Mean analysis also confirmed high levels of awareness and knowledge but relatively lower advocacy and behavioural engagement.

Findings from open-ended responses further support this pattern: a large proportion of respondents reported taking no action despite exposure to media. Barriers such as low motivation, cost constraints, and habitual practices limit behavioural transformation. Although the media contributes to awareness, it is insufficient to drive sustained action without supportive environmental and structural factors.

The study demonstrates that media exposure significantly enhances awareness and knowledge regarding water conservation but has limited direct impact on behaviour change. The integration of SEM and other statistical analyses provides strong evidence that cognitive variables are interconnected, while behavioural outcomes remain complex and multifaceted. These findings align with existing literature emphasizing that awareness alone does not guarantee action, highlighting the need for more engaging, practical, and policy-driven interventions to achieve meaningful behavioural change (Ajzen, 1991; Bandura, 2001).

Findings

The analysis demonstrates that the study variables are highly reliable, with a Cronbach's Alpha of 0.851 confirming strong internal consistency and suitability for further analysis. The demographic profile reflects a balanced distribution across age groups, with a slight predominance of female respondents and a largely well-educated sample. Statistical results highlight the significant role of media exposure in shaping awareness, knowledge, and advocacy related to water conservation, underscoring its influence on environmental perceptions. However, despite this strong influence on cognitive aspects, behavioural change remains comparatively weak, indicating a clear gap between awareness and action.

Further analysis shows that demographic factors such as age and gender have limited influence, with significance observed primarily for media exposure. Regression findings establish media exposure as a strong predictor of media influence, with evidence of a reciprocal relationship between the two. In contrast, awareness-related variables do not significantly predict media influence, suggesting that exposure plays a more critical role than knowledge alone. The SEM results confirm excellent model fit and validate the theoretical framework, while covariance analysis indicates strong interconnections among awareness, knowledge, and advocacy. Nevertheless, behavioural change remains weakly associated with these factors. Insights from open-ended responses further reveal that many respondents do not translate awareness into action, with barriers such as low

motivation, cost constraints, and habitual practices limiting effective behavioural transformation.

CONCLUSION

The study provides a clear understanding of public awareness and media influence on water conservation practices among residents of Chennai. Findings indicate that awareness levels are relatively high, with respondents showing good knowledge of water scarcity and environmental issues. However, this awareness does not consistently lead to actual behavioural change, revealing a persistent gap between knowledge and practice. The analysis confirms that media exposure plays a significant role in shaping awareness, knowledge, and advocacy, though its direct impact on behaviour remains limited. Variations in awareness across different areas suggest that access to media, infrastructure, and local conditions influence public understanding, highlighting the need for context-specific communication strategies. Demographic factors such as age and gender show only limited influence, indicating that media messages reach broadly but do not uniformly translate into action. Overall, while the media is effective in raising awareness, it alone is insufficient to drive sustained behavioural change. More targeted interventions, stronger engagement strategies, and supportive policy measures are essential to turn awareness into consistent water-conservation practices.

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