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# Adoption Intention of Technology-Based Water Generation and Management Through W-TAM

**Rajashree Jain[1†], Sarika Sharma[1], Deepthi Setlur[2], Aditya Bajaj[1] and Dhwani Parekh[1]**

[1]Symbiosis Institute of Computer Studies and Research, Symbiosis International University, Pune, India
[2]Fruition Technology Labs and AquaVapor, Cypress, Texas, United States
†Corresponding author: Rajashree Jain; rajashreejain@gmail.com

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## ABSTRACT

Increasing concerns related to climate change and extensive use of water resources have depleted the available water for use. For water as an essential requirement for humans to carry onto their day-to-day chores, access and availability of water becomes the highest priority. Technology-based solutions support water generation, filtration, quality testing, water distribution, and many other areas. The present paper dwells on the user acceptance of these technologies. A conceptual model was developed through a literature review and named as Water-Technology Acceptance Model (W-TAM). The data was collected through a self-designed survey instrument to empirically test the proposed model. Analysis of this data was done with confirmatory factor analysis and structural equation modeling. It was observed that the actual use of these technologies depends on the ease of use and usefulness. Attitude to use them also matters. Although perceived risks and affordability did affect the use of W-TAM, trust, and regulatory aspects did not confirm their role in the adaptation of W-TAM. These findings will provide meaningful insights to the stakeholders and will help them in the practical implementation of these water-based technologies. This may also help service providers in the formulation of policies for technology-based water generation.

## INTRODUCTION

The widespread adoption and use of technology have become an integral part of modern life, with individuals using technology for various tasks and activities daily. The evolution of smartphones and mobile applications seamlessly integrates into our daily lives (Lee et al. 2014). Acceptance of the internet and the rise of bottled water consumption are some examples of such transformations. These changes have had far-reaching social, economic, and environmental implications. As per the World Resources Institute, more and more countries are now entering in water stress ranking, which is a matter of concern (Kuzma et al. 2023). Technological solutions for alternate sources of water generation are the need of the hour to tackle this crucial situation. Atmospheric water generation (AWG) seems to be a sustainable solution, which is researched, and advancements that happened in the last decade are quite promising (Raveesh et al. 2021, Gido et al. 2016).

### Water Resource and Technologies: A Background

Water, a vital natural resource, holds cultural and ecological significance, paralleling the impact of technology on communication. Being a scarce resource, it also plays a critical role in sustaining life and supporting various ecosystems. Concerns about water pollution, scarcity, and excessive consumption highlight the need for responsible water usage. The surge in bottled water consumption raises concerns about convenience and environmental impact, with manufacturing and disposal contributing to resource depletion, greenhouse gas emissions, and pollution. Awareness drives the search for alternatives like reusable bottles and improved water infrastructure to address convenience and environmental concerns (Gleick & Cooley 2009).

Water scarcity is not only a local issue; it is one of the Sustainable Development Goals (SDGs) recognized by the United Nations. It highlights the importance of equitable access to clean water and sanitation services, protection of water resources, and the adoption of sustainable practices (Bhaduri, 2016). To ensure a sustainable future, it is crucial to develop and implement innovative and sustainable technologies for water generation, management, and conservation. Investing in technologies such as atmospheric water generators can help alleviate the pressures of water scarcity and ensure a more secure water future for all (Almusaied & Asiabanpour 2017).

In addition to the importance of sustainable technology for water sustainability, it is crucial to consider the acceptance and adoption of these technologies. Recognizing that the implementation of technology related to such a vital resource as water can be challenging for people, the Technological Acceptance Model (TAM) comes into play. The present paper dwells on exploring the TAM and especially on the acceptance of technology-based water sources other than natural resources. We present an incremental model based on the traditional TAM proposed by Davis (1989) and referred to here as W-TAM, a Water Technology Acceptance Model.

### Need of the Study and Research Questions

A recent report from the UN Water conference held in March 2023, states the surge in water supply demand by 40% by 2030. The report also raises concerns and urges an overhaul of wasteful water practices around the world. On the other hand, ongoing efforts are also seen in mitigating continued water stress. Literature shares several examples of deep penetration of water-based technologies. Digitalization of water supply systems aligning with Water 4.0 models (Adedeji et al. 2022), Water generation (Raveesh et al. 2021), to user acceptance of water treatment technologies (Contzen et al. 2023) are available in the literature. However, most of these user acceptance models were studied from clusters like employees of municipalities for technology adoption or use of smart devices for water management and a few are available on water treatment. Researchers have considered the use of ICT and IOT-based technology for water management and water services department employees (Morienyane et al. 2019). TAM was extended for smart meter usage along with a few moderating variables like personal environment concerns and innovation (Madias et al. 2023). It is also important to note the end-user acceptance of these technologies. However, the impact of trust in water technologies and regulatory policies from the public was not found in the study. A study in particular to show user acceptance of technologies used for water or W-TAM was not available. Hence, an extended TAM for water technologies was felt. The present paper proposes W-TAM with extended parameters. With this backdrop, the study attempts to seek answers to these research questions:

Research Question 1: Whether technology for water generation, water treatment, and water management are acceptable to users?

Research Question 2: What factors can influence the acceptance of water technologies in W-TAM?

## LITERATURE REVIEW

As part of this study, a critical literature review was conducted about water, technologies used for water quality and generation and their acceptance-related contexts. Therefore, the technology acceptance model was included in the context of water technologies.

### Water Generation Technologies

AWGs are devices that extract water vapor from the air, condense it into liquid water, and have been designed as an innovative solution for regions with medium to high humidity (Peters et al. 2013). Shafeian et al. (2022), in their study, examined the environmental claims of Air Water Generators (AWGs), and their acceptance by the selected individuals or communities. Jarimi et al. (2020) presented a technology review and the merits of fog and dew-based AWGs.

Pontious et al. (2016) provided two sustainable engineering designs adhering to minimum energy consumption and cost compared to existing AWGs in the market. Tripathi et al. (2016) designed and presented an AWG that can be powered either through a bicycle-gear arrangement or by utilizing renewable energy sources like solar or wind power. By implementing this solution, the project aimed to provide safe and clean drinking water to the affected regions. Another part of the study was the acceptance of such water generators by the users and the study on the market penetration.

In another study, Das (2018) assessed AWGs for rural and remote India. The study builds the capacity towards the “Har Ghar Lal” initiative of the Government of India. The concern for the use of AWGs remains about the cost. Hybrid technologies and frugal engineering with renewable energy sources may be considered in the future for the mass reach of AWGs. In another context from Jordan, the study focused on the benefits of recovering water generated from air conditioners. The authors examined the quality of such condensed water and the social implications and acceptance of reusing condensed water (Shourideh et al. 2018, Matarneh et al. 2023).

### Water Technology Acceptance Model (W-TAM)

The Technology Acceptance Model (also known as TAM) proposed by Davis (1989) is a widely used theoretical model that explains how individuals come to accept and use technology and identifies perceived usefulness and ease of use as key factors that influence the decision to use technology. An extended model was also proposed later by Venkatesh & Davis (2000). It suggests that users' intention to use technology is influenced by perceived usefulness (how it enhances performance) and perceived ease of use (how user-friendly it is). These factors influence users' attitudes toward technology usage, ultimately affecting their behavioral intention. According to Adams et al. (1992), the decision to use technology is influenced by two main factors, which are 'Perceived usefulness (PU)' and 'Perceived Ease of Use (PEU)'.

### Perceived Usefulness (PU)

It represents users' perspective towards a technology from a benefit point of view. In case we believe that the technology is useful for completing our routine tasks and helping us improve our efficiency it is likely that we perceive it as useful.  It may be subjective for individuals and vary from person to person.

### Perceived Ease of Use (PEU)

Apart from perceived usefulness, perceived ease of use will also play an important role in the acceptance of technology. If a person finds it easy to use with minimum effort to understand for operating a technology, it is more likely that the technology can be used actually.

On the other hand, if a technology appears complex, cumbersome, or requires extensive training, it may be perceived as difficult to use, which can hinder its adoption.

Further to this model, there were several studies conducted, which used the original TAM or the TAM versions. Lee et al. (2003) in their study examined the TAM, especially the uses of accepting technology for Information Systems (IS). Some researchers tested the basic TAM model and some additional significant for usage in the information technology domain (Legris et al. 2003, Davis 1993, Bajaj et al. 1998). Apart from the PU and PEU variables, more behavioral variables were added to the model, like attitude towards using and actual usage behavior and more. Turner et al. (2010) examine the evidence regarding the Technology Acceptance Model (TAM) and its ability to predict actual usage using subjective and objective measures.

Sharp (2007), in his review article, presented several factors influencing individuals' acceptance or rejection of specific technologies, considering the wide range of technologies being implemented. The paper highlighted that the strength of TAM lies in its flexibility and applicability, enabling in-depth analysis and understanding of diverse applied technologies. A meta-analysis of the Technology Acceptance Model (TAM) was presented and concluded that the results obtained from TAM are highly reliable across various contexts. According to King (2006), the analysis highlighted the existence of robust models for applicability.

In the present study, we have used a two-way strategy to understand the Technology Acceptance Model (TAM) and secondly its extension to water-based technologies. It considers the factors from the existing model and is customized for water-related technological innovations.

### Perceived Usefulness of Water-Based Technology (PUWT)

It measured the perceptions of users on the extent to which they find water-based technology beneficial to their daily chores. It also examines whether the existing water-based challenges were addressed. A higher PUWT increases the likelihood of technology adoption. This factor also evaluates the level of awareness and knowledge individuals have about the existence and functionalities of water-based technologies. Effective communication and promotion of the technology's benefits can significantly influence individuals' awareness and increase their interest in adopting the technology (Contzen et al. 2023). The following hypothesis is posited:

*H1: Perceived Usefulness of Water-Based Technology significantly affects the attitude to the use of water-based technology.*

### Perceived Ease of Use of Water-Based Technology (PEUWT)

PEUWT measures the degree to which individuals believe that using water-based technology is simple, effortless, and requires minimal effort to operate. The technology was accepted in the past based on the perceived ease of use of several technology penetrations like online ticketing, e-learning services, and IOT-based water meters by several researchers (Renny et al. 2013, Lee et al. 2013, Willis et al. 2010).  PEUWT affects the intentions and may influence the users towards a specific technology. An intuitive and user-friendly interface, along with straightforward instructions, can enhance the perceived ease of use, making the technology more appealing to potential users.  Therefore, we considered the Hypothesis as follows:

*H2: Perceived Ease of Use of Water-Based Technology significantly affects the attitude toward to use of water-based technology.*

### Trust in Water-based Technology (TWBT)

Trust plays a crucial role in technology adoption. It has been seen as an important factor in influencing online behaviors, especially towards e-commerce (Lee et al. 2013, Pavlou 2003). TWBT assesses the level of confidence individuals have in the water-based technology's reliability, security, and performance. Strong trust in the technology fosters a positive attitude toward its adoption (Wu et al. 2000).

*H3: Trust in Water-Based Technology significantly affects the attitude to use water-based technology.*

### Regulatory and Policy Support (RPS)

Wolsink (2010) discussed a comparative analysis of acceptance of technology based on the policies and regulatory framework. The author presented the case based on several dimensions of technology acceptance, including a policy point of view. These are socio-political, community, and market acceptance of public and private infrastructure in the three case study areas considered. The three areas considered for this acceptance framework were renewable energy, space-water management, and waste management. RPS assesses the impact of government policies, regulations, and incentives that either facilitate or hinder the adoption of water-based technology. Supportive policies can encourage wider adoption. The present study dwells on testing them as:

*H4: Regulatory and Policy Support (RPS) significantly affects the attitude to use water-based technology.*

### Attitude to Use Water-based Technologies

From the original TAM model, this can be adopted that the attitude to use water-based technology impacts the actual use of water-based technology and thus hypothesized as:

*H5: Attitude to use water-based technology significantly affects the actual use of water-based technology.*

### Other Moderators

There are two more factors identified that can moderate between the attitude to use and the actual use of the water-based technology. These are:

a) **Perceived Cost and Affordability (PCA):** PCA evaluates the financial implications associated with adopting the water-based technology. This includes the initial investment, maintenance costs, and the perceived value of the technology to its cost.

   *H6: The Perceived Cost and Affordability play a moderating role between attitude to use water-based technology and attitude to use water-based technology*

b) **Perceived Risks (PR):** PR explores individuals' perceptions of potential risks associated with using

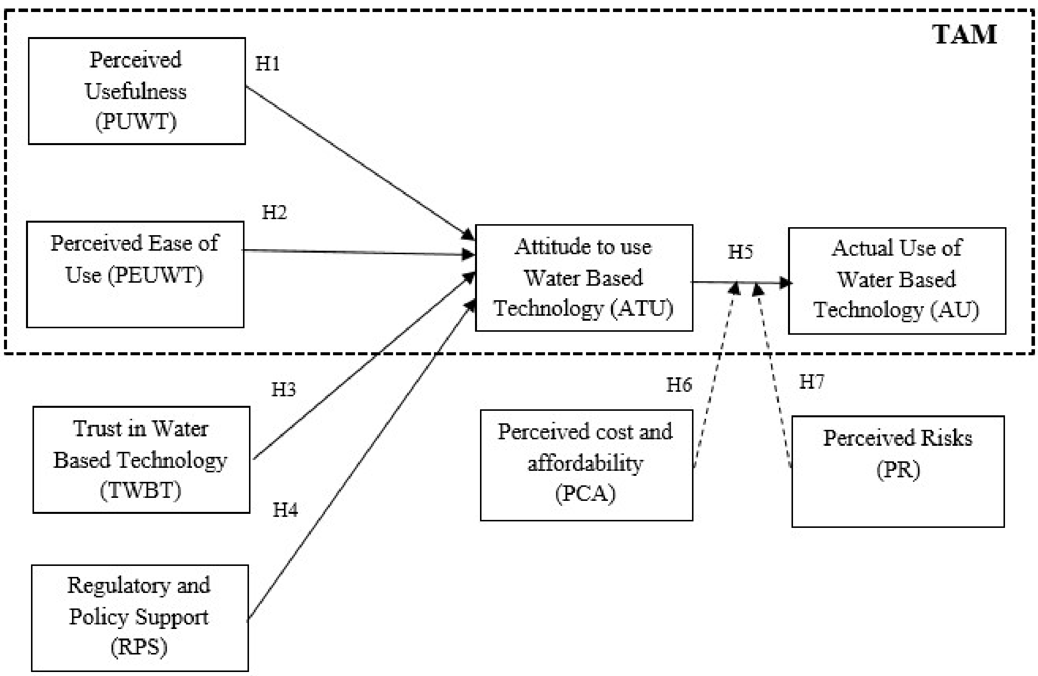


Fig. 1: Conceptual hypothesized model.

water-based technology, such as technical failures, data security issues, or adverse environmental effects. Lower perceived risks positively affect technology adoption.

*H7: The Perceived Risks play a moderating role between attitude to use water-based technology and attitude to use water-based technology*

Based on the above discussion, the hypothesized theoretical framework is exhibited in Fig. 1. The present paper delves into the user acceptance perspective on AWGs. The present work presents a twofold strategy adopted in conducting the present research, the first one being TAM and the second one is on a very futuristic water-based Technology for which we are referring as the Water-Based Technology Acceptance Model (W-TAM). The proposed W-TAM model provides a comprehensive framework to analyze the various factors influencing the acceptance and adoption of water-based technologies. The details of the methodology used are detailed in the next section.

## MATERIALS AND METHODS

To empirically test the model proposed (Fig. 1), a survey was conducted and data was collected. The study is based on the perception and adoption of the use of technology-based water generation, therefore, the respondents were people who are using or intending to use it from various cities of India. The study focused on six major cities in India, namely Pune, Delhi, Ahmedabad, Chennai, and Bengaluru. These cities were selected due to their varied demographics, geographical locations, and differing levels of exposure to water-related challenges, making them suitable representatives of the larger Indian urban population (the data collection period is November 2023 to February 2024). A convenience sampling method was adopted for data collection. An electronic form was designed and sent to the respondents through electronic and social media channels. The 223 responses were collected and considered for data analysis (see demographics Table 1).

Table 1: Demographics (N =223).

| Factor | Category | Count |
|---|---|---|
| Age (in years) | 10-30 | 74 |
| | 31-50 | 99 |
| | 51-70 | 44 |
| | >70 | 6 |
| Gender | Female | 129 |
| | Male | 92 |
| | Prefer not to say | 2 |
| Place of Residence | District | 137 |
| | Town | 78 |
| | Village | 8 |
| Number of members in the Family | Four | 135 |
| | Five | 47 |
| | Six | 23 |
| | More than six | 18 |
| Type of House | Gated township | 22 |
| | Independent home | 107 |
| | Multistory apartment | 94 |
| Occupation | Employed | 127 |
| | Housemaker | 26 |
| | Student | 39 |
| | Other | 31 |
| Annual Income (INR) | < 5 lacs | 88 |
| | < 7 lacs | 25 |
| | < 10 lacs | 39 |
| | > 10 lacs | 71 |
| Water Purifier Installed at home | Yes | 202 |
| | No | 21 |
| Type of water Purifier used | Use of RO (reverse osmosis) based filter | 116 |
| | Use of Sedimentary Filtration | 47 |
| | Use of UV Filtering | 34 |
| | Don't Know | 5 |
| | Not Applicable | 21 |
| **Total** | | 223 |

### Survey Instrument

A questionnaire was designed to collect data through the survey method. The Likert's five-point agreement scale (5: Strongly Agree to 1: Strongly disagree) was included. It was administered using a Google Form to gather quantitative data from a wider audience of stakeholders. The research employed a mixed-methods approach to investigate the technological acceptance of Atmospheric Water Generators (AWGs). The study utilized personal interviews conducted as telephonic conversations and online surveys distributed via a Google Form. The questionnaires for each criterion group were carefully designed to elicit information about the factors influencing technological acceptance. Questions focused on participants' knowledge of AWGs, perceived benefits and drawbacks, concerns regarding reliability and efficiency, and willingness to adopt the technology. The questionnaires also explored participants' attitudes towards sustainable practices and environmental consciousness. The surveys were tailored to each criterion group, addressing specific concerns and interests related to AWGs. The reliability of the scales used was tested with Cronbach's Alpha (obtained value is 0.923), which is more than 0.8 (Fornell & Larcker 1981), and hence reliability is good for the survey instrument.

## RESULTS AND DISCUSSION

To address the content validity, a rigorous literature review was conducted for the model development. In addition, telephonic interviews were conducted with key stakeholders, including industry experts, retailers, suppliers, and decision-makers, to gain in-depth insights into their perceptions, experiences, and attitudes toward AWGs. Structural equation modeling (SEM) is a widely adopted statistical method that leads to the development of path models using regression analyses involving independent and dependent variables (Saris & Stronkhorst 1984). Software SPSS 16.0 and AMOS 22.0 were used for data analysis. In the first phase, a confirmatory factor analysis (CFA) was performed for model fitness and validity and in the second phase, SEM was performed. The model fitness indices suggested by Hair et al. (2010) are adopted in this study. We obtained values for Chi-square/degree of freedom (CMIN/DF) as 1.249, which is less than 3, Comparative fit index (CFI) as 0.965, which is > 0.9, and Tucker Lewis index (TLI) as 0.958 which is > 0.9, for the goodness of fit. The root mean square error of approximation (RMSEA) value was obtained as 0.05, which is less than 0.1 for the badness of fit. As all the values are in the suggested range, therefore, it can be analyzed that the model is fit for the application of SEM.

Factor loadings obtained from Confirmatory factor analysis were used to address validity concerns, which are presented in (Fig. 2, Table 2, and Table 3). Convergent Validity is measured with a) Composite Reliability (CR), whose values should be more than 0.7 (Jöreskog 1971), b) Average variance explained (AVE): whose values should

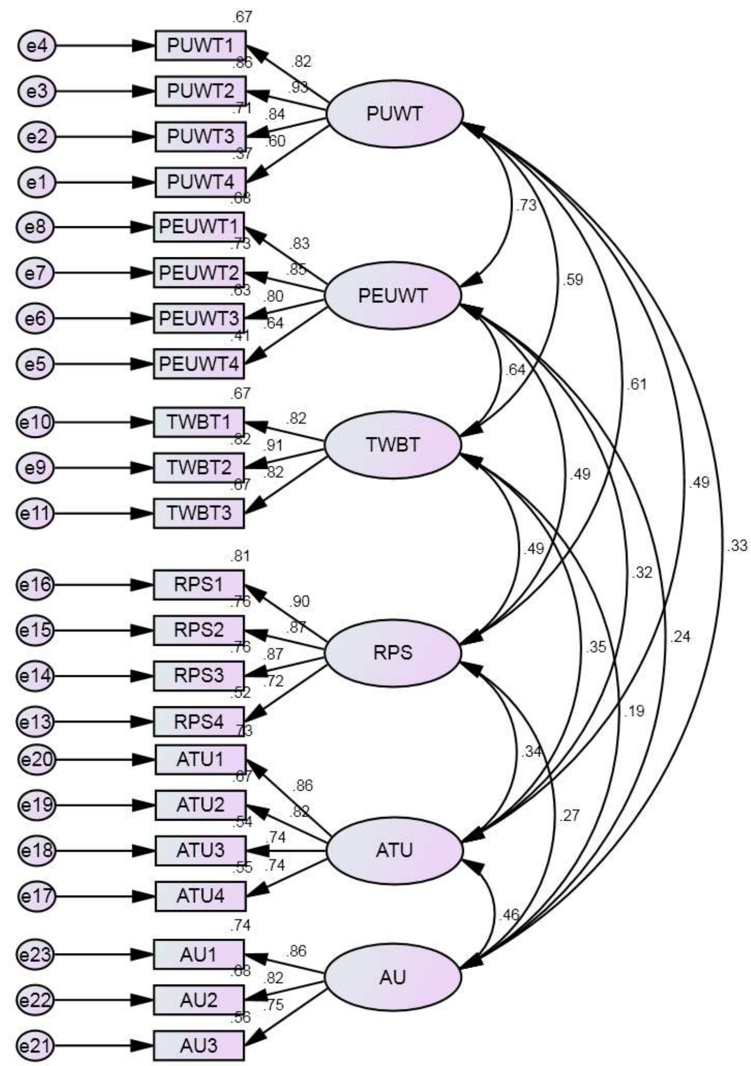


Fig. 2: Confirmatory Factor Analysis (CFA).

Table 2: Item loadings, composite reliability, and average variance explained.

| Construct | Items | IL | CR | AVE |
|---|---|---|---|---|
| Perceived Usefulness of Water Technologies (PUWT) | PUWT1 | 0.82 | 0.879 | 0.651 |
| | PUWT 2 | 0.93 | | |
| | PUWT 3 | 0.84 | | |
| | PUWT 4 | 0.60 | | |
| Perceived Ease of Use of Water Technologies (PEUWT) | PEUWT1 | 0.83 | 0.863 | 0.615 |
| | PEUWT2 | 0.85 | | |
| | PEUWT 3 | 0.80 | | |
| | PEUWT4 | 0.64 | | |
| Trust in Water Based Technology (TWBT) | TWBT1 | 0.82 | 0.887 | 0.724 |
| | TWBT2 | 0.91 | | |
| | TWBT3 | 0.82 | | |
| Regulatory and Policy Support (RPS) | RPS1 | 0.90 | 0.907 | 0.711 |
| | RPS2 | 0.87 | | |
| | RPS3 | 0.87 | | |
| | RPS4 | 0.72 | | |
| Attitude to use Water Based Technology (ATU) | ATU1 | 0.86 | 0.870 | 0.627 |
| | ATU2 | 0.82 | | |
| | ATU3 | 0.74 | | |
| | ATU4 | 0.74 | | |
| Actual Use of Water-Based Technology (AU) | AU1 | 0.86 | 0.852 | 0.658 |
| | AU2 | 0.82 | | |
| | AU3 | 0.75 | | |

be above 0.5 (Hair et al. 2010), and c) CR should be more than AVE. These three conditions/validity are achieved for all the constructs. For the discriminant Validity, AVE should be greater than MSV (Maximum shared variance), which is also achieved. After all the validity addressed in the proposed model, analysis using SEM was conducted and presented in the next sub-section.

## Path Analysis of the Proposed Model

Structural Equation Modeling (SEM) was carried out for the proposed model, which, according to Hair et al. (2010) (Fig. 3). There were five hypotheses (H1 to H5) proposed in the study. The hypotheses testing is presented in Table 4.

The hypotheses were tested through the above SEM, and results can be interpreted for each hypothesis. The first hypothesis was about the impact of user satisfaction on attitude. From the above table (Table 4), it can be interpreted that the perceived usability of water technologies and perceived ease of use of water technologies positively and significantly affect a person's attitude to using water technologies. Further, it can be stated from the table that attitude affects the actual use of water technologies. Thus, hypotheses H1, H2, and H5 are accepted. hypotheses H3 and H4 are rejected in this study, which means there was no significant impact of trust in water-based technology and regulatory and policy support on attitude to use water-based technology.

## The Mediation Impact

The model has two mediating variables whose effect is to be analyzed between the variable's attitude to use water-based technologies and actual use. These are perceived cost and affordability and perceived risks. Respondents were asked whether they find water-based technologies affordable and cost-effective. Also in another question, respondents were asked whether they feel any risks are associated with water-based technologies. For both questions, the responses are recorded as 'yes' or 'no', considering them categorical variables. The data set was split based on the variables 'perceived cost and affordability' and then for 'perceived risks'. The mediation impact was tested through the Z test, which was carried out through software 16.0. If the obtained Z value is <1.96, The null hypothesis is to be accepted, which means that there is no significant difference exists, and there is no mediating role of variables 'perceived cost and affordability' and 'perceived risks'. For hypothesis, H6 and H7 results are presented in Table 5.

The mediating role of perceived cost and affordability (yes or no) can be expressed as:

$$\text{Actual Use} = a + b_{(Yes)}\,(ATU)$$

Table 3: Correlation matrix.

| | CR | AVE | MSV | MaxR(H) | TWBT | PUWT | PEUWT | RPS | ATU | AU |
|---|---|---|---|---|---|---|---|---|---|---|
| TWBT | 0.884 | 0.718 | 0.410 | 0.895 | 0.847 | | | | | |
| PUWT | 0.880 | 0.652 | 0.534 | 0.920 | 0.587 | 0.807 | | | | |
| PEUWT | 0.862 | 0.613 | 0.534 | 0.878 | 0.640 | 0.731 | 0.783 | | | |
| RPS | 0.907 | 0.712 | 0.370 | 0.921 | 0.489 | 0.608 | 0.491 | 0.844 | | |
| ATU | 0.870 | 0.626 | 0.243 | 0.878 | 0.347 | 0.493 | 0.320 | 0.344 | 0.791 | |
| AU | 0.853 | 0.659 | 0.209 | 0.861 | 0.192 | 0.327 | 0.238 | 0.267 | 0.457 | 0.812 |

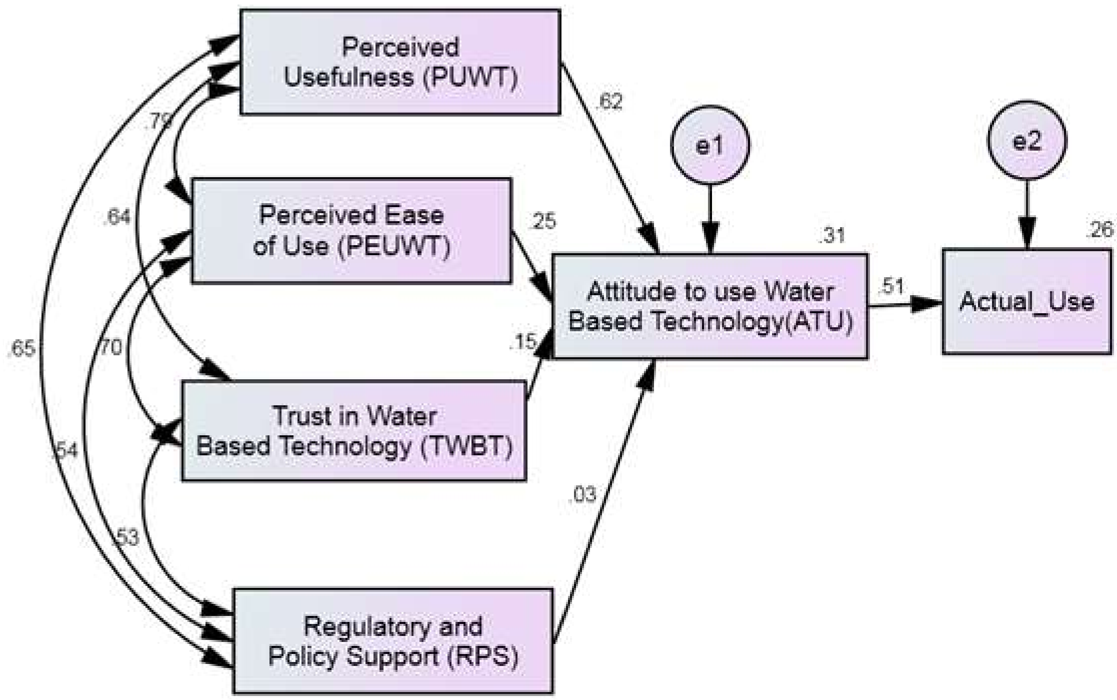


Fig. 3: Path analysis using SEM.

Table 4: Key findings of SEM and Hypotheses testing.

| Hypothesis | Path Coefficient (β) | p Values | Significance (p<0.05) | Finding and Hypothesis (Accepted/rejected) |
|---|---|---|---|---|
| H1: PUWT -> ATU | 0.62 | 0.000 | Yes | Accepted |
| H2: PEUWT -> ATU | 0.25 | 0.040 | Yes | Accepted |
| H3: TWBT -> ATU | 0.15 | 0.216 | No | Rejected |
| H4: RPS -> ATU | 0.03 | 0.775 | No | Rejected |
| H5: ATU -> AU | 0.51 | 0.000 | Yes | Accepted |

Table 5: Mediating role of variables.

| Perceived cost and affordability (PCA)<br>Yes: 49<br>No: 174 | B (PCA-Yes) | B (PCA-No) | Standard error (PCA-Yes) | Standard error (PCA-No) | Z value |
|---|---|---|---|---|---|
| Between attitude to use water-based technologies and actual use | 0.018 | 0.641 | 0.292 | 0.102 | 2.014 |
| Perceived risks (PR)<br>Yes: 128<br>No: 95 | B (PR-Yes) | B (PR -No) | Standard error (PR -Yes) | The standard error (PR -No) | Z value |
| Between attitude to use water-based technologies and actual use | .489 | .268 | .125 | .279 | 0.722 |

$$\text{Actual Use} = a + b_{(No)} (\text{ATU})$$

Where *a* is the intercept and *b* is the regression coefficient of the independent variable, which is ‘attitude to use water-based technologies’.

From Table 5, it can be interpreted that a) the Z value for the mediating variable ‘Perceived cost and affordability’ is 2.014, which is greater than 1.96. Therefore, there exists a difference between the values and it can be said that ‘Perceived cost and affordability’ mediates and impacts between attitude to use water-based technologies and actual use. However, for the mediating variable ‘Perceived Risks’, there is no mediating impact as the Z value is 0.722, which is less than 1.96.

## CONCLUSIONS

This study proposed a concept through an extensive literature review. Additional factors were identified and were used to extend the existing TAM (Davis 1993) in the context of water technologies. The analysis of the present study adopted for W-TAM shows that both perceived Usefulness of Water Technologies (PUWT) and Perceived ease of Use (PEUWT) affect user's Attitudes to Use Water Based Technology. (ATU). This is accepted by several past research findings (Davis 1993, 1989, Lule 2012). These have positively impacted the Actual Use of Water Technologies. Whereas it was observed that the perceived cost and affordability matter when it comes to the actual use of W-TAM on the other hand, responses stated that the perceived risk has no moderating effect on the actual use. Trust is a belief and has always been uncertain from users' point of view. In e-commerce, retail, banking, and finance sectors, this has been a major influencer in accepting the changes and technological developments. However, for water is an essential requirement for humans to carry onto their day-to-day chores, access and availability of water becomes the highest priority than the policy and regulatory framework and trust. Accordingly, the study rejected the hypothesis of Regulatory and Policy Support (RPS). Wolsingk (2010) argued that in the context of renewable water and waste energies, infrastructure regulations and uniform and standardized solutions seldom lead to success. Diversity and local management is the key. Regulations are usually implemented from the point of view of vendors and service providers. In this study the perspective of the user is considered, hence the regulatory policy support may not be an important factor for users to adopt water-based technology. Similarly, Trust in Water Based Technology (TWBT) may not be a sufficient factor to adopt water-based technologies there may be other significant factors to adopt the same. Affordability is another imperative dimension of the adoption of any technology and here, it is also identified as one of the mediating factors. Users find no risk in the adoption of water technologies as per the data analysis in the previous section.

Theoretical Implications: The study adds to the literature body of important and emerging fields of environment and water-based technologies. Through the relevant studies, a theoretical conceptual model was proposed and was tested empirically. The quantitative approach used in this study may be the basis of further investigation in this field.

Practical Implications: This relatively new field of water technologies was studied from the user's perspective and the factors that may affect their decision to use water-based technologies. The quantitative nature of this study provides meaningful insights into user acceptance. The findings may help stakeholders formulate their policies, and cost-related aspects can be taken care of.

### Limitations and Future Scope

The present study was conducted based on convenience sampling and has a scope of testing based on stratified, much wider, and larger samples. There is also scope to extend the study for testing it among communities or clusters like among the residential community, the business community and the policymakers at large. The present model, shown in Fig. 1, is individual, and the findings are for individual users.

As an extension of the study, it may be considered for testing the model in a single article but for distinct technologies used: water generation, water processing, water Filtering, water management, and, in general, "Smart Water Technologies".

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