



# Response to Water Scarcity: Gender Analysis of the Motivation Factors Toward Water Conservation Behavior in the Workplace

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Provision and availability of water continue to be a major socio-economic challenge in many countries. The problem is prevalent particularly in arid and semi-arid regions which are affected by droughts and wide climate variability, combined with high population growth and economic development. Shortages and compromised water availability are causes of concern to food security (agricultural sector), performance of businesses, and economic growth among others. The study adopted a quantitative research approach and was underpinned by a positivist research paradigm. Data were collected from 72 managers at North West University—Mahikeng (NWU-Mahikeng), South Africa using an online self-administered survey questionnaire. This study evaluates the factors related to predictors of water-conservation motivation behavior at work. The study used the Chi-square statistics (Phi and Cramer's *V*-tests) to test the relationship between Manager's gender and motivation predictors of water conservation at work. Findings from the statistical results showed that the Phi and Cramer's *V*-test gave a *P*-value < 0.05 (*P* < 0.05), which shows that within the sample of managers, there is significant relationship between Manager's gender and the motivation to conserve water. These results highlight that gender orientation affects one's response to water scarcity and motivation for conservation. The variations underscored gender as an important component of sustainable development goals which must be included when implementing policies and programs to promote water conservation consciousness and efficient water use at work.

**Keywords:** gender, motivation, water conservation, water scarcity, workplace

## INTRODUCTION

The principle of water conservation entails the preservation, control and management of water resources. In the era of climate change and variability, scarcity and inequitable access to water, per capita water availability has declined over the last decades (Rouault and Richard, 2003; Rodell et al., 2018). Freshwater scarcity is expected to get worse with global warming leading to further depletion and unpredictability of surface water sources. In essence, climate-induced ecological change will alter drinking water availability, reliability, quality, quantity, and accessibility (Cole et al., 2020). Water scarcity could mean scarcity in availability due to physical shortage, or scarcity in access due to the failure of institutions to ensure a regular supply or due to a lack of adequate infrastructure

(United Nations World Water Assessment Programme, 2018). Around 1.2 billion people, or almost one-fifth of the world's population, live in areas of scarcity. Another 1.6 billion people, or almost one quarter of the world's population, face economic water shortage (where countries lack the necessary infrastructure to take water from rivers and aquifers; FAO, 2007). Given the increasing demand for water and the uncertain future in supply, there is a persistent need for nations to engage the public in water conservation. Several strategies have been advocated for water conservation to ensure water security under a looming climate change threat such as water pricing (Dinar et al., 2015; Aprile and Fiorillo, 2017), adoption of water saving technologies (Clarke and Brown, 2006; Klein et al., 2006), water restrictions (Klein et al., 2006), and pro-environmental behavior and environmental education (Zietlow et al., 2016; Aprile and Fiorillo, 2017) among others.

Previous studies have noted that water conservation strategies must go hand in hand with conservation behavior. Fielding et al. (2012), noted the importance of both technological and behavioral approaches to water demand management, whereby technological approaches must be coupled with water conservation behavior that can help to ameliorate the potential for offsetting behavior. Similarly, a study by Martínez-Espiñeira and García-Valiñas (2013) concluded that issues of water scarcity can be ameliorated through household adoption of water-saving technologies and by adaptation of consumption behavior. Developing water conservation behaviors, attitudes and practices in addition to water saving technologies all have a role to play in determining water use and water consumption. Willis et al. (2011) noted that those water users with positive attitudes toward environmental sustainability would tend to be more cautious when using water than those who do not highly value or consider the environment.

The need to manage the usage of water through measures such as efficient water use and improved technology; to reuse and recycle water as far as possible, in accordance with applicable rules and regulations provides further motivation to address the lack of conservation behavior especially at work. This process should include on site water conservation which is critical as it helps to reduce the amount of water used and to contribute to the sustainable use of water. In other words, water conservation can be employed at all levels in the organization (top to bottom) to ensure the conventional use of water during drought and other times when water is in short supply. Employees can integrate water saving behaviors which could set environmental sustainability norms and perceptions within the workplaces. Such set of norms and perceptions could generate environmental conduct and awareness, which eventually could build environmental values toward sustainable utilization of resources (Pooley and O'Connor, 2000); in this case water resources.

Research on environmental values has also illustrated gender differences in explaining the behavior toward natural resources. Boeve-de Pauw et al. (2012) described environmental values as "how people view the natural environment and their relationship to it." The most common explanations are based on socialization theory (Zelezny et al., 2000) which posits that women have a

greater moral obligation to act pro-environmentally than men as a result of gender-based socialization processes (Lee et al., 2013). Women tend to be more sensitive to the feelings and needs of others; and are thus more concerned about the environment than men. According to Eagly (1987), females across cultures are socialized to be more expressive, to have a stronger ethic of care, and to be more interdependent, compassionate, nurturing, cooperative, and helpful in caregiving roles; males, however, are socialized to be more independent and competitive. In theory, women are more motivated to work for the environment compared to men who are more focused on economic issues, are the main earners, and see themselves as more detached from the natural world (Zelezny et al., 2000).

Empirical studies have shown that women seem to have greater concern for the environment than men (e.g., Zelezny et al., 2000; Dietz et al., 2002). The gender differences have been explained using gender socialization theory (Zelezny et al., 2000) which posits that women have a greater moral obligation to act pro-environmentally than men as a result of gender-based socialization processes (Lee et al., 2013). In the water resources sector, the study by Tong et al. (2017) noted differences in the motivations to engage in water conservation practices between females and males. Female users adopted water conservation practices mainly to save water costs, whereas male users practice water conservation practices mainly to alleviate water supply shortage. Singha and Eljamal (2021) found significant positive behavior among female participants who exhibited a more optimistic attitude and were more concerned about water conservation. They were also more concerned about environmental issues than male participants; and more engaged to water conservation than males.

Scholars in the field of conservation psychology relate environmental value to individual cognitions/emotions/behavior, conceptualized in terms of the cognitive or emotional connections individuals have with nature (Schultz, 2001). Such values are not only pertinent to one's perception and knowledge toward environmental issues but also toward the behavior that one consequently conducts (Law et al., 2017; Lin and Niu, 2018). In addition, the way in which environmental values are institutionally defined, may influence policy decisions relating to behavioral change incentives. Behavioral theories lead to emphasis placed on the study of specific behavior in a society. This is where there is an understanding that behavior is developed through conditioning which occurs as a specific response to specific stimuli. Behaviorists believe that peoples' responses to environmental stimuli shape their actions.

Previous research findings suggest that human behaviors and business activities are some of the major underlying causes of climate change and environmental problems (Cudmore, 2015). Steg and Vlek (2009) noted that in order to prevent environmental disaster, human behavior needs to change significantly through pro-environmental behavior (PEB). Pro-environmental behavior (PEB) seeks to minimize the negative impact of one's actions on the natural and built world (Kollmuss and Agyeman, 2002) and PEB can be adopted in workplaces to lessen negative environmental impacts. Yuriev et al. (2018) noted that workers in any organization can

voluntarily perform numerous environmental behaviors such as recycling, carpooling, or willingness to conserve water as an initiative to natural resources management. In other words, there is a growing body of literature highlighting pro-environmental behavior in the workplace (Blok et al., 2015; Paillé and Raineri, 2015; Chakraborty et al., 2017; Robertson and Carleton, 2017; Kukkonen et al., 2018).

However, there is a bias in literature where numerous models have been produced to explain pro-environmental behavior (PEB) in a domestic setting, but workplace behavior is under-represented, and not fully understood (Blok et al., 2015). Similarly, studies on PEB focusing on water resources have tended to focus on households or private spheres with minimum attention on the workplace. Although the studies done on private or household PEB have produced important findings, it is uncertain if the results of those studies can be generalized to the workplace (Wesselink et al., 2017). Fatoki (2019) noted that employed individuals spend a major part of their time at work and; industrial and commercial activities produce significantly more greenhouse gases emission than homes. It is expected that PEB in the workplace will contribute significantly to the minimization of the negative impact of employee's actions on the natural and built environment (Blok et al., 2015). The gap exists due to the few studies that have been conducted in explaining PEB, in this case motivation toward water conservation, exclusively in the workplace. The present study has focused on the Managers' intentions and conscious decisions to conserve water in the workplace by using the COM-B theory.

Water conservation depicts behavior in response to situations of water availability, water scarcity, demand and supply. In the face of the negative impacts of climate change on water resources in Iran, Pakmehr et al. (2021) noted that demand appraisal and self-efficacy were significant predictors of problem-focused coping, which, in turn, influenced adaptation responses. According to this view, people respond to various stimuli that influence them to make decisions when consuming and conserving water even at the workplace. Therefore, this study assessed the response to water scarcity through behavioral change among Managers at the workplace. Specifically, the study objective was to evaluate water conservation behavior using several motivation constructs designed to change bad habits (in this case water wastage) to form better habits (that is water conservation). Additionally, the study explored the variations of behavioral change motivations toward water conservation between male and female Managers.

## Theoretical Framework: The BCW Theory and COM-B System

The Behavior Change Wheel (BCW) model (Michie et al., 2011), based on behavior change theory, contains three distinct behavior conditions: capability, opportunity and motivation (the COM-B dimensions). The COM-B theory is one of the most recent behavior change models. According to Michie et al. (2011), the COM-B model of behavior change postulates that behavior (B) occurs as a result of interaction between three

necessary conditions which are capabilities (C), opportunities (O), and motivation (M). The proximal determinants of behavior are capability which encompasses the individual's psychological and physical capacity to engage in the activity concerned. It includes having the necessary knowledge and skills. Opportunity is defined as all the factors that lie outside the individual that make the behavior possible or prompt it (Michie et al., 2011). Motivation is defined as all those brain processes that energize and direct behavior, not just goals and conscious decision-making. It includes habitual processes, emotional response, as well as analytical decision-making. However, voluntary behavioral change must be accompanied by information messages and/or communication about water conservation. Addo et al. (2019) recognizes that the communication of conservation messages encourages behavioral changes that result in sustainable water conservation. The contents of such communications must be framed with messages for water-conservation behavior.

The theoretical argument of COM-B theory is grounded on the notion that a person's mechanism of changing behavior depends on the psychological-social factors of capability, opportunity, and motivation. This study focuses on the motivation dimension of the COM-B theory to assess the associations between sociodemographic characteristics of Managers and water conservation behavior. The motivation dimension comprises of intrinsic and extrinsic factors to an individual that direct behavior. Embedded in the motivation dimension are two sub-types namely: reflective and automatic motivation. Reflective motivation involves beliefs about what is good and bad, conscious intentions, decisions and plans (Michie et al., 2011) of the behavior (e.g., a Manager intending to be conscious of the amount of water use in each day). Automatic motivation involves emotional reactions, desires (wants/needs), inhibitions and reflex responses which activate or inhibit behavior, often resulting from associative learning and physiological states (Michie et al., 2011) (e.g., lack of water saving devices inhibiting water conservation at the workplace). In essence, motivation dimension of the COM-B is a system for linking behavioral conditions to specific types of behavior-change interventions and policies (Michie et al., 2011).

The BCW framework and COM-B system have been applied in several disciplines and contexts. Barker et al. (2016) applied the COM-B model to identify the determinants of behavioral planning on the part of audiologists; a potentially important factor in encouraging long-term hearing-aid use. The authors found that behavioral planning might be more likely to occur if audiologists' psychological capability, physical and social opportunity, and reflective and automatic motivation were addressed. Addo et al. (2019) applied the BCW framework and COM-B system to examine the effectiveness of messages related to household water use on water scarcity and intentions to act. The authors found that the message framed in terms of specific water-saving tips/strategies were mediated by increasing households' capacity (self-efficacy), opportunity and/or motivation in water-conservation actions. The study concluded that specific water-conservation strategies made available to

households have a stronger impact on water-conservation behavior because these messages appeal to behavioral change conditions.

## The Current Study

The current study reports the results from a survey which sought to determine the prevalence of and contributing factors toward a water conservation mindset among managers at the NWU-Mahikeng Campus. The study area, located in the North-West province of South Africa is located in a semi-arid environment with rainfall of less than 400 mm/annum and experiences high evapotranspiration rates. Water usage on the NWU-Mahikeng Campus has remained steady at an average of 62.4 L per person per day, exceeding the basic demand of 60 L of water per person per day (Department of Water Sanitation., 2018). In contrast with energy measurement and consumption, there are no mechanisms to measure and monitor water usage within the institution. The NWU physical infrastructure policy is silent about water consumption and efficient usage (North West University, 2015).

The Department of Water Sanitation (2016), implemented sectoral water conservation strategies focusing on not only civic education, but also water saving initiatives such as the use of low-flow showerheads, dual-flush toilet mechanisms, and rebates for water efficiency certified appliances for both residential and business customers. While these initiatives have yielded plausible results, it is important to note that in public institutions, resource conservation (water and energy) is based on the individuals' and the groups' conservation attitude toward public goods. This paper reports on the motivations surrounding water conservation decisions and behavior among Managers in response to water scarcity in the study area. Specifically, it addresses one of the challenges faced by the water sector, namely the balance between supply and demand, climate change and variability which is compounded by the inefficient management of water usage especially in the workplace. In this study, two specific questions were addressed: (i) what factors motivate Managers to conserve water at the workplace? (ii) Is there any difference in the response to water scarcity between male and female Managers?

## MATERIALS AND METHODS

The main purpose of this study was to determine the prevalence of and factors contributing to a water conservation behavior among managers at the North-West University—Mahikeng Campus. The study explored if Manager's conscious intentions, beliefs, and emotional reactions about water conservation are based on gender. A quantitative cross-sectional design was adopted through a survey questionnaire with selected senior management in their capacity as high level decision makers. This study used the motivation dimension of the Behavior Change Wheel, COM-B framework to review reflective and automatic motivations associated with water conservation behavior at the work place. A list of eight questions were presented to respondents and the respondents had to pick multiple responses to reflect their opinion. A correlational research design using

Chi-square Pearson correlation analysis was used to describe the relationships between constructs of reflective and automatic motivation and water conservation behavior among managers at NWU-Mahikeng. The strength of the relationships was tested using Phi and Cramer's *V*-tests. Relationships were cross tabulated using gender as the independent variable and motivation items as the dependent variable.

## The Target Respondents

For this study, a structured questionnaire was distributed using survey monkey to 83 top level managers at NWU—Mahikeng and 72 responded representing a total response rate of 87%. The total number of respondents that participated in the survey were eight managers from the support cluster and 64 managers from the academic cluster. Academic top-level managers included Deans, Deputy Deans, Directors, Deputy Directors and Subject Chairs from the six faculties of the NWU-Mahikeng and the Directors and Deputy Directors of research entities while the key support sections included: People and Culture (employee relations section), Finance and Facilities, and Research Support. These respondents were purposively chosen as respondents in their capacity as high-level decision makers. Managers are responsible for getting things done through people and other resources; they are involved in planning and assigning work to others, monitoring their performance, coaching, problem-solving, re-solving disputes as well as influencing work behavior (McIntosh and Luecke, 2011). It is perceived that Managers are role models and their behavior can influence the ethical conduct and prosocial behavior of employees through motivation and support (Fatoki, 2019). For employees, PEB is voluntary and Managers can transfer organizational cultures to employees through social exchange, motivation and encouragement (Wesselink et al., 2017), as propagated by the social learning theory (Bandura, 1977), the majority of human behavior is learned through modeling. Therefore, acceptable behavior is learned by subordinates through interaction with and emulation of their role models, usually leaders (Fatoki, 2019).

## Data Analysis

### Reliability of Measuring Instrument

Reliability in research is a measure of quality in quantitative studies to assess the accuracy of the instrument. In other words, the extent to which a research instrument consistently has the same results if it is used in the same situation on repeated occasions (Heale and Twycross, 2015). In this study, reliability and internal consistency have been tested by using Cronbach's Alpha, an arithmetic operation which is used to assess the reliability or internal consistency of a set of test items (Cronbach, 1951). Cronbach Alpha coefficient assesses reliability and the higher the alpha coefficient, the more the items of the instrument are said to be reliable. However, some scholars have documented that an Alpha coefficient of possibly at least 0.7 is equally reliable (Vaus de, 2002; Yong and Pearce, 2013). In this study, the Cronbach Alpha coefficient for the subscales were reported as 0.83 for the motivation items.



To assess the motivation dimension of the COM-B system, frequency tables were drawn and further cross tabulated to describe and estimate the relationships between reflective and automatic motivation constructs and water conservation behavior. Chi-square Pearson correlations were utilized to test the statistical significance of any observed relationships. Only cases that fulfilled the additional assumption concerning the “minimum expected cell frequency,” which should be 5 or greater (Pallant, 2005; Saunders et al., 2007), were included in the analysis.

## RESULTS AND DISCUSSION

### Characteristics of the Respondents

The majority of the respondents (61.1%) were male, while 38.9% were females; the majority were Subject Chairs or Heads of Departments (43.1%), whereas only 9.7% were Deans and Deputy Deans. In terms of the post level category, more than 88.9% of the respondents were from the academic sector, with only 11.1% respondents occupying a position in the support sector of the university. With regard to the number of service years on the Mahikeng Campus, the majority (50.0%) of the respondents served in management for a period of 5 years and longer, holding different portfolios. Only 11.1% had been involved in management for about 1 year.

### Overall Motivation Dimension and Water Conservation

In terms of workplace water-use behavior outcomes, the study measured workplace water conservation (e.g., responsibility, consciousness, desire, intentions, and beliefs). A range of predictor inclinations were revealed using the motivation dimension of the COM-B framework. Respondents reported that both reflective and automatic motivation played a role in determining the likelihood of them conserving water at the workplace. **Table 1** shows the prevalence of motivation predictors and inhibitors toward water conservation at the workplace.

In terms of the motivation constructs involving emotional reactions, desires (wants and needs), impulses, reflex responses, and habits (Chandlert and Kapelner, 2013), some of the respondents (88.9%) reported being more motivated by the inherent satisfaction and desire to purposely conserve water whenever and wherever they can ( $M = 0.89$ ;  $SD = 0.316$ ). Results in **Table 1** show that 83.3% of the respondents believe that “it is everyone’s responsibility to conserve water for the future” ( $M = 0.83$ ;  $SD = 0.375$ ). For the motivation construct of “it is everyone’s responsibility to conserve water for the future,” the response pattern of the respondents suggests that water conservation activity is undertaken out of interest, enjoyment, or inherent satisfaction (Chandlert and Kapelner, 2013). These results are consistent with previous research which suggested that the more individuals perceive their activities as a moral obligation to save for future generations, the greater the intention will be to engage in a high level of conservation (Boazar et al., 2019); in this case water conservation behavior. Having the perception of a moral responsibility to conserve water for the future, could be a motivating factor to respond to water scarcity and achieve water

**TABLE 1** | Motivation inclinations of managers toward water conservation in the workplace ( $N = 72$ ).

Scale and item	Mean	SD	Frequency	Percent
I conserve water whenever and wherever I can	0.89	0.316	64	88.9
It is everyone’s responsibility to conserve water for the future	0.83	0.375	60	83.3
It pays to save water around the Campus	0.56	0.500	40	55.6
It is good to be conscious of the amount of water used in each day	0.56	0.500	40	55.6
It is advisable to use quality water-efficient appliances	0.50	0.504	36	50.0
I lack environmental values and conservation attitudes	0.39	0.491	28	38.9
It is impractical for me to conserve water	0.22	0.419	16	22.2
Lack of motivation affects my water-conservation behavior	0.17	0.375	12	16.7

conservation behavioral change. Thus, if individuals believe that engaging in water conservation behaviors is a wise, necessary, and beneficial act and derive pleasure and satisfaction from doing so, they likely have more intention to adopt water conservation behaviors (Shahangia et al., 2021).

Some of the respondents (55.6%) reported being motivated to conserve water because “it pays to save water around the campus” ( $M = 0.56$ ;  $SD = 0.500$ ) while a similar percentage reported being motivated by their conscious about the amount they use per day (55.6%;  $M = 0.56$ ;  $SD = 0.500$ ). Some of the respondents (50%) perceive that it is advisable to use water-efficient appliances ( $M = 0.50$ ;  $SD = 0.504$ ); which could be a motivating factor toward water conservation behavior. Our findings suggest possible high emotional reactions toward water conservation and positive behavioral change being influenced by conscious “feel good” outcome; majority of the respondents are committed to water conservation and perceive that water conservation is their responsibility. The Managers are concerned with water scarcity in the study area and therefore exhibit habits and desires toward conservation. De Young (1996) argued that participating in environmental action can allow one to gain a sense of satisfaction and an inner sense of wellbeing, alongside a belief that society is benefiting from one’s behavior. Previous studies have shown that utilizing water efficient appliances, water-efficient behaviors are promoted which in turn translates to water conservation in all aspects (Shahangia et al., 2021). Fielding et al. (2012) and Englart and Jedlikowski (2019) reported

that the total replacement of domestic appliances with water-efficient ones can save water 35–50% or even more; while Shahangia et al. (2021) found that intention to conserve water had a direct and positive relationship with an individual's water-efficiency behavior. Addo et al. (2018), noted that lack of water infrastructure and resources are perceived impediments to water conservation behavior.

Additionally, from the results in **Table 1** 38.9% ( $M = 0.39$ ;  $SD = 0.491$ ) of the respondents indicated that “I lack environmental values and conservation attitudes” as one of the inhibitors of water conservation in the workplace. The emotional and reflex reactions toward water conservation at work elicited low mean scores toward water conservation as a response to opinions that “it is impractical for one to conserve water in the workplace” (22.2%;  $M = 0.22$ ;  $SD = 0.419$ ); lack of motivation affects my water conservation behavior (16.7%;  $M = 0.17$ ;  $SD = 0.375$ ). The lower mean scores for these negatively worded motivation constructs suggest that majority of the respondents (83.3%) are motivated to engage in water conservation behavior; 77.8% of the managers perceive that it is practical for one to conserve water in the workplace and 61.1% have environmental values and conservation attitudes.

## Gender Variations Toward Water Conservation in the Workplace

To assess the relationships between gender and the behavioral variables (motivations) and water conservation among the Managers, Chi Square Pearson correlation was employed. In this study, Managers' gender is categorized as male or female. Various Chi-square-based measures were used to detect the strength of the relationship between the test variables, the tests included the Chi-square test, Phi and Cramer's  $V$ . The significance level for this analysis is 5% alpha level or  $P = 0.05$ , whereby the relationship is considered significant if the output statistics gave a significance level of  $P \leq 0.05$ . **Table 2** shows that the results of three constructs, “it is impractical for me to conserve water,” “I lack environmental values and conservation attitudes,” and “it is everyone's responsibility to conserve water for the future” were statistically significant.

Pearson Chi-square correlation values show the relationship while the Phi and Cramer's  $V$ -values shows the strength of association between the constructs and gender. Significant association was found between the motivation inhibitor construct of it is impractical for me to conserve water and water conservation behavior and gender ( $\chi^2 = 13.091$ ,  $r = -0.426$ ,  $p = <0.05$ ). The cross-tabulation results revealed that the majority of the male respondents compared to female respondents had the view that it is impractical for them to conserve water in the workplace. These results suggest that females are more likely to conserve water in the workplace as they perceive no impediment to do so. I lack environmental values and conservation attitudes as a motivation inhibitor construct of water conservation and gender ( $\chi^2 = 11.670$ ,  $r = -0.403$ ,  $p = <0.05$ ). The cross-tabulation results pointed out that the majority of the females compared to the males have environmental values and conservation attitudes. These results are

consistent with the socialization theory which places men as less likely to engage in water conservation. Similarly, Kollmuss and Agyeman (2002), Saphores et al. (2012), and Tong et al. (2017) noted that women are more inclined toward environmentally friendly behavior compared to men.

A significant positive correlation was also observed between the motivation construct “it is everyone's responsibility to conserve water for the future” and water conservation behavior and gender ( $\chi^2 = 9.164$ ,  $r = 0.357$ ,  $p = <0.05$ ). For this motivation construct, the response pattern from the cross-tabulations showed that the majority of the females compared to the males perceive that it is everyone's responsibility to conserve water for the future. This finding is consistent with the study by Hablemitoglu and Ozmete (2010), which reported found that water conservation consciousness is more prevalent among females than males because of past experiences and memories of hard times of water shortage and inconvenience of collecting water. Having experienced water scarcity through first-hand experience of having no water on campus, probably for personal women hygiene, females exhibit concerns about water scarcity and are more likely to conserve water for the future.

## THEORETICAL AND PRACTICAL IMPLICATIONS

Water conservation behavior in the workplace is an issue that needs to be addressed urgently and efficiently as a response to the implications of climate change and variability. This is true particularly in water scarce areas. Persistent water shortages and problems, may require not only technical interventions but also behavioral change to ensure sustainability of water resources. Noticeable features of water conservation motivation constructs were reported by an increased score revealing that organizations can make better use of the Managers' inherent and conscious intentions in promoting pro-environmental behavior at work. This study has demonstrated the existence of relationships between gender and behavior pertaining to water conservation. On that basis, when implementing water conservation activities, Managers should consider incorporating strategies that might trigger positive motivations to conserve water in the workplace.

The study has also shown that one of the key issues impeding motivation toward water conservation is the lack of environmental values and conservation attitudes more among males compared to females. To support high levels of engagement with water conservation beliefs among Managers, institutions may therefore consider socialization programs and environmental education aimed at encouraging conscious intentions and decisions to conserve water in the workplace. This finding means that improving and deepening one's understanding of water scarcity issues might lead to more environmental responsible behavior and thus a higher motivation to conserve water (Seelena et al., 2019). Neerachand (2014), noted that environmental education programs are major variables that need to be considered for ensuring the understanding, awareness and successful implementation of water conservation. Education about

**TABLE 2** | Correlation analysis—gender and water conservation motivation.

Variables	Pearson Chi-square			Phi and Cramer's V	
	Value	df	p-value	Value	p-value
It is impractical for me to conserve water	13.091	1	0.000	−0.426	0.000
I lack environmental values and conservation attitudes	11.670	1	0.001	−0.403	0.001
It is everyone's responsibility to conserve water for the future	9.164	1	0.002	0.357	0.002
It pays to save water around the Campus	2.992	1	0.084	0.204	0.084
It is good to be conscious of the amount of water used in each day	2.992	1	0.084	0.204	0.084
I conserve water whenever and wherever I can	0.468	1	0.494	0.081	0.494
It is an offense not installing water-efficient appliances within the Campus and garden	0.468	1	0.494	0.081	0.494
Lack of motivation affects my water-conservation behavior	0.187	1	0.665	0.051	0.665

climate change and related water resources implications could allow individuals to acquire new knowledge and experiences which can be reflected in generating behavioral transformations. We agree with Middlestadt et al. (2001), who admitted that provided the correct education is given, recipients are more likely to change their behavior and drive conservation of natural resources (in this case water resources).

In addition, the results of this study hold a number of implications for public and private institutions that are interested in promoting water conservation in the workplace. Given the threat of water scarcity associated with climate change and unsustainable use of water resources, institutions have to promote water conservation behavior among top level Managers and trickled down to the employees. The promotion of gender policies is recommended to increase male socialization in order to bridge the existing gaps with a view to increasing motivations toward water conservation behavior.

To explain water conservation behaviors in the workplace, we tested the motivation arm of the COM-B theory, as it was overlooked till to-date in water resources management literature. The COM-B dimensions not only increase behavioral propensity and resilience, but also enable individuals and households to promote and sustain behavioral and attitudinal change toward pro-environmental behavior. This study contributes to the COM-B literature by extending it to include organizational citizenship behaviors like pro-environmentalism and psycho-socialization such as “motivation.” The leadership role of managers in citizenship behavior is responsible for motivating employees to engage in pro-environmental behavior, in this case water conservation behavior in the workplace.

Previous studies of water resource management and conservation, particularly in South Africa, have been limited to water pollution, institutional platforms governing water use, and water demand management (Van Koppen and Schreiner, 2014; Pahlow et al., 2015; Agunbiade and Moodley, 2016). However, the demand for water and the consumption patterns continue to rise amid the challenges of increased population, economic growth and dwindling supplies due

to overexploitation, pollution and climate change. Lessons drawn from this study will generate and add to the scholarly body of knowledge and information about obstacles and perceived contributing factors toward water conservation in the workplace. The study also expands the scope of behavioral interventions to settings where the consumption of natural resources is perceived as a right to public goods. This is a first step toward the development of effective intervention programs for water wastage reduction in workplaces. Since the results of this study deals with the critical connections between water conservation and behavioral change especially in the workplace, the insight portrayed by the findings will result in recommendations in designing policy interventions aimed at reducing the unfavorable effects of unsustainable water uses. Ultimately, strategies to encourage pro-environmental behavior as a response to water scarcity among Managers in high education institutions could be enhanced. Such developments are needed for sustainable water resources management if the Sustainable Development Goal number 6 of the United Nations are to be realized (United Nations World Water Assessment Programme, 2018).

## LIMITATIONS OF THE STUDY

A quantitative cross-sectional research approach was employed. Questionnaires were administered through an online platform, due to Covid-19 restrictions. This type of research approach did not allow probing respondents into their behavioral intentions, i.e., why the Managers behave in a particular way toward water conservation in the workplace. Although effort have been made through this study to determine the motivational factors toward water conservation behavior among Managers at the workplace, the study has unearthed a number of issues that require further research. The current study was cross-sectional, which means that it took a snapshot of the situation regarding behavioral change in the workplace. A longitudinal study can be done to examine behavioral change if water-efficient appliances were to be implemented in the workplace to enhance utilization of water saving technologies.

Additionally, one dimension of the COM-B framework was adopted for this study. Therefore, future studies should consider incorporating all the three dimensions i.e., capability, opportunity, and motivation to identify the barriers and drivers of water conservation as a response to water scarcity and impending climate change implications.

## DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

## ETHICS STATEMENT

Ethics review and approval/written informed consent was not required as per local legislation and institutional requirements.

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## AUTHOR CONTRIBUTIONS

LP conceptualized the research, collected data, formal analysis, wrote the original draft, and editing. YP supervised the research process, reviewed, and edited the draft manuscript. RB contributed in methodology, formal and statistical analysis, reviewed, and edited the draft manuscript. All authors contributed to the article and approved the submitted version.

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