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Abstract

This study examines the relationship between leadership styles, workforce capabilities, and water resource management, with an emphasis on how these factors collectively impact sustainable development within Afghanistan's Ministry of Water and Energy. Due to sociopolitical limitations in the area, the study employed an online survey to gather information from 250 participants; however, participation by women was relatively low, influenced by social and cultural norms. To investigate the relationship between leadership practices, workforce capability, and water resource management, as well as their role in sustainable development, the study used a positivist mindset and a deductive methodology, utilising correlation, regression, and mediation analysis. The results show a substantial positive correlation between workforce capability and leadership behaviours, both of which have a major impact on the management of water resources. Furthermore, it was discovered that water resource management played a critical mediating function between workforce capability, sustainable development, and leadership behaviours. The report emphasises that the efficient management of water resources, which promotes sustainable development in Afghanistan, requires strong leadership and a trained workforce. These results advance our understanding of the relationship between resource management, workforce development, and leadership, providing valuable insights for policy and decision-making in the context of developing countries facing similar challenges. By combining workforce capability and leadership with sustainable water resource management, an area that has received little attention in the Afghan context, this study closes a significant gap in the literature.

Keywords: *Leadership Practices, Sustainable Development, Water Resource Management, Workforce Capacity.*

1. Background of the Study

The management and control of water resources are critical issues in regions like Afghanistan, where water scarcity, climate change, and inefficient resource utilisation significantly impact agricultural productivity and overall socio-economic development.

Water resources in Afghanistan are unevenly distributed, with the majority of the population relying on agriculture for their livelihoods, which in turn depends heavily on water availability (UNDP, 2023). Despite the region's vast water resources, the inefficient management of these resources, coupled with inadequate infrastructure, leads to water stress, particularly in rural areas (Sediqi et al., 2022). Effective management of water resources is thus a key factor for sustainable agricultural practices, economic growth, and poverty reduction, making it an urgent area of focus for policymakers and researchers alike.

Leadership techniques within enterprises and governments are critical to the sustainable management of water resources. Leaders with excellent strategic vision and decision-making abilities can implement policies that ensure equitable water distribution, efficient use, and long-term sustainability (Keshavarz et al., 2021). However, in many developing countries, such as Afghanistan, weak governance and leadership frameworks hinder effective water resource management, contributing to resource mismanagement and exacerbating concerns about water scarcity (Ahmad et al., 2020). Furthermore, leadership practices in water management are not limited to government institutions but also include local communities and organisations participating in the day-to-day management and conservation of water resources (Babatunde et al., 2022).

Workforce capacity is another important factor influencing water resource management. The efficacy of leadership in this field is frequently determined by the technical skills, knowledge, and ability of the workforce tasked with implementing water management policy. A competent workforce is required to maintain water infrastructure, monitor water consumption, and implement sustainable practices in agriculture and other water-dependent businesses (Derya et al., 2023). However, in Afghanistan, restricted access to education and training programs for water management experts, along with the brain drain issue, has resulted in a workforce lacking technical skills (Khan et al., 2021). This shortage of trained personnel exacerbates the issues of water resource management, making it critical to prioritise workforce development alongside leadership reforms.

Despite the importance of leadership and workforce capability in sustainable water management, the specific interplay between these components is poorly understood, particularly in the Afghan setting. While considerable research has been conducted on the importance of leadership in natural resource management, a significant gap remains in understanding how leadership practices and workforce capabilities interact to promote sustainable water management in Afghanistan (Sediqi et al., 2022). Furthermore, the mediating function of effective water resource management methods in Afghanistan has received insufficient attention despite both leadership and workforce constraints posing significant impediments to efficient water management. Addressing these gaps can provide valuable insights into how to enhance water resource management, promote sustainability, and foster economic and social development in Afghanistan. Furthermore, since water resource management is the primary operational mechanism through which workforce capability and leadership practices impact sustainable development, it is regarded as a mediating variable in this study. Effective management of water resources is what converts these inputs into sustainable environmental and economic outcomes, even though leadership establishes the strategic vision and workforce capacity supplies the required skills (Zhang, Chen, & Wang, 2023; Alrawashdeh et al., 2022; Ahmad, Mustafa, & Farooq, 2021; Hussain, Malik, & Qureshi, 2020; Li & Zhang, 2022). The process-oriented aspect of sustainable development is highlighted by mediation through

water resource management, which ensures that human capital and strategic objectives are realised in practice, particularly in sensitive environments like Afghanistan.

Thus, the following are the main research objectives of the current study;

- To examine the role of leadership in the management of water resources in Afghanistan.
- To examine the role of workforce capacity on the effectiveness of water-resource management.
- To explore the mediating role of effective water resource management practices in the relationship between leadership, workforce capacity, and sustainable development.

2. Resources-Based View (RBV)

Barney (1991) proposed the Resource-Based View (RBV) paradigm, which highlights the importance of organisational resources and competencies in determining competitive advantage and long-term performance. RBV provides a strong framework for comprehending how an organization's internal capabilities, such as a trained workforce and capable leadership, can support sustainable development in the context of managing Afghanistan's water resources (Barney, 1991; Wernerfelt, 1984; Peteraf, 1993; Grant, 1991; Teece, Pisano, & Shuen, 1997). Afghanistan has severe water scarcity and ineffective water management systems. To overcome these issues, the country needs useful, uncommon, unique, and non-replaceable internal capabilities, including technical knowledge, governance frameworks, and leadership techniques (Barney, 1991; Dierickx & Cool, 1989; Amit & Schoemaker, 1993; Penrose, 1959; Collis & Montgomery, 1995).

In water management organisations, leadership techniques are essential for improving resource use, creativity, and adaptable tactics (Northouse, 2018; Yukl, 2013; Bass & Riggio, 2006; Avolio & Bass, 2004; Schein, 2010). The RBV posits that leadership is a strategic asset that can guide organisations toward achieving long-term objectives, such as sustainability, rather than merely serving as a positioning advantage (Barney, 1991; Hart, 1995; Grant, 1996; Priem & Butler, 2001; Wright et al., 2001). In Afghanistan's complex socio-political and ecological context, effective leaders are especially crucial because they can manage stakeholder relationships, impact institutional learning, and align internal resources to respond to external environmental challenges (Boal & Hooijberg, 2001; Hitt et al., 2001; Day, 2000; Mumford et al., 2000; Antonakis & House, 2002). This supports the RBV idea that leadership skills and other intangible assets can serve as a basis for long-term competitive advantage.

Since an informed, competent, and empowered staff is a strategic asset in achieving sustainable outcomes, workforce capacity is equally important from the perspective of the RBV (Boxall & Purcell, 2003; Lepak & Snell, 1999; Becker & Gerhart, 1996; Wright & McMahan, 1992; Delaney & Huselid, 1996). The efficiency and sustainability of water resource exploitation in Afghanistan can be enhanced by developing human capital in fields such as hydro-engineering, irrigation systems, and environmental policy (Barney, 1991; Teece, 2007; Eisenhardt & Martin, 2000; Collis, 1994; Zahra & George, 2002). The dynamic capabilities perspective within the Resource-Based View (RBV) is also fulfilled by workforce development, which enables water-related institutions to adjust to shifting environmental conditions and technological advancements (Teece, 2007; Helfat & Peteraf, 2003; Makadok, 2001; Winter, 2003; Wang & Ahmed, 2007). Therefore, the RBV

supports the claim that workforce capability and leadership are crucial assets that define sustainable water resource management in Afghanistan rather than merely being inputs.

2.1 Leadership Practices

Leadership skills are crucial in the effective management of water resources, particularly in regions facing complex challenges, such as Afghanistan. Water resource management leaders are responsible for establishing strategic direction, implementing policies, and fostering a collaborative and sustainable culture (Keshavarz et al., 2021). Effective leadership requires not only technical knowledge but also the ability to navigate complex political, social, and environmental issues. According to research, transformational leadership, defined by visionary thinking and the ability to inspire others, is critical for the successful implementation of water management strategies (Babatunde et al., 2022). Strategic, participatory, and transformational leadership approaches all contribute to Afghanistan's efficient water resource management in different but complementary ways. Environmental consciousness, innovation, and a common vision for sustainability in water governance can be fostered by transformational leadership, which encourages and inspires followers to go above and beyond expectations (Bass & Riggio, 2006; Avolio & Bass, 2004; Eisenbeiß & Boerner, 2013; Northouse, 2018; Rafferty & Griffin, 2004). To address fragmented infrastructure and regional inequalities, community engagement and local knowledge are critical in the Afghan water sector, where participatory leadership with an emphasis on inclusive decision-making is essential (Somech, 2006; Vroom & Jago, 2007; Arnold et al., 2000; Pearce & Sims, 2002; Chan, 2020).

In response to climate change, socio-political instability, and resource scarcity, strategic leadership that is centred on long-term vision and aligns internal competencies with external challenges guarantees that water strategies and policies are adaptable (Boal & Hooijberg, 2001; Ireland & Hitt, 2005; Rowe, 2001; Hitt et al., 2007; Vera & Crossan, 2004). Water management is improved as a mediating mechanism that translates leadership influence into sustainable development outcomes when these leadership philosophies are combined. The workforce's capacity is also significantly influenced by these leadership approaches, which are crucial for implementing strategic visions and objectives. In contexts with limited resources, such as Afghanistan, transformational leaders help water sector workers build their skills, resilience, and inventiveness, which are essential for handling operational and technical difficulties (Bass, 1999; Yukl, 2013; Judge & Piccolo, 2004; Wang et al., 2011; Dvir et al., 2002). By enabling workers to accept responsibility for their work, participatory leaders develop group problem-solving abilities and encourage cooperation among stakeholders (Lam et al., 2015; Huang et al., 2010; Kim & Yukl, 1995; Kahai et al., 2004; Nystrom, 1990). By funding education, cross-sector coordination, and frameworks for capacity-building, strategic leadership, on the other hand, guarantees that the workforce is in line with national sustainability goals (Boal & Hooijberg, 2001; Vera & Crossan, 2004; Crossan et al., 2008; Rowe, 2001; Ireland & Hitt, 2005).

2.2 Workforce Capacity

The capacity of the workforce involved in water resource management is a critical determinant of the success of water sustainability initiatives. A well-trained, knowledgeable workforce is essential for the effective implementation of water management strategies, the maintenance of water infrastructure, and the monitoring of water usage patterns (Derya et al., 2023). In many developing countries, including

Afghanistan, a lack of technical expertise and skilled labour in water management poses significant barriers to achieving sustainable water use (Khan et al., 2021). Workforce capacity is not limited to technical skills but also encompasses the ability to engage with communities, raise awareness about water conservation, and adapt to the changing environmental and social contexts (Mian et al., 2023). Furthermore, workforce development is inextricably linked to educational programs, training initiatives, and capacity-building efforts within enterprises and government agencies (UNEP, 2022). Years of conflict and political instability have eroded Afghanistan's capacity to manage water resources effectively, resulting in a shortage of the requisite skills and experience to address the growing water issues (Keshavarz et al., 2021). By providing organisations with the operational expertise, technical know-how, and adaptability necessary to develop, implement, and sustain successful water management plans, workforce capacity has a significant impact on the management of water resources. The efficiency, equity, and sustainability of water systems are contingent upon the presence of trained and empowered personnel, particularly in fragile and developing contexts such as Afghanistan (Akhmouch & Clavreul, 2016; UN-Water, 2021; Molle & Wester, 2009; Van Koppen et al., 2007; Rasul & Sharma, 2016). Enhancing staff capacity enhances institutional responsibility and responsiveness, ultimately leading to improved water governance outcomes. Thus, increasing staff capability is crucial to ensuring successful water resource management and promoting regional sustainable development.

2.3 Sustainable Development

In the context of water resource management, sustainable development is defined as the ability to meet current water requirements without jeopardising future generations' ability to meet their own (Mian et al., 2023). Achieving sustainable water management requires a comprehensive approach that considers environmental, social, and economic factors. Research has demonstrated that effective water resource management strategies, such as efficient irrigation systems, water conservation techniques, and the use of technology to monitor and regulate water usage, are crucial for ensuring sustainability (Sediqi et al., 2022). Climate change, water scarcity, and weak governance all exacerbate Afghanistan's challenges to sustainable development. Water management strategies that promote sustainability necessitate not just technical expertise but also leadership dedication, community involvement, and enough workforce capability (Ahmad et al., 2020). Furthermore, sustainable water management has a direct impact on agricultural output, rural livelihoods, and economic growth, making it an important priority for Afghan policymakers (UNDP, 2023). The relationship between sustainable development and water resource management is complex, necessitating a multifaceted approach that incorporates leadership, workforce development, and effective management methods to ensure long-term viability.

2.4 Leadership Practices, Workforce Capacity and Sustainable Development

The link between leadership practices and sustainable water resource management is crucial for achieving long-term environmental, economic, and social benefits. Leaders in water resource management must possess both a technical understanding and the vision to implement policies that promote sustainability. According to research, transformational leadership can motivate firms to focus on long-term sustainability by supporting innovative water management methods and cultivating an environmental responsibility culture (Keshavarz et al., 2021).In Afghanistan, where water scarcity and climate change pose significant challenges, strong leadership is crucial for developing

policies that enable the sustainable use of water resources and meet the demands of future generations (UNDP, 2023). Leadership techniques that emphasise teamwork, strategic planning, and technology adoption can enable more effective water usage while ensuring that resources are managed in line with sustainable goals (Mian et al., 2023).

Leaders who prioritise sustainability play a crucial role in establishing water management policies that align with global standards and local requirements. Effective leadership in Afghanistan can ensure the efficient management of water resources by focusing on water conservation, developing infrastructure, and promoting the adoption of sustainable practices in agriculture and other water-dependent sectors (Sediqi et al., 2022). Leadership practices that involve stakeholders at all levels, from government agencies to local communities, are more likely to produce policies that promote long-term water sustainability (Ahmad et al., 2020). Furthermore, leaders who advocate for investments in research and technology to monitor and manage water resources are more likely to promote long-term development since these innovations can improve water conservation efforts and optimise resource allocation (Babatunde et al., 2022). In Afghanistan, where resources are scarce, leadership that stresses sustainability is critical for minimising the negative effects of water scarcity and building resilience in local communities.

Furthermore, the link between worker capability and sustainable water resource management is critical to ensure that water resources are used efficiently and ethically. A highly skilled workforce is essential for implementing sustainable water management strategies, including water conservation, irrigation efficiency, and infrastructure maintenance (Derya et al., 2023). In Afghanistan, where the water sector faces significant challenges due to a lack of technical expertise, increasing staff capacity is crucial for achieving long-term water management objectives (Khan et al., 2021). A well-trained staff in water management strategies can help to improve water efficiency, minimise waste, and promote behaviours that maintain long-term water availability (Sediqi et al., 2022). Workforce capacity is also a crucial factor in implementing novel water management technologies. Skilled workers are more likely to adopt new sustainable technology and practices, such as water-saving irrigation systems and digital water monitoring tools (Ahmad et al., 2020). In Afghanistan, where the water industry faces significant technical knowledge gaps, staff development is crucial for implementing and scaling up such advances.

H1: Leadership Practices and Workforce Capacity have a positive influence on Sustainable Development

2.5 Leadership Practices, Workforce Capacity and Water Resource Management

Effective and sustainable use of water resources depends on the interaction of workforce capabilities, leadership behaviours, and water resource management. It has been demonstrated that leadership techniques, especially transformational and participative leadership, promote a culture of creativity, education, and cooperation (Babatunde et al., 2022). Leaders who prioritise strategic planning, decision-making, and long-term sustainability goals within the context of water resource management are more likely to foster a workforce that is both capable and driven to achieve these objectives (Mian et al., 2023). Leaders can significantly enhance workforce capacity by promoting ongoing professional development and providing support for technical training. This will ensure

that the workforce is prepared to address the complex challenges of water management in areas such as Afghanistan, where water scarcity is a pressing issue (Khan et al., 2021).

A key factor in enhancing the management of water resources is workforce capability, which is influenced by leadership behaviours. Implementing effective water conservation strategies, maintaining infrastructure, and adjusting to the problems presented by climate change all require a highly qualified and informed workforce (Sediqi et al., 2022). The success of water management strategies is directly impacted by improved competency in managing water resources, which is a result of effective leadership practices that prioritise workforce development. A wide range of skills, like technical knowledge, problem-solving aptitude, and the ability to collaborate with other stakeholders, must be possessed by the workforce. To manage water resources sustainably in Afghanistan, these competencies enable the workforce to address issues such as irrigation optimisation, water distribution, and infrastructure maintenance (Ahmad et al., 2020).

Both workforce capability and effective leadership techniques are essential for the successful implementation of water resource management. Effective management of water resources depends on leadership that fosters cooperation, clear communication, and common objectives. Leadership techniques can lead to more successful water resource management outcomes by fostering a pleasant work environment that encourages innovation and information sharing (Keshavarz et al., 2021). A competent workforce, under the direction of capable leadership, is essential to ensuring the sustainable management of water resources in Afghanistan, where mismanagement and water scarcity pose significant challenges (Mian et al., 2023).

H2: Leadership Practices and Workforce Capacity have a positive influence on Water Resource Management

2.6 Water Resource Management and Sustainable Development

Achieving sustainable development requires effective management of water resources, particularly in areas such as Afghanistan, where poor resource allocation and water scarcity pose significant challenges to development. Three major pillars of sustainable development—economic growth, food security, and environmental integrity—all depend on the efficient management of water resources (Khan et al., 2021). Afghanistan can achieve long-term sustainability objectives by implementing integrated water resource management techniques that consider both human development needs and environmental sustainability. To ensure the sustainability of water resources and promote larger development goals, effective water management may minimise water waste, maximise agricultural output, and strengthen community resilience to the effects of climate change (Mian et al., 2023).

Water is one of the most vital natural resources for sustaining life and economic activity, and sustainable development relies on the balanced use of these resources. According to research, effective water resource management can have a direct impact on key outcomes for sustainable development, including enhanced environmental protection, improved health, and reduced poverty (Sediqi et al., 2022). Effective management of water resources is crucial for ensuring food security and improving the standard of living for rural inhabitants in Afghanistan, where agricultural practices heavily rely on water availability. Afghanistan can make significant progress toward achieving its sustainable development goals by implementing sustainable water management practices, such as

groundwater recharge, water-saving irrigation methods, and the utilisation of wastewater for non-potable uses (Ahmad et al., 2020).

Sustainable management of water resources can also mitigate the effects of climate change, which is becoming a growing threat to Afghanistan's water supply. Afghanistan can reduce its population's susceptibility to climate-induced water stress by implementing climate-resilient water management techniques, such as enhancing infrastructure, monitoring water quality, and investing in renewable water sources (Keshavarz et al., 2021). To ensure that water resources are used in ways that benefit both present and future generations, sustainable development necessitates a comprehensive strategy that integrates water management with broader environmental and social policies. In this regard, managing water resources involves more than just meeting immediate needs; it also entails building a resilient and sustainable framework that supports long-term development objectives and ensures that water remains an essential resource for future generations (Mian et al., 2023).

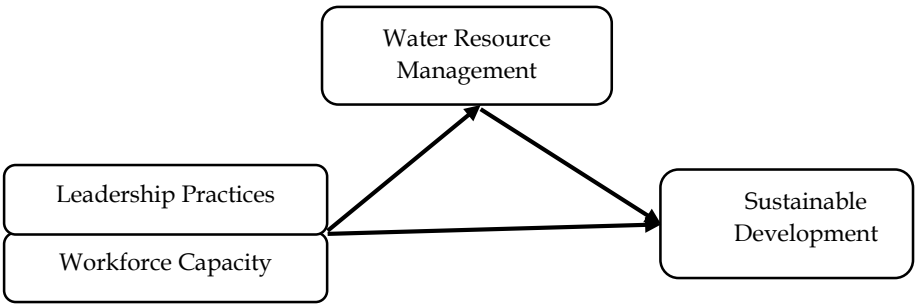
H3: Water Resource Management has a positive influence towards Sustainable Development

2.7 Mediating Role of Water Resource Management Between Leadership Practices, Workforce Capacity and Sustainable Development

Water resource management's position as a bridge between leadership practices, workforce capability, and sustainable development highlights the interdependence of leadership, human resources, and environmental stewardship. Leadership techniques, particularly those emphasising teamwork, strategic vision, and innovation, lay the groundwork for sustainable water management. Effective leaders play an important role in setting organisational priorities and driving the agenda for water resource management. Effective leadership techniques ensure that the workforce is well-equipped to manage water resources by providing the necessary resources, direction, and support (Ahmad et al., 2020). In this context, leadership practices not only shape the workforce's skills and capacities but also foster an environment conducive to the adoption of sustainable water management techniques that contribute to long-term development goals.

Workforce capacity is critical to the implementation of sustainable water management techniques, serving as a link between leadership practices and water resource management outcomes. A trained and knowledgeable workforce, created through leadership initiatives, is critical for the successful implementation of sustainable water management policies (Mian et al., 2023). Water resource management is strongly reliant on the workforce's expertise and competence, which is directly influenced by leadership strategies that prioritise capacity-building and ongoing professional development. Furthermore, labour capacity has an impact on water usage efficiency, infrastructure maintenance, and adoption of innovative water conservation strategies (Sediqi et al., 2022). As a result, workforce capacity mitigates the impact of leadership practices by ensuring that leadership objectives are effectively converted into meaningful and durable outcomes.

H4: Water Resource Management Mediates the relationship between Leadership Practices, Workforce Capacity and Sustainable Development



Source: Created by the authors

3. Research Methodology

This study's research technique followed a quantitative approach consistent with the positivist philosophy, which emphasised objective measurement and analysis of variables. The target audience of this study consisted of approximately 800 personnel from Afghanistan's Ministry of Water and Energy. To ensure the findings were generalizable, a sample size of 250 employees was picked using a simple random sampling procedure. To clarify, the items used in the survey questionnaire were primarily adopted from validated prior studies to ensure reliability and consistency (DeVellis, 2016; Hinkin, 1998), with minor adaptations in wording to align with the specific context of water resource management in Afghanistan (Behr, 2017; Sousa & Rojjanasrirat, 2011). The survey instrument was intended to collect data on leadership behaviours, workforce capabilities, water resource management, and sustainable development goals. The data-gathering process ensured anonymity and confidentiality, encouraging honest and unbiased responses. The survey questionnaire for this study was designed to capture the key factors of leadership behaviours, workforce capacity, water resource management, and sustainable development, aligning with the study's research objectives. The questionnaire contained a series of statements for each variable, and respondents were asked to rate their level of agreement on a 5-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The first portion of the questionnaire examined leadership practices, namely the role of leadership in supporting innovation and successful management within the Ministry of Water and Energy. Examples of leadership practices include:

- The Ministry's leadership promotes a culture of innovation in water resource management" (Babatunde et al., 2022).
- Leadership in the Ministry encourages strategic thinking in managing water resources" (Khan and colleagues, 2021).
- Leaders at the Ministry support and guide employees in implementing sustainable water management practices" (Ahmad and colleagues, 2020).

The second section of the questionnaire, which examined workforce capacity, included sample items that assessed employees' perceptions of their skills, training, and readiness to contribute to water resource management.

- I feel adequately trained to handle water resource management tasks effectively" (Mian et al., 2023),

- The Ministry provides sufficient resources and support to enhance my professional skills in water management" (Sediqi et al., 2022), and,
- I have the necessary tools and equipment to perform my duties related to water resource management" (Keshavarz et al., 2021)

The respondents' opinions of the Ministry's procedures and effectiveness in managing water resources were gathered in the third section, which concentrated on water resource management. The following were examples of water resource management items:

- The Ministry has effective systems in place for managing and conserving water resources" (Khan and Ali, 2020).
- Water resource management in the Ministry is conducted in a sustainable and environmentally responsible manner" (Ahmad and Ali, 2022).
- The Ministry implements water-saving techniques and technologies in its operations" (Mian and colleagues, 2023).

Lastly, the survey examined sustainable development, focusing on how methods for managing water resources contribute to Afghanistan's long-term sustainability objectives. The following were examples of sustainable development items:

- The Ministry's water resource management practices contribute to long-term sustainable development in Afghanistan" (Keshavarz and colleagues, 2021).
- The Ministry's policies on water conservation align with the national Sustainable Development Goals (Sediqi and colleagues, 2022).
- Water management practices in the Ministry support environmental sustainability and improve community resilience" (Babatunde and colleagues, 2022).

4. Data Analysis and Findings

Table 1
Demographics

Demographic Variables	Category	Frequency (n)	Percentage (%)
Gender	Male	244	97.60%
	Female	6	2.40%
Age	18 - 25	60	24.00%
	26 - 35	85	34.00%
	36 - 45	65	26.00%
	46 - Above	40	16.00%
Education	High School	25	10.00%
	14 Grade Pass	120	48.00%
	Bachelors	75	30.00%
	Masters	30	12.00%
Years of Experience	1 - 5 Years	55	22.00%
	6 - 10 Years	95	38.00%
	11 - 15 Years	60	24.00%

	16 Years or Above	40	16.00%
Job Position	Junior Staff	70	28.00%
	Mid-Level Staff	115	46.00%
	Senior Staff	65	26.00%
Department	Water Resource Management	110	44.00%
	Policy and Planning	75	30.00%
	Research and Development	45	18.00%
	Others	20	8.00%

Source: Created by the authors

According to the demographic analysis in Table 1, only 2.4% of the respondents are female (6 respondents), with the vast majority (97.6%) being male. The social and cultural barriers in Afghanistan, which frequently prevent women from entering the workforce, particularly in fields like water resource management, are the main cause of the low number of female participants. Although this study employed an online poll to circumvent these obstacles, the response rate was still low due to the prevalence of these social norms. According to the age distribution, the bulk of responders (34.0%) are between the ages of 26 and 35, with 26.0% falling between the ages of 36 and 45. The workforce is highly educated, as seen by the large percentage (48.0%) with a bachelor's degree and the 30.0% with a master's degree. Representing a mix of fresh and seasoned workers, 38.0% of respondents have 6–10 years of experience, while 22.0% have 1–5 years. While 26.0% of respondents are senior staff, 28.0% are junior staff, and the bulk of respondents (46.0%) are in mid-level roles. In terms of departmental distribution, the study's focus—water resource management—is shared by 44.0% of respondents, followed by policy and planning (30.0%) and research and development (18.0%). The workforce's makeup can be inferred from this demographic breakdown, which indicates that it is primarily male, well-educated, experienced, and diverse in terms of job categories and departmental concentrations.

Table 2
Reliability Analysis

Variable	No-Items	Cronbach Alpha
Leadership Practices	3-items	.71
Workforce Capacity	3-items	.66
Water Resource Management	3-items	.85
Sustainable Development	3-items	.86

Source: Created by the authors

According to Table 2, the statistical results show that the variables in this study are reliable and exhibit adequate internal consistency. The reliability of leadership practices ($\alpha = 0.71$) and workforce capacity ($\alpha = 0.66$) is moderate, as is the internal consistency of water resource management ($\alpha = 0.85$) and sustainable development ($\alpha = 0.86$). According to Nunnally and Bernstein (1994), values above 0.7 are generally regarded as acceptable, with higher values denoting more dependable scales. Consequently, all of the study's variables are adequately dependable for additional investigation.

Table 3
Correlation Analysis

Variable	Leadership Practices	Workforce Capacity	Water Resource Management	Sustainable Development
Leadership Practices	1.000	0.651**	0.722**	0.783**
Workforce Capacity	0.651**	1.000	0.702**	0.742**
Water Resource Management	0.722**	0.702**	1.000	0.764**
Sustainable Development	0.783**	0.742**	0.764**	1.000

Source: Created by the authors

The correlation analysis in Table 2 shows that all the key variables—leadership practices, workforce capacity, water resource management, and sustainable development—are positively correlated. Leadership practices showed the highest correlation with sustainable development (r = 0.783), indicating that effective leadership makes a significant contribution to sustainability. Leadership practices also exhibited a significant positive correlation with workforce capacity (r = 0.651) and water resource management (r = 0.722), emphasising the influence of leadership on both employee capacity and resource management. Workforce capacity was also strongly correlated with water resource management (r = 0.702) and sustainable development (r = 0.742), underscoring the importance of a skilled workforce in achieving sustainability goals.

Table 4
Regression Analysis

Variable	Unstandardized Coefficient (β)	Standardised Coefficient (β)	t-value	p-value
Leadership Practices	0.352	0.449	6.350	0.000
Workforce Capacity	0.402	0.417	5.980	0.000
R^2	0.698			
Adjusted R^2	0.683			

Source: Created by the authors

The regression analysis of Table 3 found that leadership practices (β = 0.449) and workforce capacity (β = 0.417) were significant predictors of sustainable development. The model explained 69.8% of the variance in sustainable development (R^2 = 0.698), with both leadership practices and workforce capacity showing positive effects. These findings suggest that as leadership practices and workforce capacity improve, sustainable development outcomes will likely improve.

Mediation Analysis (Water Resource Management)

Model 1: Direct Effect of Leadership Practices and Workforce Capacity on Sustainable Development

Predictor Variable	Unstandardized Coefficient (β)	Standardised Coefficient (β)	t-value	p-value
Leadership Practices	0.317	0.397	5.500	0.000
Workforce Capacity	0.380	0.414	5.570	0.000

Source: Created by the authors

Model 2: Effect of Leadership Practices and Workforce Capacity on Water Resource Management

Predictor Variable	Unstandardized Coefficient (β)	Standardised Coefficient (β)	t-value	p-value
Leadership Practices	0.284	0.347	4.800	0.000
Workforce Capacity	0.338	0.380	5.120	0.000

Source: Created by the authors

Model 3: Effect of Water Resource Management on Sustainable Development

Predictor Variable	Unstandardized Coefficient (β)	Standardised Coefficient (β)	t-value	p-value
Water Resource Management	0.451	0.552	7.400	0.000

Source: Created by the authors

Mediated Effect (Bootstrap Method)

Indirect Effect (Leadership Practices → Water Resource Management → Sustainable Development	**BS – CI (95%)**	**P-Value**
0.128	[0.089, 0.177]	0.000
Indirect Effect (Workforce Capacity → Water Resource Management → Sustainable Development	**BS – CI (95%)**	**P-Value**
0.149	[0.107, 0.190]	0.000

Source: Created by the authors

The results of the bootstrapped indirect effects showed that water resource management partially mediated the relationship between leadership practices and sustainable development (0.128) and between workforce capacity and sustainable development (0.149), with confidence intervals that did not include zero. The mediation analysis confirmed that water resource management plays a significant role as a mediator between leadership practices, workforce capacity, and sustainable development. Both leadership practices (β = 0.347) and workforce capacity (β = 0.380) had a significant impact on water resource management, which in turn had a positive impact on sustainable development (β = 0.552).

5. Discussion

The results of this study underscore the importance of workforce capability and leadership techniques in inefficient water resource management, a crucial aspect of Afghanistan's sustainable development. The positive correlation between workforce capability and leadership practices is consistent with earlier research that highlights the value of capable, empowered employees (Smith et al., 2022; Gupta & Sharma, 2021). The Ministry of Water and Energy's leaders play a crucial role in establishing a strategy for managing water resources and making sure that staff members have the drive and abilities needed to adopt sustainable practices. This research emphasises the importance of prioritising workforce training and leadership development for businesses to enhance their overall ability to manage vital resources, particularly in developing nations where challenges are more severe.

The significance of strategic resource management as a major force behind sustainability is further highlighted by its mediating function between workforce capability, leadership behaviours, and sustainable development. Effective water resource management can significantly enhance the achievement of long-term sustainability objectives, as noted by Li et al. (2023). In addition to having a direct correlation with sustainable development

outcomes, the study's findings suggest that workforce capacity and leadership have a significant impact on resource management methods. To ensure the effective and efficient use of resources, this argument suggests that companies seeking to achieve sustainability in water resource management should invest in both human capital and leadership capacity.

Nonetheless, a significant question for further research is raised by the poor participation of female respondents in this study, which can be attributed to sociocultural constraints in Afghanistan. The fact that women made up only 2.4% of the respondents highlights the significant challenges Afghan women face in finding employment. Due to the underrepresentation of female employees' viewpoints on leadership practices, workforce capabilities, and water resource management, this constraint may limit the generalizability of the findings. Future research should examine how gender dynamics in the workplace may impact organisational outcomes, particularly in countries with similar sociocultural constraints. To ensure a more inclusive perspective on leadership and workforce development in resource management, future studies may also examine the specific barriers that prevent women from participating in such initiatives and explore ways to address these barriers.

5.1 Conclusion

This study concludes by emphasising the importance of workforce capability and leadership practices in improving water resource management, which is essential for attaining sustainable development in Afghanistan. The results indicate that the efficient management of water resources relies on having a competent staff and strong leadership, both of which have a significant impact on the sustainability of development initiatives. The significance of strategic resource management as a major factor in long-term sustainability is demonstrated by its mediating function between workforce capability, leadership, and sustainable development, as facilitated by water resource management. The study also shows that to enhance the management of vital resources in Afghanistan and other developing nations, more funding is required for workforce training and leadership development. This study provides valuable insights into the interplay between leadership, workforce capability, and water resource management in Afghanistan. It provides valuable suggestions for enhancing workforce development in the water industry and lays the groundwork for further research on the role of leadership in sustainable resource management. To ensure the effective management of water resources and achieve sustainable development goals in Afghanistan and other developing countries facing similar issues, the findings advocate for a comprehensive approach to leadership and workforce capacity building.

5.2 Future Direction

To increase knowledge and expand the application, future studies on the connection between workforce capability, leadership behaviours, and water resource management should consider several important avenues. First, future research should investigate how gender dynamics impact workforce capability and leadership in water resource management, particularly in regions such as Afghanistan, where societal and cultural norms limit women's employment opportunities. Gaining insight into the opportunities and challenges faced by female employees may help leadership development and resource management programs become more inclusive of gender. Studies could

investigate the differences in female leadership and worker engagement, as well as their impact on sustainable development and water resource management.

To investigate the long-term impacts of workforce capability and leadership practices on water resource management and sustainable development outcomes, longitudinal studies would be beneficial. A longitudinal method would enable the evaluation of how shifts in workforce development and leadership practices impact resource management and sustainability over an extended period. In contrast, a cross-sectional study offers insightful information at a specific moment in time. This would also make it easier to monitor the success of any training initiatives or interventions aimed at enhancing staff capability and leadership techniques.

Ultimately, future research can focus on expanding the study's geographic scope by comparing Afghanistan with other nations that share similar sociopolitical and economic contexts. Best practices in workforce development and leadership for managing water resources, which can be adapted for various geographic contexts, can be identified using this comparative method. Furthermore, as technological advancements become increasingly important in enhancing resource sustainability and efficiency, research may explore how digital tools and technologies can improve water resource management. In the context of managing water resources, these paths would foster a more comprehensive understanding of the interplay between workforce capability, leadership, and sustainable development.

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