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An Evaluation of the Role of Traditional Leaders in Water Resource Management in Mambu- Bafut, Cameroon.

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Abstract

The study evaluates the role of traditional leaders in water resource management in Mambu-Bafut, Cameroon, employing a descriptive, exploratory approach with 50 purposively selected respondents. Data was gathered through structured questionnaires and observations, and analysed using descriptive statistics. Key findings indicate that most participants "agree" or "strongly agree" that traditional leaders have instituted fines on those who throw waste into water catchment areas (mean score of 4.50 and standard deviation of 0.614), increase financial awareness of water management (mean score of 4.42 and standard deviation of 0.499), water availability, quality, and cost should be raised (mean score of 3.94 and standard deviation of 1.202) and building, operating, and maintaining water infrastructure (mean score of 3.94 and standard deviation of 1.202). The study highlights the relevance of traditional leaders and institutions' governance in managing water resources in Manbu-Bafut to enhance sustainability.

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1. INTRODUCTION

Water is the most essential natural resource for human survival (Israelova et al., 2023). It is employed in a range of applications and is essential to human socioeconomic development. Approximately 2.2 billion people worldwide currently need safe drinking water (World Health Organisation, 2025), and water-borne infections kill more than 18 million people each year in developing countries (Fimzole, 2020). Water resource management is the strategic implementation of practices such as integrated

watershed management, reservoir construction, irrigation systems, and wastewater reuse to ensure the efficient and sustainable use of water resources, as well as flood prevention and ecosystem protection (Meetei et al., 2023).

More than 30% of people in impoverished countries such as Cameroon lack basic access to clean drinking water (UNICEF, 2024). This dilemma is exacerbated by ageing infrastructure, increased urbanisation, and climate variability (Fonjong & Zama, 2023), all of which much outweigh the current, insufficient management capacity. According to research conducted in 2008, less than half of Cameroon's population has access to the country's water network, CAMWATER. Alternative sources contained high levels of microbial contamination (Fimzole, 2020). Poor drinking water quality is directly linked to health concerns and is primarily caused by microbial contamination, which is frequent in developing countries (World Health Organisation, 2023). It is critical to understand the risks and provide an appropriate treatment method (Fimzole, 2020). It is anticipated that 70% of the entire population has access to clean water, with 82% coverage in urban areas and 52% coverage in rural areas (UNICEF, 2024).

In Cameroon, just 43% of the population has access to basic sanitation facilities, with a significant difference between urban (58%) and rural areas (22%) (UNICEF, 2024). Over 450,000 Cameroonians were affected by a severe water crisis in 2024-2025 as a result of climate-related factors such as erratic rainfall and increasing flooding, particularly in the North and Far North regions (Tchindjang et al., 2025). Acute shortages are due to insufficient finance for infrastructure upgrades, inefficient water delivery, ineffective governance frameworks, and poor sanitation (Toumba et al., 2025). Because of these challenges, traditional leaders must be involved in the management of water resources in Cameroonian rural areas.

Traditional Leaders (TLs) in Cameroon are actively striving to close the gap between the government's centralised top-down approach and more local methods to water resource management in some places. This underlines the importance of implementing a distributed system for managing water supplies. According to Tantoh and Simatele (2017), Cameroon's water resource governance is primarily supported by this management system, which is centrally managed through the Ministry of Energy and Water Resources (MINEE) with TIs at the local level. This reveals poor top-down management of fresh water and other community resources (Mah, 2016). As project beneficiaries, TLs among local stakeholders play an important role in mobilising local resources for sustainability and implementing follow-up management measures (Chigwede & Nyirenda, 2025).

Local Traditional Authorities (LTAs) and communities are the target of development interventions in Cameroon (Beyonyi & Ile, 2023), but they are not represented or participating in water decision-making (Tantoh & McKay, 2020).To establish true sustainability, interventions must transition from top-down approaches to inclusive frameworks directed by the African Ministers Council on Water (AMCOW) and the Global Water Partnership (GWP)

strategic guidelines (Mutschinski & Coles, 2021). As a result, local initiatives led by so-called water development specialists are frequently insufficient to address the needs of the general public and rural inhabitants (Njoh, 2002). Given this, one of the recommended strategies for inclusive governance of Common-Pool Resources (CPRs) is to leverage existing authorities and institutions to accomplish long-term management of water resources (Baber, 2026). The inclusion of TLs frequently supports the government in implementing the most effective plans for the sustainable management of resources in local communities (Matsiliza, 2024).

Traditional authorities in Mmbu-Bafut have placed a high value on community engagement in community-related concerns, as community members typically pick what issues to solve and how. To support and energise a platform for gathering perspectives from multiple user groups, this study argues that strong traditional leadership, consistent devolution, and active rural community participation can lead to a people-centred, community-driven development process (Neba, 2025). Thus, this study evaluates the role of TLs in water resource management in Mambu-Bafut, Cameroon. The study specifically looks at (1) traditional leaders' participation in water resource management in Mambu-Bafut, (2) traditional institutions' participation in water resource management in Mambu-Bafut, (3) the functions of traditional institutions in water resource management in Mambu-Bafut, and (4) water resource management by traditional leaders in Mambu-Bafut. This study then proceeds with the literature review and theoretical framework, methodological issues, presentation of findings, discussion, and conclusion.

2. LITERATURE REVIEW

2.1 Functions of Traditional Leaders in Water Resources Management

Tantoh et al. (2021) report that Community-Based Management (CBM) operations in Northwest Cameroon are organised by powerful traditional chiefdoms with royal authority over Natural Resource Management (NRM), since regional norms and practices influence people's everyday resource use. TL involvement is the oldest and longest enduring Water Resource Management (WRM) strategy in Mambu-Bafut, Cameroon. As a result, local actors' social and power interactions shape the norms, values, and attributes that define a community (Tantoh et al., 2021). Male-dominated traditional leadership systems shape community micropolitics, human behaviour, and resource distribution (Tantoh et al., 2021). However, the dismal situations that women face can be attributed in part to male-dominated traditional leadership structures (Tantoh et al., 2021). Young people and women, who play crucial roles in most community development programs, are not allowed to express their opinions. For example, in the Bamenda Grassfields, the village head role is traditionally hereditary and subject to succession regulations (Mbuy, 2023). They are also highly valued, particularly because it is thought that they can converse with the gods (Lang, 2024).

According to Daneel (1996), Africans who lived before colonisation felt that their forefathers had established standards for how natural resources should be handled, and that obeying these laws would result in the loss of the land's bounty. In this way, village chiefs, who represent the gods, play a crucial role in WRM and communal development (Ghislain & Ngam, 2023). Traditional chiefs are highly appreciated for their attractiveness, knowledge, and ability to make popular judgments (Rooney & McKenna, 2022). The traditional Council (TC) has made it easier to make WRM decisions and impose fines on defaulters. The TC works with Village Development Associations (VDAs) to design and approve community development initiatives (Che, 2018). This is because rural communities are more likely to initiate self-help service delivery using a decentralised approach supported by the decentralised service delivery framework, and the success of WRM programs depends on local actors' planning and accountability (Tantoh et al., 2021).

For example, mobilisation, participation by all resource users, active community engagement (community work, financial contribution, and decision-making), and respect for TLs all led to the success of Rural Water Delivery Systems (RWDSs) in Njimkang and Baicham (Tantoh et al., 2021). Residents' inability to perform regular maintenance on water infrastructure is a major issue in these areas. Traditional leaders contribute significantly to water resource management by fostering Community-Based Natural Resource Management (CBNRM), local government, and social cohesion (Matsiliza, 2024). Many rural communities, particularly in Africa, rely on TLs to manage both land and water resources, bridging the gap between state-mandated statute legislation and customary practices (Matsiliza, 2024).

2.2 Traditional Water Resources Management (TWRM)

According to Sulemana (2013, p. 19), the term "tradition" or "customary practice" is used here to distinguish between what people consider to be their established practices and rules governing access to natural resources such as water and land, and outside interventions that propose new rules and regulations that people are unfamiliar with. Every ethnic group in the world has its unique traditions (Gans, 1979). Most rural tribes define and reinforce their worldviews through tradition or customary standards (Latham & Chikozho, 2004).TWRM strategies have a solid foundation and are still commonly utilised today. This refers to the indigenous and customary practices of mobilising the community, involving existing community associations in project execution and the government (Neba & Tanga, 2025a), to develop, distribute, and sustain water. Research documents how these strategies continue to shape water governance (Neba & Tanga, 2025b). This body of research demonstrates that TWRM is widespread in rural areas, usually effective, and that some of these systems have been used for many generations. These systems frequently transcend generations and represent indigenous ecological knowledge (Fanteso & Yessoufou, 2022), because these customary practises were decentralised and deeply embedded in local culture,

many successfully survived colonial and postcolonial forces (Sowman & Hasler, 2009).

Most rural livelihoods are dependent on natural resources like land and water, and people's ability to pursue various livelihood options is determined by their behaviours (Sulemana, 2013). People in rural areas who rely on water for a living create authoritative and cooperative partnerships to acquire and maintain water infrastructure (Bisung, 2021). TWRM systems, particularly in dispersed and isolated rural settlements, offer a feasible alternative to improve the quality of life for individuals who live in rural areas who are now facing severe water scarcity (Shearer, 2003). TWRM may face competition from newer water sources. This is due in part to the fact that, while new statutory measures do not apply to all societal sectors, previous water restrictions will continue to apply (Sulemana, 2013). Unfortunately, legislatures continue to enact weak statutory legislation. Legislative duties do not apply in these predominantly rural areas of Africa, where cultures continue to function according to their traditions.

Cameroon has "local customary law" and "formal state law," two forms of norms that manage society, referred to as "legal pluralism" (Alima, 2025). The laws may conflict at times. Legal pluralism has been proven in case studies from Tanzania (Fluet et al., 2006), Zimbabwe (Maraire, 2024), and Blahpane village on Bali Island (Sulemana, 2013). Legal pluralism is essential for Sustainable Water Resource Management (SWRM) (van Koppen, 2017). Two factors contribute to this: first, state law is rarely applied in most rural areas, and second, people are used to customary law, which predates Integrated Water Resource Management (IWRM). This method of thinking is founded on the belief that existing procedures and the regulations that govern them should not be abandoned in favour of more current management approaches.

2.3 Theoretical Framework

This study is based on the concept of decentralisation. According to the decentralisation paradigm, local groups such as communities and TLs are given more decision-making authority, executive power, and administrative competence (Agrawal & Ribot, 1999; Crook & Manor, 1998). Decentralisation reduces the size of a central government by delegating some functions to other branches of government, which remain accountable to the government. However, the central government usually retains the ability to monitor, revoke, or remove entrustments, creating a barrier to meaningful community engagement and ownership (Bhoso, 2013). Because all authorities are centralised in the TC, the decentralisation system limits TLs to the obligations specified by the state, potentially prohibiting full involvement in WRM. Ribot's (2004) focus and arguments emphasise the central government's continued hold on power and authority, albeit to some extent devolved. They further argue that decentralisation may not be a process that promotes increased community involvement, but rather an administrative augmentation of the state's local activities (Ribot, 2004).

Decentralisation in Cameroon, as stated in the 1996 Constitution (Epongo, 2023; Nzofoa, 2023; Munge & Pascal, 2024), seeks to give local leaders greater control over the central government. Although the legal structure is mostly in place, there are certain obstacles to its execution, such as a lack of funding and insufficient local ability (Eteme & Mountouzache, 2024). As a result, residents have little say in local matters, and many decisions are still taken at the central government level. Decentralisation of state power is contentious due to the reasons advanced by numerous writers; nonetheless, some believe it eliminates colonial imbalances and increases local government effectiveness, community involvement, and service delivery (Bhoso, 2013).

The Directorate of Rural Development (DRD)was established within Cameroon's Ministry of Agriculture and Rural Development (MINADER) (Mbangari & Fouepe, 2021), assuming responsibility for CNRM from TIs. This approach is perceived as an attempt to usurp and weaken traditional leaders' authority (Makumbe, 1998; Masendeke et al., 2004). Because local livelihoods rely on natural resources, rural populations in developing nations are frequently excluded from public decision-making processes and considered as subordinates rather than citizens, according to Mamdami (1996) and Ribot (1999 in Ribot (2006).

A successful decentralisation approach must also include allowing communities to influence NRM decisions to reform, enfranchise, and strengthen TIs by giving them meaningful representation and control over substantial natural resources (Adam, 2021). The state's role in collaborating with existing local Traditional Institutions (LTIs), the definition of control areas, and the application of which criteria, particularly in terms of natural resource exploitation between TIs and the state, are all critical issues in the decentralisation process. Furthermore, TIs risk being sidelined or subservient to the state as a result of this process, as decentralisation theory concentrates on how the central government distributes authority to lower levels within its structures while saying little about their clearly defined positions. To achieve SDG 6, which focuses on ensuring the availability and long-term management of water and sanitation for all (van Koppen, 2024), in Mambu-Bafut, a decentralised approach to CWRM will promote more sustainable resource use and exploitation at the local level.

3. METHODS

3.1. Study Area

Bafut is in Northwest Region of Cameroon, north of the Mezam Division (Neba, 2025), between longitudes 09º58´ 10º11́ E and latitudes 06º05´-06º11´ N, (Tita et al., 2015) (Fig. 1). It is located approximately 20 kilometers northwest of Bamenda, the regional capital, and occupies more than 340 square kilometers (Council Development Plan (CDP, 2011), with a population of over 129,000 inhabitants (CDP, 2011). Bafut is in a high basin bounded to the west by the Oshie-Ngie range and to the east by the

Bamenda, Banso, Oku, and Njinikom high plateaus (Suh, 2021). With an average annual precipitation of 2657.2 mm, there are two distinct seasons: the long rainy season (March to November) and the dry season (December to February) (Tita et al., 2015). Atibita et al. (2021) reported an average annual temperature of 24ºC, with lows of 22.3ºC from August to November and highs of 26.7ºC in February. Bafut's natural vegetation is grassland savannah, with grass intermingled with deciduous shrubs and occasional stunted trees (Tita et al., 2015; Tamfuh, 2017). In contrast, raffia bushes and oil palms rule the swampy lowlands (Letouzey, 1980). Human activities, particularly farming (Neba, 2025) and the needs of a fast-growing population, have significantly altered this natural vegetation (Acho-Chi, 1998). The River Mezam and its tributaries flow through the Bafut Subdivision (Tamfuh, 2017). The main river and its tributaries provide a sparse and angular drainage pattern (Tamfuh 2017).

During the dry season, vegetables are only grown in the lowlands near the banks of the Mezam River, the main river that passes through the Bafut Municipality and provides irrigation water (Tita et al., 2015). Flood irrigation is also employed, but manual watering with cans is more prevalent. Vegetables are planted year-round in Bafut to ensure a consistent supply, but production is boosted during the dry season, when it is more profitable (Tita et al., 2015). Most farmers have both a corporate garden and a personal garden for local consumption, which is typically placed a significant distance from the house. The investigation was carried out in Mambu-Bafut. The village is one of the administrative divisions of the Bafut Fondom (traditional kingdom). In terms of administration, Mambu is a second-class traditional chiefdom, reporting to the first-class chiefdom of Bafut, or "Fon"[1] (traditional ruler or chief). The indigenous people in the community under investigation are hunters and farmers who use rainfall and borehole water to irrigate vegetables throughout the hamlet. This enables the researchers to conduct their investigation in Mambu-Bafut, Cameroon.

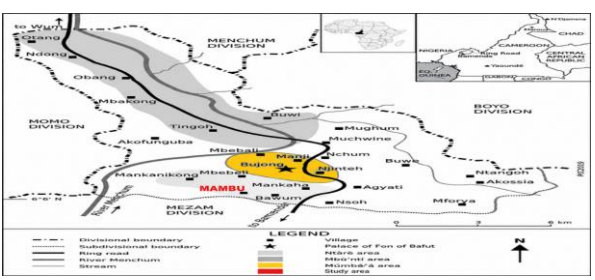

Figure 1: Map of Bafut, Showing Mambu **Source:** Neba (2025)

3.2 Research Design

[1] "Fon" is the appellation of a traditional ruler in the Cameroon grassfield, simply known as chief in English.

The study used a descriptive, exploratory approach to evaluate indigenous participatory water governance in Mambu-Bafut, Cameroon, emphasising how traditional authorities manage vital water sources to minimise regional shortages and safeguard fragile springs. Between March and June 2023, the researchers mapped out three primary water sources serving the community, including "Nki-Mateugeh[2]" (spring), a vital natural spring that local populations historically rely on for daily domestic usage; "Nki-Wah[3]" (spring), a restored and protected spring project donated by the Mambu Social, Cultural, and Development Association (MASCUDA) to improve community access to potable water; and "Asong[4]" Quarter Water Project, inaugurated in January 2023, which includes a (5,000) litre reservoir designed to provide safe, sustainable water to over (3,000) residents throughout the dry season (Plates 1, 2, and 3)

3.3 Study Population, Sample Size and Sampling Procedures and Data Sources

The study population consisted of all 50 members of the Mambu-Bafut traditional council. The emphasis entirely on TC members is justified by their statutory duty as primary guardians of customary laws and indigenous knowledge regarding NRM, such as water and land. This methodological barrier is obviously consistent with the study's objectives, which are to analyse the roles of TLs in WRM in Mambu-Bafut. TC members frequently work with the "Fon" to construct institutions such as the "Kwifor[5]" (Council of Elders or Titled Royals), a male-oriented highest secret society of the land, which controls the local management of land and water in Mambu-Bafut. The evaluation was focused on a census of Mambu-Bafut TC members only. This research targets the governance and traditional administrative structure, often called the “Kwifor”, who assist the “Fon” to ensure high-confidence data on LTIs without larger population sampling flaws.

The evaluation used a purposively selected sample of 50 respondents. According to the Mambu TC Secretary, this sample includes Mambu TC members who have leadership roles in local projects and members of the “Kwifor”. Mambu was purposively chosen for the study because, after decades of living without access to potable water, which harmed the community, the TLs actively participated in the development and management of the village's water supply (Nki-Mateugeh and Nki-Wah" (spring) and the Asong Quarter Water Project. The 50 members of the Mambu TC (26 men and 24 women) were also purposively chosen for the study. This is because traditional authorities act as an alternative source of power and community mobilisation. Because the study objectives typically include developing

[2] Nki-Mateugeh “Nki means water in Bafut, and Mateugeh is the name of the person who founded the spring”, and the spring had been named after the individual

[3] Nki-Wah “Nki means water in Bafut, and Nah is the name of the person who founded the spring,” and the spring had been named after the individual.

[4] Asong is the name of a quarter in Mambu-Bafut

[5] Kwifor “council of elders or titled royals”

practical, community-based solutions to water resource management (such as protecting spring catchments and preventing resource depletion), council members and the “Kwifor” of Mambu-Bafut are the best representatives to explain how TLs protect water as a shared resource.

Due to the limited target population, this research employed purposive sampling to ensure that participants were selected based on qualities relevant to the study's objectives rather than at random, allowing for a comprehensive understanding of the issue. Purposive sampling is a type of non-probability sampling technique in which participants are selected because they have characteristics that you want in your sample (Nikolopoulou, 2023). This sampling approach, also known as judgmental sampling, relies on the researcher's judgment to identify and select the individuals who will provide the most necessary information.

The study included both primary and secondary data sources. Primary data was collected from study participants using a structured questionnaire and observational guide. The evaluation instrument was divided into the following five sections. The first section of the instrument examined the respondents' socio-demographic data (such as sex, age, position in the Mambu-Bafut TC, educational level, and marital status). The second addressed concerns relating to the first study aim of "traditional leaders' participation in WRM in Mambu-Bafut". The third section tackles concerns about the second objective, "traditional institutions' participation in WRM in Mambu-Bafut," like the "Kwifor". The fourth segment concentrated on aim three, "the functions of traditional institutions in WRM in Mambu-Bafut," while the fifth section addressed objective four, "water resource management by TLs in Mambu-Bafut."

To analyse the role of TLs in water resource management in Mambu-Bafut, Cameroon, participant observation (specifically, a participating observer approach) was used to collect qualitative data from research participants. The researchers had to immerse themselves in the community’s daily life to experience and document how TLs govern water resources. During the observations, TC members, "Kwifor" members, and LWM committees serve as major guides. The researchers had to attend and watch village council meetings, paying special attention to how water resource decisions are discussed, legislated, and enforced. The researchers had to walk with local leaders to map out culturally protected water catchments (such as the Asong Quarter Water Project, "Nki-Mateugeh" and "Nki-Wah” springs), as well as observe the physical state of the water supply and any traditional demarcation (for example, sacred forests around water sources). The researchers had to accompany community members on normal water-collection trips or seasonal watershed cleanup activities. This enables the researchers to observe water access firsthand and engage in natural conversations with resource users. A notebook or jotter was used to write down field notes, and snapshots were captured using smartphones in the presence of the "Fon" of Mambu-Bafut, as well as other TC members and community members, in protected water catchment areas.

Participant observation offered vital qualitative data that supported the analysis of TWRM in Mambu-Bafut. By watching customary practices, researchers were able to document practical dynamics that official surveys and interviews frequently overlook, bridging the gap between statutory water regulations and TWRM tactics. Secondary data were acquired from both public and unpublished sources, including books, journal articles, online resources, and library records. The qualitative data collected through observation were triangulated with data received through standardised questionnaires, assuring the validity and credibility of research findings. The review of current literature on several topics helps in the development of research questions on areas for improvement.

3.4 Data Collection

Three researchers and one community volunteer spent a month in the field, administering the observation guide and structured questionnaire to 50 members (both men and women) of the Mambu TC and members of the "Kwifor". To protect the subjects and the study's integrity, necessary ethical approval was obtained. The Divisional Officer (DO) for Bafut and the "Fon" of Mambu approved the study. Every Mambu TC member and members of the "Kwifor" were fully informed of the research objectives, the nature of their involvement, and the potential risks and advantages of doing so. Participants were also informed that they might exit the research at any moment without consequence. This ensures that their participation was completely voluntary and maintains their independence. Participants were told that their responses would be completely secret and that their names would not appear in any published conclusions. To safeguard their privacy, all personally identifiable information would be removed or coded, making it difficult to link comments back to participants. This commitment was to ensure that anonymity protects participants while simultaneously encouraging truthful and open responses, both of which are crucial to the study's validity.

3.5 Validity and Reliability of Instruments

To guarantee the instrument's validity and reliability, the researchers pre-tested the instrument (structured questionnaire and observation guide) in the study area in February 2023, before beginning the actual data collection between March and June 2023. This was accomplished by administering the questionnaire to a small sample of the target population. This was used to identify confusing, biased, or double-barreled questions and was corrected before the actual research, assuring validity and validating that questions were understood as intended and that the constructs were measured correctly. To ensure reliability (trustworthiness), the data from structured questionnaires and observation were triangulated because observation allows the researchers to see behaviour in its natural context, capturing actions or dynamics that participants may not be aware of or may omit on a structured questionnaire, while structured questionnaires provide standardised data and direct insight

into participant attitudes, demographics, or self-reported beliefs ensuring (credibility and dependability) of the research findings.

3.6 Data Analysis

The data was analysed using descriptive statistics in Microsoft Excel version 13 and the Statistical Package for Social Sciences (SPSS) version 25.0. The data was examined, cleaned, entered into a computer-based Excel spreadsheet, and coded. The coded data were then imported into SPSS and evaluated, with the results displayed as frequency tables and percentages. To examine data on respondents' socio-demographic characteristics, questionnaire items were provided with "Yes" and "No" alternatives, and the findings were given in frequency distribution tables and percentages, which were then interpreted. For objectives 1, 2, 3, and 4, respondents were requested to use a five-point Likert scale (Strongly Agree = 5, Agree = 4, Neutral = 3, Disagree = 2, Strongly Disagree = 1) to compute the mean and standard deviation, which were then presented in a table and interpreted.

4. RESULTS

4.1. Socio-Demographic Characteristics of Respondents

Results in Table 1 on sex distribution of study participants revealed that most of the participants were men, 26 (52%), somewhat more than women, 24 (48%). This demonstrates that the Mambu TC has more men than women; the difference is not significant. It is vital to understand why women are under-represented in WRM in Mambu-Bafut, despite their critical role in water issues.

According to the findings, most participants, 19 (38%), are between the ages of 20 and 25, with those over the age of 36 coming in second at 15 (30%). Another 9 (18.0%) of participants were aged 26 to 30, while 7 (14%) were aged 31 to 35. Most Mambu-Bafut TC members are young and have the potential to make significant contributions to the community's WRM. Data from participants' observations shows that:

His Royal Majesty (HRM) Mbah Wanki Ambeche II, the “Fon” of Mambu-Bafut, is young and energetic, and has emerged as a major force in local community development because of his youthful leadership (Plate 4). As with many younger rulers in the Bafut “Fondom” or village, he frequently promotes youth empowerment and community involvement as pillars of his reign (Field Observation, 2023).

Results on marital status suggest that most participants, 34 (68%), were married, 7 (14%) were single, and up to 6 (12%) were widowed, while 3 (6%) were divorced. The community's high marriage rate emphasises the importance of long-term water management solutions, as most couples use water for residential and agricultural purposes on their farms and in their gardens.

Findings on the educational level of study participants revealed that most participants, 23 (46%), have a secondary education, followed by those with a

primary education, 16 (32%), and those with higher education, 11 (22%). This demonstrates that literate and well-educated community water management participants have higher degrees of environmental awareness and a stronger ability to provide practical, long-term, and technical solutions for managing water resources.

The results on position show that 34 (68%) of participants were only members of the Mambu TC, and 7 (14%) of participants were "Kwifor" members, while 6 (12%) were quarter leaders, and 3 (6%) were secretaries for several Mambu-Bafut TC commissions.

Table 1: Percentage and frequency distribution of Socio-demographic characteristics of study participants

Variables	Frequency	Percentage
Sex		
Male	26	52
Female	24	48
Total	50	100
Age	Frequency	Percentage
Between 20-25	19	38
26-30	9	18
31-35	7	14
36 and above	15	30
Total	50	100
Marital status	Frequency	Percentage
Married	34	68
Single	7	14
Widows	6	12
Divorce	3	6
Total	50	100
Educational level	Frequency	Percentage
primary education	16	32
Secondary education	23	46
Higher education	11	22
Total	50	100
Position in the community	Frequency	Percentage
Traditional council member	34	68
Kwifor member	7	14
Quarter leaders	6	12
Secretaries of other commissions	3	6
Total	50	100

Source**:** Authors' calculations

4.2 Traditional Leaders' Participation in Water Resources Management in Mambu Bafut

Table 2 shows that most participants "agree" or "strongly agree" that traditional leaders in Mambu-Bafut have developed new laws and regulations

(mean score of 4.18 and standard deviation of 0.748). This implies that the community recognises their TLs as active custodians who shape public policy, modernise rules, and maintain order rather than just passive observers of ancient customs.

Results further show that most participants "agree" or "strongly agree" that traditional leaders have provided water in various forms in some parts of the village (mean score of 4.00 and standard deviation of 0.881). This suggests that despite potential shortfalls from the central government, TLs successfully act as key change agents, stepping in to fulfil basic community needs.

Findings indicate that most participants disagree that traditional leaders have organised seminars discussing water resources management strategies (mean score of 2.66 and standard deviation of 1,394) in Mambu-Bafut. This suggests that because TLs are seen as inactive in organising such seminars, the community may rely more heavily on external NGOs (Japan Water Forum) or local development associations (MASCUDA) for water-related awareness and infrastructure, and Cameroon Leaders Empowerment Initiative (CamLEI).

The findings further indicate that most participants disagree that TLs have trained experts for the village's water treatment (mean score of 2.42 and standard deviation of 1.56). This highlights an urgent need for government interventions, external training programs, or the hiring of qualified water treatment experts to support TLs.

Data from participant observation further supported this objective by documenting the presence of the Fon of Mambu-Bafut on the day of the inauguration of the "Asong" water project on January 16th, 2023, as part of a large-scale community water project led by the Japanese Water Commission (Plate 5).

The Asong water catchment has received great praise from the Fon, HRM, Mbah Wanki Ambeche II of Mambu-Bafut. The Asong water catchment project includes water hygiene and conservation training, tree planting, a laundry slab, and a water reservoir capable of retaining up to 5,000 litres of water and feeding over 3,000 people in the hamlet and surrounding communities. During the site's inauguration, the Fon (chief) led dozens of joyful people. The Fon, the traditional council, and the "Kwifor" enforce customary laws that restrict farming or logging near vital water catchment areas, thereby preserving natural reservoirs like the "Asong" water catchment from contamination. The Fon and the members of the "Kwifor" emphasised the need to enforce financial fines awaiting defaulters (Field Observation, 2023).

Table 2: Traditional leaders' participation in water resources management in Mambu-Bafut

Items	Sample	Mean Scores	Standard. Deviation
They have developed new laws and	50	4.18	.748

regulations			
They have organised seminars on water resource management	50	2.66	1.394
They have provided water in many forms in some areas of the village	50	4.00	.881
They have trained experts for the treatment of water in the village	50	2.42	1.566
Total	50		

Source: Authors' calculations

4.2.2 Traditional Institutions' Participation in Water Resources Management in Mambu-Bafut

Table 3 shows that most participants "agreed" or "strongly agreed" that traditional institutions in Mambu-Bafut have established roles regarding fines for the discharge of water waste (mean score of 4.28 and standard deviation of 0.904). This implies that residents of Mambu-Bafut respect the traditional authorities' rule and regard their punitive measures (fines) as valid, binding, and authoritative.

Results indicate that most participants were neutral about whether these institutions have built roads to access clean drinking water (mean score of 2.78 and standard deviation of 1.283). This suggests that participants may not be aware of the road projects or may have mixed feelings about footpath maintenance leading to water catchment areas and about road construction.

The results revealed that most participants agreed that traditional institutions have established committees to maintain the water supply (mean score: 3.44; standard deviation: 1.232). This implies that most study participants are aware of the existence of these committees and their activities in WRM in Mambu-Bafut.

The findings indicate that most participants agree that they have educated the villagers about wastewater management and penalties to be paid (mean score 3.58 and standard deviation of 1.230). This shows that, regarding wastewater management and penalty enforcement, information is actively being spread to the residents of Mambu-Bafut.

Table 3: Traditional institutions' participation in water resources management in Mambu-Bafut

Items	Sample	Mean Score	Standard Deviation
Have established roles for fines for water waste discharge	50	4.28	.904
Have built roads to access good drinking water	50	2.78	1.282
Have put in place committees to maintain the water supply	50	3.44	1.232
Educate the villagers on wastewater mismanagement	50	3.58	1.230
Total	50		

Source: Authors' calculations

4.3 Functions of Traditional Institutions in Water Resource Management in Mambu-Bafut

Table 4 indicates that, on average, participants disagree that traditional institutions had made water treatment and storage a subject in community schools (mean score of 2.36 and standard deviation of 1.258). This indicates a clear and collective agreement among participants that this specific educational activity did not take place in Mambu-Bafut.

Results revealed that most participants disagree that traditional institutions have made it easier to collect water taxes in the village (mean score of 2.64 and standard deviation of 1.241). Consequently, relying on traditional institutions may be creating administrative disorder, leading to non-compliance by residents of Mambu-Bafut, or causing disorder and confusion among residents. Policymakers should consider modernising the billing system by directly involving households or improving the transparency of the tax collection process regarding WRM in Mambu-Bafut.

The findings further that most participants "agree" or "strongly agree" that these traditional institutions have provided good storage water forms (mean score of 3.54 and standard deviation of 1.216). This finding implies that TIs are widely perceived as successful and reliable custodians of water security in Mambu-Bafut.

Results show that most participants "disagree" or "neutral" that these traditional institutions have provided technicians for improved water supply (mean score of 2.30 and standard deviation of 1.216). This implies that without localised technical assistance, basic wear-and-tear or minor mechanical issues can result in long-term failure of water supplies in Mambu-Bafut.

Table 4: Functions of traditional institutions in water resource management in Mambu-Bafut

Items	Sample	Mean Score	Standard Deviation
Have provided technicians for a better water supply	50	2.30	1.147
Have made water treatment and storage a subject in community schools	50	2.36	1.258
Have facilitated the collection of water taxes in the village	50	2.64	1.241
Have provided good storage water forms	50	3.54	1.216
Total	50		

Source: Authors' calculations

4.2.4 Functions of Traditional Leaders in Water Resource Management in Mambu-Bafut

Table 5 revealed that most participants "strongly agree" that traditional leaders have instituted fines on those who throw waste into water

catchment areas (mean score of 4.50 and standard deviation of 0.614). This suggests that traditional leaders play an active, accepted role in local water governance and environmental policing in Mambu-Bafut.

The results further revealed that most participants “strongly agree” that these leaders should increase financial awareness of water management (mean score of 4.42 and standard deviation of 0.499). This suggests that participants feel that financial strategies and the true economic value of water are not being effectively communicated by current leadership in WRM in Mambu-Bafut.The findings indicate that most participants “agree” and “strongly agree” that water availability, quality, and cost should be raised (mean score of 3.94 and standard deviation of 1.202). This suggests that participants broadly feel that current water services need intervention, whether that means paying more to guarantee better quality/delivery, or improving infrastructure to make water more reliably available in Mambu-Bafut.

The results show that most participants “agree” and “strongly agree” that local leaders are playing an important role in building, operating, and maintaining water infrastructure (mean score of 3.94 and standard deviation of 1.202). This suggests that when participants believe their leaders are heavily committed to maintaining infrastructure, it fosters local cooperation, the willingness to pay for water services, and stronger community trust.

Data from field observation revealed that.

Mambu's traditional ruler has enclosed the area around the water sources and barred all human activity. Only trained water technicians are permitted to enter locations where cleaning, water treatment, or other management tasks are carried out. For example, in the “Asong” water catchment area, traditional leaders, particularly the "Fon", traditional council and the Kwifor, collaborate with local Non-Governmental Organisations (Agro-complex Farming Common Initiative Group (AGFAG), to promote sustainability through environmental conservation, education, and active participation (Plates 6 and 7). These programs demonstrate a collaborative approach in which traditional institutions and local leaders in Mambu-Bafut actively engage to manage water resources and promote community health (Field Observation, 2023).

Table 5: Functions of traditional leaders in water resource management in Mambu-Bafut

Items	Sample	Mean Scores	Standard Deviation
Raising awareness on water availability risks, quality and cost	50	4.32	.471
Building, operating, and maintaining wat infrastructure	50	3.94	1.202
Sensitisation on financial awareness in w management	50	4.42	.499
Fines should be paid by individuals who throw waste into water bodies	50	4.50	.614
Total	50		

Source: Authors’ calculations

5. DISCUSSION

The researchers evaluated the role of traditional leaders in water resource management in Mambu-Bafut, Cameroon. The study examined: traditional leaders' participation in water resource management in Mambu-Bafut, traditional institutions' participation in water resource management in Mambu-Bafut, traditional institutions' functions in water resource management in Mambu-Bafut, and traditional leaders' participation in water resource management in Mambu-Bafut.

Findings on traditional leaders' participation in the management of water resources in Mambu-Bafut revealed that they have created new laws and regulations, and provided water in various forms in some parts of the village. This means that traditional leadership is still a powerful, proactive force in rural water governance and community-based natural resource management in Manbu-Bafut. The findings supported those of Sulemana's (2013) research into the role of traditional authority in water resource management in Binaaba, Bawku West District. The study discovered that customary laws control water resource management. Traditional chiefs oversee all water-related matters. They were in charge of establishing the rules controlling water resources, defining specific areas around water sources, dealing with offenders, and resolving problems. They sometimes perform these tasks alongside the entire community. Traditional water management systems have also been shown to be quite effective in sustaining food production because everyone has access to water. The findings differ from those of Kapfudzaruwa and Sowman's (2009) study on whether there is a role for traditional governance systems in South Africa's new water management regime. The research findings show that both state and traditional governance systems are important for water resource management in the studied areas (Kapfudzaruwa & Sowman, 2009). However, the management of water resources is primarily led by state-driven policies that are founded on statutory legal frameworks (Kapfudzaruwa & Sowman, 2009). Traditional governance systems, including customary laws and cultural and religious traditions, play a significant role in helping water user groups achieve their goals (Kapfudzaruwa & Sowman, 2009). Failure to acknowledge and embrace features of these traditional governance systems may jeopardise the government's capacity to meet the goals of the National Water Act (Kapfudzaruwa & Sowman, 2009). Decentralisation theory distinguishes between deconcentration (delegating administrative powers to local branches of central government) and devolution (transferring true decision-making power to local actors). The Mambu-Bafut findings show a de facto devolution, with traditional leaders acting as autonomous managers rather than state agents.

Results on traditional institutions' participation in water resource management in Mambu-Bafut revealed that these institutions have established roles regarding fines for the discharge of water waste, have put in place committees to maintain water supply and have educated the villagers about water mismanagement and the penalties that must be paid. This suggests that

traditional punishments and fines are widely respected, serving as an extremely effective deterrent to pollution or mismanagement of shared water resources. These findings are consistent with those of Emiru's (2010) study on the role of traditional institutions in water resource governance in the Borana lowlands, southern Ethiopia. The findings revealed that the Borana water management system is a customary institution that ensures equal access to water (Emiru, 2010). *"Confi,"* the creator and overseer, *"Chora Ella,"* the management council, and *"Aba Herrega,"* the daily supervisor, comprise the three key parts of the management body (Emiru 2010), with clearly defined roles and obligations to ensure that water resources are used peacefully and in the long run. Decentralisation theory emphasises delegating decision-making, management, and regulatory functions from the central government to local stakeholders.

Results on the roles of traditional institutions in water resource management in Mambu-Bafut revealed that these institutions have provided good storage water forms. This indicates that traditional institutions (chiefs, traditional councils, and the kwifor) effectively enforce customary laws, maintain catchment areas, and establish seasonal restrictions to limit water depletion. These findings validated Bulengela's (2024) study on rethinking the role of institutions in water resource governance in Tanzania: What is still missing? demonstrates that these traditional and community-owned institutions ensure equitable use of water resources, reduce resource-based conflicts within and between pastoralist communities, and improve livestock development in the area. Regulation of seasonal water use and the ability to deal with recurring water shortages are further advantages (Bulengela, 2024). Decentralisation strengthens local communities while also enhancing sustainability, service delivery, and participation by shifting responsibility for water management from central authorities to local institutions.

Findings on the roles of traditional leaders in water resource management in Mambu-Bafut revealed that those who throw waste into water bodies should pay fines, that financial awareness of water management should be increased, and that water availability risks, quality, and cost should be raised, as well as building, operating, and maintaining water infrastructure. This implies that traditional authorities have the social power to implement protective water rules in Mambu-Bafut. The findings corroborate those of Osei and Asantewa (2025), who conducted a study on traditional leadership, indigenous knowledge, and environmental conservation in Ghana. A content analysis. Their findings demonstrated that traditional authorities, including chiefs, clan heads, and traditional priests, serve as custodians and agents of indigenous knowledge, playing a critical role in enforcing natural resource management techniques in indigenous cultures like Ghana (Osei & Asantewa, 2025). Decentralisation theory, as applied to Mambu-Bafut, enables traditional leaders to act as local water stewards, transitioning from customary oversight to proactive management. Sustainable water management in Mambu-Bafut involves the integration of traditional methods with modern approaches, as well as enough financial resources and enhanced institutional coordination.

6. CONCLUSION

Traditional leaders and institutions continue to be active in the Mambu-Bafut water resource management practices. Traditional leaders' participation in water resource management in Mambu-Bafut has established new laws and regulations, and provided water in various forms in some parts of the village. Traditional institutions in Mambu-Bafut have created committees to maintain the water supply, established roles for fines for water waste discharge, and educated villagers about water mismanagement and its consequences. Traditional institutions have provided suitable water storage forms in Mambu-Bafut, while traditional leaders in water resource management in Mambu-Bafut have facilitated sanctions (financial fines) for those who throw waste into water catchment areas, increased financial awareness in water management in Mambu-Bafut, and raised water availability risks, quality, and cost among community members, as well as building, operating, and maintaining water infrastructure. The study highlights the relevance of traditional leaders' governance in managing water resources in Manbu-Bafut to alleviate water scarcity, increase efficiency, and promote equity in the community.

7. LIMITATIONS AND FURTHER RESEARCH

Evaluating the role of traditional leaders in water resource management in Mambu-Bafut, Cameroon, using a descriptive, exploratory approach and a small sample of 50 participants, has major generalisability concerns. A sample of 50 participants does not have the statistical capacity to represent the entire population of Mambu-Bafut, much less the Northwest Region of Cameroon. We recommend that more research be conducted in a different community, with a mixed approach and a larger sample size, in order to generalise the findings nationally and globally.

Descriptive analysis focuses on what is happening, but it cannot demonstrate cause-and-effect linkages. For example, evidence may reveal that traditional leaders enforce water catchment protection, but this does not establish that their leadership is the only cause of improved water quality. According to the findings, the study should be conducted in another community utilising the Propensity Score Matching (PSM) technique. This statistical technique generates extremely comparable groups. You can compare catchments governed by traditional leaders to similar catchments without traditional leadership. This isolates the "leadership" variable, demonstrating its direct impact. Again, Participatory Action Research (PAR) should be performed with direct participation from community representatives and traditional structures in order to benchmark local knowledge and governance structures within catchment management plans. This will guarantee that catchment management plans are inclusive, realistic, and sensitive to indigenous knowledge and current customary water tenure.

The study's findings cannot be applied outside the study context since the limited sample size of 50 traditional council members limits

generalisability, due to cultural differences and dual government systems. Relying on only 50 traditional council members is statistically insufficient to represent the entire population. Such a tiny sample size risks introducing sampling bias and failing to capture the different experiences of the larger community. The study suggests that another study be conducted with a bigger sample size to improve generalisability beyond the particular context.

The study's purposive and institutionally restricted sample of 50 traditional council members in Mambu-Bafut is limited by intrinsic biases, statistical reliability constraints, and the exclusion of critical marginalised perspectives in Community-Based Water Resource Management. Purposive sampling focuses on those in recognised roles, which might bias data toward maintaining the status quo and official institutional narratives rather than documenting objective, ground-level reality. The sample is limited to council members, which automatically marginalises the experiences of women, youth, and non-titled citizens in Mambu-Bafut water resource management. This group of individuals are frequently the major water managers and collectors at the household level. Focusing primarily on traditional leadership misses the important roles played by other overlapping stakeholders, such as formal city councils, Village Development Associations (VDAs), and Water Management Committees (WMCs). The report suggests that a study be conducted with all community members and stakeholders in another community.

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