Quantifying Perception of Water Governance in Lethem Guyana Implications for Improved Water Services in the Community

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Abstract

This study examines community perceptions of water governance in Lethem, Guyana, with a focus on equity, access, and stakeholder inclusion. Using a survey of 377 residents, the research reveals generally positive views on fairness and collaboration but also highlights concerns about gender equity and the prioritization of vulnerable groups. The findings emphasize the importance of transparent, participatory, and culturally responsive governance systems. They also underscore the need to strengthen institutional mechanisms and visibility of inclusive policies to build public trust and improve water governance outcomes in hinterland communities. Policy implications are discussed for more effective, inclusive water resource management.

Keywords: Access, Equity, Governance Framework, Stakeholders, Water Governance.

Introduction

Water governance is a crucial topic worldwide, particularly in poor countries where water availability, sustainability, and equity are still substantial challenges [17]. Effective water governance entails managing water resources in ways that achieve fair distribution, environmental sustainability, and institutional transparency [4].

However, in many hinterland communities, governance processes frequently fail to address local water concerns due to characteristics like as low institutional trust, lack of transparency, and low stakeholder participation [17].

In Lethem, a town in Guyana's hinterland region, community people' opinions of water governance effectiveness are influenced by a variety of factors, including institutional trust, policy transparency, and socioeconomic and geographical conditions. Hinterland communities frequently confront specific governance problems, such as infrastructure deficits and policy implementation gaps, escalating community concerns about water supply and sustainability. Notwithstanding this, the Government of Guyana has targeted to achieve the provision of water for all in the Hinterland by the end of 2025. A strategic plan has been developed and is being implemented by Guyana Water Incorporated, the public utility company, to achieve this target. This plan is being implemented for the period 2021 to 2025.

Literature Review

Governance Frameworks in Water Management

Several studies have examined and reported on the significance of robust governance frameworks which can be adopted for sustainable management of water resources. According to [16], the polycentric governance framework emphasizes a distributed approach to governance where decision making is vested

in multiple parties operating independently but interacting within a system of mutual accountability. This model is different from centralize approach to governance because it allows for the distributions of decision-making powers and authority amongst several capable actors, including responsible government agencies, local communities, and private stakeholders [16]. This approach to governance allows for a more agile and adaptable approach to managing issues with complex policy dynamics [4]. Regarding water governance, the polycentric governance approach allows for multiple institutions to collaborate on the management of water resources [17]. However, even though this model promotes adaptability and stakeholder participation, [9], points to challenges such as coordination difficulties and power imbalances among key players as some of the hinderances to the effective implementation of the model.

Research has shown that the polycentric governance model can be applied to the management of water resources in a variety of settings. In their analysis of European water governance systems, for example, [17] discovered that polycentric arrangements improve adaptive capability by encouraging stakeholder participation and cross-sector collaboration. The governance of groundwater resources in Spain was also examined by [20], who found that polycentric arrangements promoted better sustainable water management by dividing up decision-making power between local and regional organizations. However, [6], emphasized issues like unequal power dynamics and dispersed duties in a study on South African water administration, which can compromise the effectiveness of polycentric governance. These results imply that although polycentric governance may be beneficial for managing water resources, its effectiveness hinges on efficient coordination systems and fair stakeholder involvement.

In their study of OECD governance models, [1] discovered that Integrated Water Resource Management (IWRM) strategies are essential for improving policy coordination and attaining sustainable water governance. IWRM is a comprehensive governance framework that encourages the integrated use and management of land, water, and associated resources to optimize social and economic well-being while maintaining the sustainability of important ecosystems [7].

A central tenet of IWRM is that it promotes collaboration among many sectors—such as agriculture, industry, and environmental agencies—ensuring that water policies are consistent with overarching socio-economic and environmental goals [7]. Inline with this principle, [1], study found that nations with decentralized governance systems typically execute IWRM more successfully because of their ability to account for local knowledge and demands while preserving the coherence of national policies. The findings demonstrated how IWRM principles, when paired with polycentric governance structures, promote more flexible and inclusive decision-making procedures.

However, [1] also noted that division among institutions and governance complexity may pose problems with implementation, regardless of IWRM contribution to enhance coordination and sustainability. For instance, in many OECD nations, conflicts over resource allocation, inefficiencies, and misaligned policies have resulted from the overlap of duties among water authorities, environmental agencies, and local governments.

Furthermore, effective stakeholder participation, financial sustainability, and the capacity to incorporate traditional and scientific knowledge into decision-making are all necessary for IWRM to succeed in polycentric governance systems [17] Countries that have effectively adopted IWRM, for example, the Netherlands and Denmark, show that effective governance and long-term water security can be improved by robust regulatory frameworks,

stakeholder participation, and adaptive management techniques [15].

These findings reinforce the premise that, notwithstanding their complementary nature, polycentric governance and IWRM require the institutional strength, political will, and regulatory coherence of the governing organizations in question to be effective.

Effective water governance is generally acknowledged to be based on the collaboration of many stakeholders, including governments, local communities, business entities, and civil society organizations. Research [12] that participatory governance strengthens the legitimacy, equality, and sustainability of water management systems in addition to improving decision-making processes.

Ensuring fair access to water resources and empowering underprivileged communities are two of the strongest justifications for stakeholder participation.

Ensuring fair access to water resources and empowering underprivileged communities to engage meaningfully in water governance issues are two of the strongest justifications for stakeholder participation in this process. For example, [12] found that decentralized, participatory models greatly enhanced water availability and sustainability in their study of community-led water governance structures in India. By using traditional knowledge and methods to address local issues, these frameworks gave local populations the ability to take charge of decisions about water management. Equally, [3] emphasize the successful outcomes of indigenous-led water efforts in the region of Latin America, where participatory frameworks enhanced resource sustainability and strengthened cultural identity and resilience. These findings emphasize the necessity of customizing governance systems to align with local requirements and contexts, especially in areas such as Guyana's hinterland, where indigenous populations are pivotal in managing communal water resources.

Participatory governance is crucial in conflict resolution, especially in areas with conflicting water needs or transboundary issues. Researchers [10], for instance, looked at transboundary water governance systems in shared river basins and emphasized how inclusive stakeholder participation encourages collaboration and confidence between parties in dispute.

Similarly, [18] discovered that social learning—a process whereby stakeholders jointly generate new ideas and solutions—was enabled by stakeholder participation in the UK water the sector. In addition to decreasing conflicts, this cooperative approach improved policy adoption and compliance.

In Lethem, Guyana, where cross-border interactions with Brazil affect water governance, participatory frameworks may alleviate tensions and foster collective accountability for sustainable resource management.

Notwithstanding its benefits, stakeholder participation presents certain problems. Unequal power dynamics frequently compromise the efficacy of participatory processes, especially in areas with established institutional hierarchies. Researchers such as [14] suggest that tokenistic participation—where stakeholders are seemingly engaged without substantial influence—can intensify existing inequities and undermine trust in governance institutions.

Water governance systems rely on regulatory mechanisms that guarantee their effectiveness, as they create the legal and institutional frameworks needed for sustainable water resource management. These mechanisms include a variety of tools, such as laws, enforcement measures, market-based instruments, and policy frameworks, each of which has a significant impact on stakeholder behavior and resource outcomes. Empirical evidence from various regions underscores the successes and limitations of regulatory

frameworks in attaining water governance objectives.

Another researcher [2] examined Canada's laws and regulations related to water governance and found that robust enforcement and open policies were important factors in promoting better conservation and compliance. For example, the adoption of transparent water distribution guidelines and strong monitoring systems made sure that all parties involved followed sustainable usage guidelines. Transparency in policy design also promoted responsibility and trust among stakeholders by openly sharing goals, decision-making procedures, and results.

In a similar vein, [9] showed that open regulatory frameworks in Europe increased public trust in governance structures, which in turn increased levels of compliance and collaboration. These findings emphasize the critical importance of creating regulatory systems that are both enforceable and acknowledged as legitimate and equitable by stakeholders.

On the other hand, shortcomings in governance and water mismanagement are frequently linked to inadequate regulatory enforcement, especially in regions with inadequate institutional capacity. An empirical analysis of water governance in sub-Saharan Africa was conducted by [13] who found that efforts to address water scarcity and contamination were undermined by fragmented regulatory frameworks and inconsistent enforcement. Similarly, [19] underscored the fact that decentralization reforms in Africa frequently failed because of deficient institutional oversight, which left local governments unable to successfully carry out regulatory policies. These studies highlight the urgent need for effective enforcement mechanisms to guarantee that regulatory frameworks bring about concrete outcomes.

In Guyana's hinterland, where cross-border activities with Brazil influence water governance, regulatory frameworks must balance national sovereignty with regional collaboration to ensure sustainable resource management.

Methodology

The purpose of this research is to examine the factors influencing stakeholders' perception of the effectiveness of water governance in Lethem, a small town located in region 9, upper Takutu-upper Essequibo, in Guyana. A quantitative survey design was employed to collect and analyze the data. According to [5] "a survey design provides a quantitative description of trends, attitudes, and opinions of a population, or tests for associations among variables of a population, by studying a sample of that population" (p.241). Given the nature of this study, two interrelated analyses were considered – descriptive analysis, where varying characteristics, patters and trends in study population's perceptions were observed, and correlational analysis where relationships between variables were examined without any manipulation [5, 21].

The population of this study is the members of the Lethem community located in the hinterland region # 9 in Guyana. According to the information received from the Regional Democratic Council (RDC), the current population stands at an estimate of about 3000 persons. Officially, however, there has not been an official census and documentation of the population since 2012, when the population was 1,489 [8]. Given the gap since the last population census, it was appropriate to consider the estimated 3000 number provided by the Regional Democratic Council. With regard to the sample size, [21] argues that "the sample size for both the quantitative and qualitative components needs to balance comprehensiveness with feasibility, ensuring enough data is collected to achieve statistical power and depth of insight while considering constraints such as time and resources" (p.53). Given the estimated population of 3000 persons, to get the sample size for a 95%

confidence level and 5% margin of error you a sample size of 341 respondents was calculated.

The objective of this study was to garner community members views about the state of water governance. In to address this objective, one overarching question was explored:

1. How do community members perceive the effectiveness of water governance in terms of equity and access?

A10 items, 5-points, Likert Scale questionnaire was developed and distributed to collect the relevant data to address these questions. The questionnaire items were drawn from several studies based on a rigorous and systematic review of the literature, including similar studies [2] related to water governance in hinterland or rural communities.

Results

An examination of community perceptions around equity and access in water governance reveals a generally favourable outlook, but with underlying concerns that warrant attention. Responses to the statement on equitable access

to clean water (Q1) indicate that 73% of respondents either agree or strongly agree that all residents have fair access. However, 11.1% express disagreement, and a further 15.9% remain neutral. This distribution suggests that while the majority perceive the system as equitable, a meaningful minority either experience or perceive disparities in access. The relatively high neutrality also points to possible gaps in awareness or inconsistencies in service delivery.

Similar patterns emerge in responses to whether the governance system prioritizes vulnerable groups such as low-income households and indigenous communities (Q4). Here, 67.3% of respondents agree or strongly agree that such prioritization exists, yet 11.4% disagree and a notable 21.2% are neutral. This substantial neutrality suggests a lack of visibility or clarity regarding the targeting and effectiveness of inclusive policies. It may also reflect skepticism about whether stated commitments to equity are meaningfully enacted at the local level.

Table 1. Perceptions of Equity and Vulnerability in Water Governance (n=377)

Questionnaire Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
11. My socioeconomic status (e.g., income, education) influences my ability to benefit from water governance initiatives.	6.1%	13.8%	21.5%	43.0%	15.6%
4. The water governance system in my community prioritizes the needs of vulnerable groups (e.g., low-income households, indigenous communities).	4.0%	7.4%	21.2%	44.0%	23.3%
1. The current water governance system in my community ensures equitable access to clean water for all residents.	4.5%	6.6%	15.9%	52.3%	20.7%

Note: Data derived from the researcher's field survey conducted in, Lethem, Guyana [21]

The responses to the influence of socioeconomic status on individuals' ability to benefit from governance initiatives (Q11) further complicate the picture. A majority—58.6%—agree or strongly agree that income,

education, and other socioeconomic factors shape their access to water governance benefits. This implies that despite broad perceptions of fairness, systemic inequalities still play a significant role in determining who truly

benefits from governance structures. Notably, 19.9% of respondents disagree with this assertion, possibly reflecting either divergent personal experiences or a belief that the system operates independently of socioeconomic status.

Collectively, these findings highlight a tension between the perceived intent of equity in governance and the lived reality of access and inclusion. While many community members affirm the fairness of the current system, the high rates of neutrality and the acknowledgment of socioeconomic influence point to persistent structural inequities and communication challenges. These insights suggest that while progress has been made, there is a need for more transparent, targeted, and participatory approaches to ensure that vulnerable groups are not only acknowledged in policy but meaningfully included in practice.

Effective and equitable water governance depends not only on technical capacity and institutional effectiveness but also on the degree to which governance processes are inclusive, participatory, and culturally responsive. This section analyses four indicators that capture perceptions of stakeholder collaboration (Q14), the integration of indigenous knowledge (Q16), inclusiveness of diverse groups (Q20), and attention to gender equality in decision-making (Q21). These measures reflect the social dimensions of governance and provide insight into how communities experience inclusivity and cultural sensitivity in water-related policies and practices.

Perceptions of stakeholder collaboration (Q14) are highly favourable, with 73.2% of respondents agreeing or strongly agreeing that collaboration among actors such as government agencies, NGOs, and the private sector improves water governance outcomes. Only 8.2% expressed disagreement, while 18.6% were neutral. These findings underscore a strong belief in the value of multi-stakeholder approaches, suggesting public support for cross-sector partnerships and coordinated governance. The moderate neutrality rate may reflect limited visibility of these collaborations in practice, but overall, the data points to a perceived benefit from collaborative governance models.

The role of indigenous knowledge in enhancing water governance effectiveness (Q16) is also viewed positively, with 70.1% of respondents agreeing or strongly agreeing. While disagreement is low at 6.6%, 23.3% are neutral, indicating some uncertainty or limited awareness about how indigenous practices are integrated into formal governance structures. This neutrality suggests an opportunity for greater visibility and institutional support for indigenous knowledge systems, which are often locally grounded and sustainable.

Inclusiveness of diverse stakeholder groups—including women, youth, and ethnic minorities (Q20)—received 68.7% agreement overall. Yet, 22.5% of respondents remained neutral, and nearly 9% disagreed. While the overall sentiment is encouraging, the relatively high neutrality may signal that inclusion is not always visible or experienced equally across the community, particularly among underrepresented groups. This points to a need for stronger outreach and engagement efforts to ensure that diverse voices are not only represented but empowered in decision-making spaces.

Table 2. Selected Indicators of Inclusion, Collaboration, and Equity in Water Governance (n=377)

Questionnaire Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
14. I believe that collaboration between local stakeholders (e.g., government, NGOs, private sector) improves water governance outcomes.	2.4%	5.8%	18.6%	50.1%	23.1%
16. The involvement of indigenous knowledge and practices enhances the effectiveness of water governance initiatives.	1.3%	5.3%	23.3%	48.3%	21.8%
20. I feel that water governance initiatives in my community are inclusive of diverse stakeholder groups (e.g., women, youth, ethnic minorities).	3.2%	5.6%	22.5%	49.1%	19.6%
21. Gender equality is adequately considered in water governance decision-making processes in my community.	3.7%	10.3%	33.7%	32.4%	19.9%

Note: Data derived from the researcher's field survey conducted in, Lethem, Guyana [21]

Perceptions of gender equality in water governance decision-making (Q21) were notably more mixed. Only 52.3% of respondents agreed or strongly agreed that gender equality is adequately considered. A substantial 33.7% were neutral—the highest neutrality rate among the items analysed—and 14% disagreed. This indicates a significant degree of uncertainty or skepticism about the extent to which gender equity is meaningfully embedded in governance processes. The relatively lower agreement levels compared to other inclusion-related items suggest that while progress may have been made, gender-responsive approaches remain insufficiently institutionalized or visible.

Discussion

The findings of this study underscore the complex and multidimensional nature of water governance in Lethem, revealing both positive public perceptions and persistent structural challenges. A majority of respondents expressed confidence in the fairness of water access and the collaborative efforts of stakeholders. However, significant neutrality and disagreement on questions related to equity, inclusion, and gender-responsive governance suggest underlying gaps in visibility, engagement, and policy execution.

The high level of agreement (73%) regarding equitable access to clean water mirrors global patterns where decentralized and participatory water management systems tend to yield favourable equity outcomes. For example, [12] demonstrated that participatory governance frameworks in India led to enhanced accessibility and sustainability by empowering local communities to contribute to water-related decisions. Their findings highlight the importance of inclusivity and visibility of governance efforts in improving stakeholder perceptions and service outcomes.

Yet, the substantial proportion of neutral responses—particularly regarding the

prioritization of vulnerable groups and gender equality—points to a persistent disconnect between policy intentions and community experiences. This aligns with [14] who found that tokenistic stakeholder participation in rural South Asia frequently leads to disillusionment, especially among marginalized groups, when their involvement does not translate into real influence or visible outcomes. The Lethem data suggest that similar dynamics may be at play, with respondents uncertain about the practical integration of equity-focused measures, such as gender representation or indigenous knowledge systems.

The study also found strong support for stakeholder collaboration (73.2%), echoing earlier research that demonstrates the positive relationship between multi-actor partnerships and effective water governance. One study [18] emphasized that stakeholder collaboration enhances policy compliance, fosters shared ownership of resources, and strengthens the legitimacy of governance systems. They observed that inclusive dialogue and joint learning processes enable the development of context-sensitive solutions and improve outcomes across social and environmental indicators.

Moreover, the recognition of indigenous knowledge (70.1%) as a contributing factor to governance effectiveness underscores the potential of integrating traditional ecological wisdom into formal systems. Another study [3] that indigenous water governance in Latin America improved ecological outcomes while reinforcing cultural identity and institutional trust. However, they caution that the institutionalization of such knowledge requires deliberate policy frameworks and power-sharing mechanisms to avoid marginalization.

Perhaps most revealing is the mixed perception regarding gender equality, where only 52.3% of respondents agreed it was adequately considered. This result reflects a broader global challenge. According to the [15] water governance frameworks often fail to integrate gender considerations in meaningful ways, leading to policies that overlook the unique vulnerabilities and contributions of women in water resource management. The findings suggest that while some progress has been made in Lethem, institutional mechanisms to ensure gender equity remain underdeveloped or insufficiently visible.

Taken together, the findings highlight a partial alignment between global best practices in participatory water governance and the lived experiences of Lethem residents. While perceptions are generally positive, sustained improvements in governance legitimacy will depend on increased transparency, better communication of policy objectives, stronger equity mechanisms, and continued support for inclusive, cross-sectoral engagement. These measures are essential not only to improve stakeholder trust but to ensure that governance reforms translate into tangible outcomes for all community members.

The findings also have several implications for improving water governance practices in Lethem, and by extension other hinterland communities in Guyana. First it provides the groundwork for policies and practices focused on instituting water governance mechanism and systems that facilitates inclusive multi-stakeholder dialogue and an agenda for collective action to accelerate impact. Second, providing educational programs to raise awareness about water related issues such as water scarcity, effective use of water, water preservation and sustainability, and sustainable use of water resources can serve as an actionable undertaking to improve perception, participation and sustainable water governance across communities.

Conclusion

In conclusion, this research emphasizes that although Lethem community members usually view water governance as fair and cooperative, notable disparities still exist in the visibility and execution of equity-focused initiatives,

particularly with respect to gender inclusion and the prioritization of vulnerable populations. While the results imply that governance systems are heading in the right direction, continuous improvements will be needed for more open communication, closer integration of indigenous knowledge, and institutional structures that empower many stakeholders. Dealing with these deficiencies can improve the legitimacy of government, encourage inclusive decision-making, and help more resilient and sustainable water management results in Lethem and other hinterland areas.

Conflict of Interest

The author declares that there is no conflict of interest related to the research and publication of this study.

References

[1]. Akhmouch, A., & Correia, F. N., 2016. The 12 OECD principles on water governance: When science meets policy. *Utilities Policy*, 43, 14–20. https://doi.org/10.1016/j.jup.2016.06.004m

[2]. Bakker, K., & Morinville, C., 2013. The governance dimensions of water security: A review. *Philosophical Transactions of the Royal Society A*, 371(2002), 20130116. https://doi.org/10.1098/rsta.2013.0116

[3]. Boelens, R., Hoogesteger, J., Swyngedouw, E., Vos, J., & Wester, P., 2016. Hydrosocial territories: A political ecology perspective. *Water International*, 41(1), 1–14. https://doi.org/10.1080/02508060.2016.1134898

[4]. Carlisle, K., & Gruby, R. L., 2019. Polycentric systems of governance: A theoretical model for the commons. *Policy Studies Journal*, 47(4), 927–952. https://doi.org/10.1111/psj.12212

[5]. Creswell, J. W., & Creswell, J. D., 2018. Research Design: Qualitative, Quantitative, and Mixed Methods Approaches (5th ed.). *Sage Publications*.

[6]. Faguet, J. P., 2014. Decentralization and governance in water management: Evidence from Africa. *Development Policy Review*, 32(2), 151–172. https://doi.org/10.1016/j.worlddev.2013.01.002

[7]. Global Water Partnership (GWP)., 2000. Integrated Water Resources Management. *TAC Background* Paper No. 4. Stockholm, Sweden. https://www.gwp.org

[8]. Guyana Bureau of Statistics. 2012. Population and Housing Census: Region 9 - Upper Takutu-Upper Essequibo. Retrieved from https://statisticsguyana.gov.gy/

[9]. Huitema, D., & Meijerink, S., 2017. The politics of river basin organizations: Institutional design choices, coalitions, and consequences. *Ecology and Society*, 22, 42. https://doi.org/10.5751/ES-09409-220242

[10]. Jarvis, W. T., Giordano, M., & Wolf, A. T., 2016. Assessing transboundary water governance. *International Journal of Water Resources Development*, 32(5), 681–695.

[11]. Mehta, L., Allouche, J., Nicol, A., & Walnycki, A., 2019. New water governance: Critiques and challenges. *World Development*, 120, 134–148. https://doi.org/10.1016/j.worlddev.2019.104588

[12]. Mehta, L., Derman, B., & Manzungu, E., 2017. Flows and practices: The politics of integrated water resources management in Eastern and Southern Africa. *Routledge*.

[13]. Mollinga, P. P., 2010. Boundary work and the complexity of natural resources management. *Crop Science*, 50(Supplement 1), S-1–S-9. https://doi.org/10.2135/cropsci2009.10.0570

[14]. Mukherji, A., Scott, C., Molden, D., & Maharjan, A., 2018. Megatrends in Hindu Kush Himalaya: Climate change, urbanisation and migration and their implications for water, energy and food. In A. Biswas, C., Tortajada, & P., Rohner

(Eds.), Assessing Global Water Megatrends Water Resources Development and Management. *Springer*, Singapore. https://doi.org/10.1007/978-981-10-6695-5_8

[15]. OECD. 2015. Water Governance in OECD Countries: A Multi-Level Approach. *Organisation for Economic Co-operation and Development Publishing*. https://www.oecd.org/water

[16]. Ostrom, E., 1990. Governing the Commons: The Evolution of Institutions for Collective Action. *Cambridge University Press*.

[17]. Pahl-Wostl, C., Holtz, G., Kastens, B., & Knieper, C., 2010. Analyzing complex water governance regimes: The management and transition framework. *Environmental Science & Policy*, 13(7), 571–581. https://doi.org/10.1016/j.envsci.2010.08.006

[18]. Reed, M. S., Vella, S., Challies, E., de Vente, J., Frewer, L., Hohenwallner-Ries, D., Huber, T., Neumann, R. K., Oughton, E. A., Sidoli del Ceno, J., & van Delden, H., 2018. A theory of participation: What makes stakeholder and public engagement in environmental management work? *Restoration Ecology*, 26(S1), S7–S17. https://doi.org/10.1111/rec.12541

[19]. Ribot, J. C., Agrawal, A., & Larson, A. M., 2006. Recentralizing while decentralizing: How national governments reappropriate forest resources. *World Development*, 34(11), 1864–1886. https://doi.org/10.1016/j.worlddev.2005.11.001

[20]. Thiel, A., Mukhtarov, F., & Zikos, D., 2019. Governing beyond markets and states: Polycentric water governance. *Water Alternatives*, 12(2), 1–20. http://www.water-alternatives.org

[21]. Williams, M., Wiggins, R., Vogt, W. P., & Vogt, P. R., 2022. Beginning Quantitative Research. *SAGE Publications*.