

Legal Frameworks for Equitable Water Governance: Strengthening Policy Mechanisms for Sustainable Water Access and Rights

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ABSTRACT:

Equitable access to safe drinking water remains a critical global challenge, despite significant progress in expanding basic water services. This study examines the role of legal frameworks and governance structures in shaping sustainable and equitable water access outcomes. A mixed-methods approach is adopted, combining quantitative analysis of secondary data from the WHO/UNICEF Joint Monitoring Programme (JMP) dataset (2000–2024) with qualitative classification of legal and governance frameworks across six countries: South Africa, Germany, India, Brazil, Ethiopia, and Bangladesh. The findings reveal that while basic drinking-water access is relatively high in several countries, safely managed access and rural–urban equity remain uneven. Countries with strong governance systems, such as Germany, demonstrate near-universal access and minimal disparities, whereas countries with weaker governance contexts, such as Ethiopia, exhibit low access levels and significant inequalities. Moderate governance systems, including India and Brazil, show improvements in coverage but persistent gaps in service quality and distribution. The results highlight that legal recognition of water rights alone is insufficient to ensure equitable outcomes. Effective governance, including institutional capacity, regulatory enforcement, and coordinated policy mechanisms, is essential for translating legal frameworks into

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sustainable water access. The study emphasizes the need for equity-focused monitoring and strengthened policy implementation to achieve Sustainable Development Goal 6.

Keywords: Water governance; Right to water; Safely managed drinking water; Rural–urban inequality; SDG 6; Policy frameworks.

1. Introduction

The availability of safe and adequate water is among the most urgent developmental issues in the world today, and there are serious consequences on human health, economic productivity, and environmental sustainability. In spite of the long-term policy efforts and global commitments, water access inequalities continue to exist in and between countries, especially between urban and rural groups. Global water crisis is not only an issue of physical shortage but is gradually becoming a governance issue influenced by institutional capacities, policy integration, and legal frameworks (Koncagul & Connor, 2023). Equity and sustainability of water access then means that in addition to infrastructural development, there must be strong governance frameworks that would guarantee equitable distribution and accountability.

Recognizing water as a human right has enhanced the normative foundation of policy interventions, though its translation into universal access is not even. According to recent world evaluations, although considerable progress has been achieved in the expansion of the basic drinking-water services, the access to safe-managed water, which consists of quality, reliability, and accessibility, is still low among a large part of the population (World Health Organization, 2024). WHO/UNICEF Joint Monitoring Programme also underscores the ongoing disparities in access by country and population group and the necessity to implement governance strategies that focus on coverage and equity (WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene, 2025).

Equitable water governance has also been a challenge due to unequal water quality monitoring and service reliability, especially in the low and middle-income countries. Research has indicated that water surveys at the national level tend to highlight both a lot of gaps in the safety and quality of water, even where access is stated to be available (Bain et al., 2021). This shows that access conventional measures might hide the underlying governance problems of regulation, enforcement and service delivery. Besides, the financial and infrastructural needs to realize universal water access are considerable, as it is estimated that to achieve global water and sanitation goals, it is necessary to make long-term investments and allocate resources effectively (Hutton and Varughese, 2016).

Water governance is a political game and entails conflicting interests, institutional fragmentation and power relations that influence the distribution and access to resources. The governance structures should thus deal with the problems of participation, accountability, and coordination on different levels of decision-making (Rogers and Crow-Miller, 2017; Zwarteveen et al., 2017). OECD principles on water governance highlight that the key to sustainable water performance is the clarity of roles, stakeholder involvement and coherence of policies (Akmouch et al., 2018). Nevertheless, the issue of implementation continues to be problematic especially when operating in an environment with a low institutional capacity or enforcement tools.

Water governance dynamics are also complicated by urbanization and rural development. The high rate of urbanization subjects water infrastructure and service delivery system to more pressure, which in most cases generates disparities in the

accessibility of these systems in cities (UN-Habitat, 2020). Meanwhile, the rural population remains structurally disadvantaged because of poor infrastructure, geographic isolation, and decreased rates of investments (Canton, 2021). Such inequalities underscore the importance of governance systems that can be sensitive to spatial and socio-economic inequalities.

Water governance is also significantly connected with the larger development processes, such as agricultural transformation and rural livelihoods. A large percentage of the world population is agrarian and consequently water resources are vital to agriculture (Lowder et al., 2016). Water access and water management can thus be improved to achieve poverty reduction and sustainable development (Christiaensen & Martin, 2018). Moreover, sustainable water consumption is needed to sustain viable agricultural systems and long-term environmental sustainability (Pretty et al., 2018).

Legal systems in this regard are important to establish water rights, control distribution and accountability. Nevertheless, the success of these frameworks is determined by how they are incorporated with policy mechanisms and governance structures that have the ability to convert law recognition to practice. This study looks at the role of legal structures and governance regimes in promoting equitable access to water in the sampled countries, and specifically the relationship between institutional structures and quantifiable access and equity results. The objectives of the study are:

- To assess cross-country drinking-water access using JMP indicators.
- To analyze rural–urban disparities in safely managed drinking-water access.
- To classify selected countries based on legal and governance frameworks.
- To examine how governance strength relates to sustainable and equitable water access outcomes.

2. Materials and Methods

2.1 Research Design

This study applies a mixed-methods research design, which aims to integrate quantitative analysis of secondary data and qualitative legal and policy evaluation to explore the correlation between legal frameworks and fair water governance performance. The quantitative aspect is on the cross-country differences in drinking-water access and rural-urban differences, whereas the qualitative aspect examines the differences in legal recognition, policy frameworks, and capacity to enforce them. This combined method allows a thorough evaluation of the role of legal and institutional arrangements in determining the accessibility and fair allocation of water services.

2.2 Data Source

The data analysis is performed using secondary data in the WHO/UNICEF Joint Monitoring Programme (JMP) data, Drinking water, sanitation and hygiene in households by country, 2000-2024. JMP data gives internationally comparable estimates of access to drinking-water and are commonly used to monitor progress to Sustainable Development Goal (SDG) 6. It contains nationally representative data disaggregated by service level, by rural and urban population, thus providing access and equity measurements among countries.

2.3 Study Sample

Six countries; South Africa, Germany, India, Brazil, Ethiopia and Bangladesh were chosen as a purposive sample to ensure that the different countries have variation in legal structures, governance capacity and water access level. These nations are a variety of governance setting with some being well-institutionalized and well-recognized in law regarding water rights, and others being developing policies with insufficient enforcement. The choice enables comparative analysis in the different socio-economic conditions and governance.

2.4 Variables and Indicators

This study concentrates on important drinking-water access indicators. These are basic drinking-water access and safely managed drinking-water access on the national level, rural and urban

disaggregation of safely managed access. Moreover, the equity indicator is designed to reflect the inequalities in access to urban and rural populations. The urban-rural equity gap is determined as the difference between urban and rural access to safely managed drinking-water, in percentage points. This measure gives an indication of distributional inequality of water services among the countries.

2.5 Legal and Governance Framework Classification

The categorization of legal and governance systems was based on the principles of water governance and water law, and specifically those that underscore the importance of legal recognition, institutional coordination, policy coherence and enforcement capacity in the attainment of equitable water outcomes (Akmouch et al., 2018; Soininen et al., 2023). The existence and combination of these factors determined the classification of countries into strong, moderate, and weak governance structures. This is a method that enables a systematic comparison of the relationship between the difference in legal and institutional setups on one hand and the difference in water access and equity on the other.

2.6 Analytical Approach

3. Results

3.1 Legal framework classification for equitable water governance

Table 1. Legal framework classification for equitable water governance in selected countries

Country	Legal Recognition of Right to Water	Constitutional Status	Policy Framework Presence	Enforcement Capacity (General)	Overall Category
South Africa	Explicitly recognized	Yes (Constitutional)	Established	Relatively strong	Strong
Germany	Not explicit as a fundamental right	No explicit provision	Highly developed	Strong institutional systems	Strong
India	Implicit (judicial interpretation)	Not explicit	Established	Moderate with variability	Moderate
Brazil	Recognized in policy frameworks	Not clearly explicit	Established	Moderate	Moderate

The study uses a comparative analytical method that is descriptive to investigate patterns in different countries. The indicators of drinking-water access and equity disparity are compared to the chosen countries and understood within the framework of the governance classification in the chosen countries. The findings are summarized in tabular formats and graphically to show the differences in access levels and disparities. The analysis is aimed at finding relationships between the strength of governance and the observed outcomes, not on drawing causal relationships.

2.7 Limitations

There are some limitations to this study. Secondary data limits control over the data collection methodology and definition of indicators. Although it is based on legal and policy attributes that have been used to classify legal frameworks, the qualitative approach to classifying legal systems might not reflect all institutional complexities of a country. Moreover, national reporting systems and contextual factors might affect cross-country comparisons. Nevertheless, due to such shortcomings, the standardized JMP data allows consistency and comparability to ensure a solid analysis of global water access and equity.

Ethiopia	Recognized in policy documents	Limited clarity	Developing	Limited	Weak
Bangladesh	Recognized in policy frameworks	Not explicit	Developing	Limited to moderate	Weak–Moderate

Note: Classification is based on legal recognition of water rights, policy framework presence, and general enforcement capacity, following established water governance principles (Akmouch et al., 2018; Soininen et al., 2023).

Table 1 shows the legal and governance typology of the six countries selected. The classification will be made on the basis of legal acknowledgement of the right to water, constitutional, presence of policy framework, its enforcement capacity and strength of overall governance. South Africa and Germany are characterized as strong frameworks, which however represent alternative direction of governance. South Africa demonstrates clear constitutional acknowledgment of water rights and Germany demonstrates robust regulatory

and institutional frameworks even in the absence of a clear constitutional right to water.

India and Brazil are defined as moderate structures where there is legal or policy acknowledgement, but the implementation and enforcement is not fixed. Both Ethiopia and Bangladesh fall into weaker classes, which means that they are recognized on policies and have relatively lower enforcement. This categorization gives the law-governance foundation on which more robust frameworks are related to enhanced access and equity results.

3.2 Drinking-water access across selected countries

Table 2. Country-wise drinking-water access indicators, 2024

Country	Basic total %	Safely managed total %	Safely managed rural %	Safely managed urban %
South Africa	90.19	68.01	50.83	75.62
Germany	100.00	99.92	99.64	100.00
India	95.72	76.44	72.63	82.97
Brazil	100.00	88.62	73.64	90.66
Ethiopia	55.60	13.55	5.85	38.39
Bangladesh	98.78	59.13	62.51	54.31

Source: WHO/UNICEF Joint Monitoring Programme (JMP), Drinking water, sanitation and hygiene in households by country, 2000–2024.

Table 2 shows country drinking-water access indicators in 2024, such as basic access, safely

managed total access, of rural and urban disaggregation. In Germany, the safe access to drinking-water is almost universal at 99.92%, then Brazil at 88.62%, and India at 76.44%. In South Africa, it is at 68.01% and in Bangladesh, it is at 59.13%. Lowest safe access to drinking-water is in Ethiopia with 13.55%.

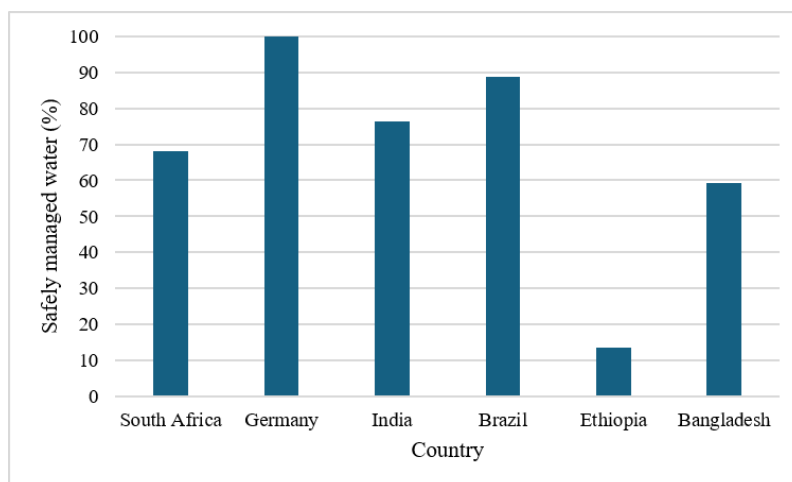


Figure 1. Safely managed drinking-water access by country

Figure 1 indicates that there is indeed a difference in access to safe drinking-water in the countries chosen. Germany and Brazil have the highest rates with the lowest rates being in Ethiopia.

These results indicate that national access results are significantly different in governance situations.

3.3 Urban–rural equity gaps in safely managed drinking-water access

Table 3. Urban–rural equity gap in drinking-water access, 2024

Country	Basic gap % points	Safely managed gap % points
South Africa	24.85	24.79
Germany	0.00	0.36
India	2.21	10.35
Brazil	0.00	17.03
Ethiopia	36.52	32.55
Bangladesh	-0.03	-8.20

Source: WHO/UNICEF Joint Monitoring Programme (JMP), Drinking water, sanitation and hygiene in households by country, 2000–2024.

Table 3 gives the urban-rural disparity in access to drinking-water. The difference is determined as the urban access less rural access. The highest safely managed access gap is registered in

Ethiopia of 32.55 percentage points, South Africa of 24.79 percentage points and Brazil of 17.03 percentage points. India has an average gap of 10.35 percentage points and Germany has a very small gap of 0.36 percentage points. The negative gap of Bangladesh is -8.20 percentage points, which implies that rural access safely managed is greater than urban access in the case of this indicator and year.

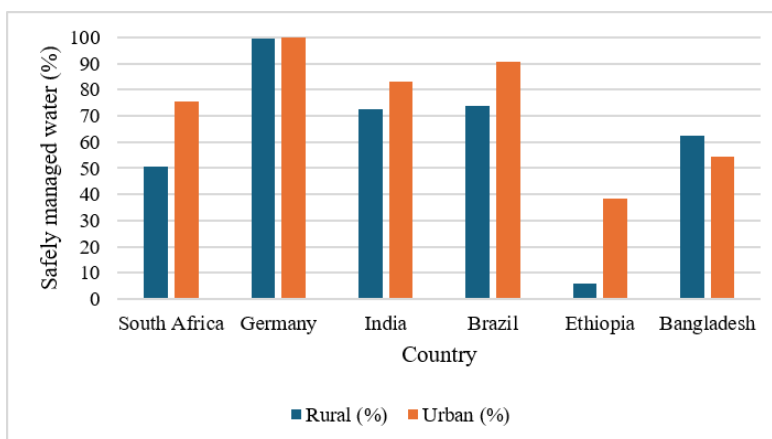


Figure 2. Rural and urban safely managed drinking-water access by country

Figure 2 contrasts rural and urban access to drinking-water that is safely managed. In South Africa, Germany, India, Brazil and Ethiopia there is high accessibility to urban areas as compared to

rural areas. The same is the opposite with Bangladesh, where rural access, which is safely managed, is greater than urban access.

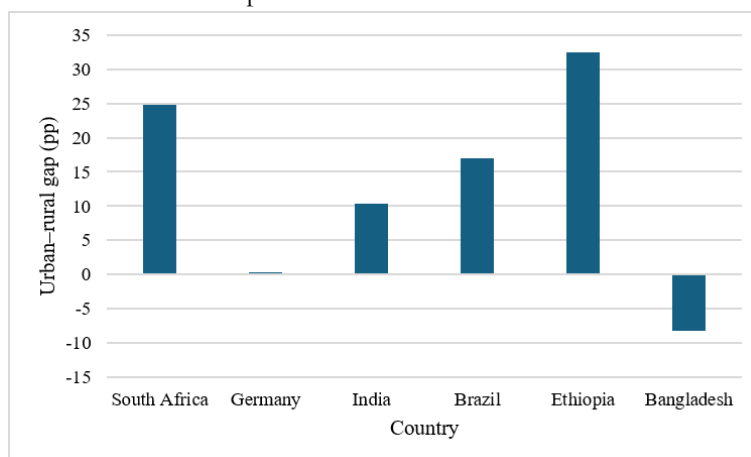


Figure 3. Urban-rural disparity in safely managed drinking-water access

The magnitude of safely managed water equity gap is shown in figure 3. The greatest difference is seen in Ethiopia, South Africa and Brazil. Germany demonstrates almost equal rural and urban access whereas Bangladesh depicts a negative difference. These findings imply that equitable water governance cannot be evaluated using coverage levels on a national level only. High basic access can be reported by countries but with lower safely managed access or high rural-urban inequalities. These results point at the necessity to reinforce legal and policy frameworks of sustainable access to and rights to water.

4. Discussion

The results of this study indicate that fair water governance is not only based on the official establishment of water rights, but also on the effectiveness of the policy frameworks, the institutional capacity, and the systems of implementation. The findings suggest that those countries that have more robust legal and governance systems tend to have higher levels of safely managed access to drinking-water and reduced urban-rural differences. It is not, however, a uniform relationship, and implies that recognition under law is not enough without reinforcement by the institutions of enforcement, the coordination of governance systems and the equity of service delivery mechanisms.

The best access outcome by the selected countries is in Germany where access to safe managed drinking-water is almost universal, and the rural-urban gap is low. The significance of this finding is that Germany is not a country where the right to water is explicitly acknowledged in the constitution; this important result is a manifestation of the power of the strong regulatory frameworks, coordination of the institutions, and proper governance of the public services. This substantiates the argument that the performance of governance influences equitable access to water as much as does legal recognition. Jimenez et al. (2020) also claim that water governance can be perceived as a practical dimension of accountability, coordination, participation, and capacity, instead of legal recognition.

The situation is different but equally significant to South Africa. It has specific constitutionalization of water rights but its safely managed water access and rural-urban equity performance is still lower compared with that of Germany. This implies that constitutional recognition is a strong normative base that cannot be assured to achieve equal access without uniform application. The South African case thus shows a fundamental issue with the rights-based water governance: the legal rights need to be converted into operative infrastructure, affordable services, monitoring, and redressing grievances. Soininen et al. (2023) point out that water law is most likely to be effective when it integrates rights, allocation, regulation and ecological sustainability in enforceable governance systems. The current results confirm this perspective, indicating that rights have to be actualized using definite policy processes.

India and Brazil are moderate in the analysis. Basic water access in both nations is comparatively high, yet the safeguarded access and equity achievement is unbalanced. This inherent difference between simple access and controlled access is an important aspect of policy interpretation. Basic access can mean physical access to water, whereas safely managed access

encompasses more standards in terms of quality, reliability, and safety. Hence, the advancement of basic coverage cannot be seen as the full water rights fulfilment. This observation is consistent with Romano and Akhmouch (2019), who state that modern water governance should go beyond the provision of infrastructure to integrated, stable, and accountable systems of services delivery, particularly in urban areas and rapidly urbanized locations.

The rural-urban gap that is observed in Brazil, India and South Africa shows that national level development may mask internal inequalities. This is especially so when it comes to the aspect of equitable governance in the article. A nation might seem to be doing well on a macro coverage but rural areas, peripheral urban areas, or the marginalized populations might still be receiving poorer quality services. In their review of water governance in Asian countries, Duc et al. (2024) emphasize that fragmented institutional arrangements, disparities in implementation, and a poor local capacity are still considerable obstacles to SDG 6 realization. This argument is backed by the current results, especially when referring to India and Bangladesh, where the legal and policy frameworks are in place, but the results of access are uneven among the population groups.

The level of safely managed drinking-water access in Ethiopia is lowest and the urban-rural gap in drinking-water access is greatest of the three selected countries. This is indicative of the effects of weak institutional ability and emerging governance structures. Although recognition of the policies might be present, the implementation of sustainable and equitable water services is limited. This result supports the larger research on governance literature, which recognizes the poor coordination, underfunding, inadequate infrastructure, and poor accountability as the main impediments to equitable access to water (Jimenez et al., 2020; Pichis-Garcia and Cueva-Rodriguez, 2026). In this case, institutional capacity and decentralized delivery of services

should be complemented by strengthening of the legal frameworks.

An interesting trend can be observed in Bangladesh, where the safely managed rural access surpasses the urban access in the data set. This reverse gap must not be seen as a complete equity or governance success. Rather, it indicates that the urban water governance can experience the pressures of the population density, informal settlements, the infrastructure strain, or water quality issues. The observation underscores the importance of context-specific analysis instead of assuming urban locales to be more frequently accessible. According to Romano and Akhmouch (2019), urban water governance is becoming more associated with challenges associated with demographic growth, the ageing of infrastructure, and inequality of services. The outcome of Bangladesh thus justifies the need to consider equity as not only a rural issue but also as an urban governance issue.

In the countries of the chosen countries, the findings affirm that equitable water governance entails the change of formal policy recognition to enforced and quantifiable outputs. Water must be established as a right or vital public service, which is spelt out by legal frameworks, but has to be backed by implementation, surveillance, funding, and responsibility mechanisms. Khamzayeva and Baikushikova (2024) argue that integrated water resources management is essential to reduce the gaps in governance and enhance the coordination of various sectors and institutions. On the same note, Varady et al. (2023) demonstrate that water governance can involve many actors, jurisdictions, and competing interests and coordination is the key to sustainable results.

The results also demonstrate relevance of equity sensitive indicators. When only basic access of a country is analyzed, then the countries like India, Brazil, and Bangladesh will seem to be doing very well. Nonetheless, the indicator of safely managed, and rural-urban gap, points to more profound governance issues. This can be aligned with Lawless et al. (2024), who highlight the importance of institutional analysis in gaining

insights into the role of governance arrangements in determining long-term water outcomes. In the current research, the implication is also evident: equity monitoring has to be introduced into the legal frameworks, rather than coverage expansion.

On the whole, the discussion shows that the interaction of law, policy and governance capacity is the key to sustainable water access and rights. Effective policy mechanisms play a key role in realizing rights in practice, whereas strong legal frameworks create a sense of legitimacy and accountability. To achieve fair water governance, nations are advised to enhance enforceable legal obligations, better institutional coordination, scale up rural and urban service surveillance, as well as participatory decision-making. Such steps are necessary to shift the nominal acknowledgment of water rights into real, sustainable and equitable access.

5. Conclusion

This study has analyzed the connection between the laws, government systems, and fair access to drinking-water in the sample countries based on standardized JMP data. The results show that although legal acknowledgment of water rights offers a significant normative basis, there is no guarantee that this will be converted into universal or fair access. Rather, the success of governance frameworks, especially institutional capacity, regulatory frameworks, and service delivery systems are critical determinants of access and equity. Well-managed water access and low rural-urban inequalities are attributes of countries with robust governance structures, including Germany, which shows that well-coordinated institutional mechanisms can guarantee both access and equity. Conversely, moderate frameworks, such as India and Brazil, have both moderate basic access and lower safely managed access and inequalities, which demonstrate weaknesses in implementation and quality of services. The findings also indicate that the access levels and dramatic disparities are much lower with weaker governance contexts as in the case of Ethiopia. Bangladesh case

highlights that the differences in access patterns need to be interpreted in a context-specific manner, especially in an urban environment with a high rate of change. In general, the study validates the argument that equitable water governance goes beyond legal acknowledgment; it relies on the combination of enforceable policies and institutional harmonization and equity-based monitoring systems. The mechanisms of strengthening the policy should then be directed towards enhancing effectiveness

of regulations, better service delivery in rural and urban areas, as well as accountability in the implementation. The results can be used to further discussions on sustainable water access by showing that the quality of governance is the key to delivering fair results. This analysis can be expanded to find further insights in future studies that take into account other indicators, longitudinal data, and context-specific institutional measurements to understand water governance and rights realization better.

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