

Inclusivity of Climate Change Adaptation Strategies and Related Policies for Persons with Disabilities in Garissa County, Kenya

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ABSTRACT

Climate change adaptation policies and programmes are increasingly implemented in Kenya's Arid and Semi-Arid Lands (ASALs). Yet, the extent to which they are inclusive of Persons with Disabilities (PWDs) remains insufficiently documented. This study evaluated the extent to which climate change adaptation strategies and related policies in Garissa County include PWDs. The study employed a convergent parallel mixed-methods design. Quantitative data were collected from 189 Persons with Disabilities using a structured questionnaire, while qualitative evidence was obtained through 15 Key Informant Interviews with government officials, representatives of Organizations of Persons with Disabilities (OPDs), and development partners, together with one Focus Group Discussion involving eight Persons with Disabilities. Quantitative data were analysed using descriptive statistics, while qualitative data were analysed thematically and integrated with the quantitative findings. Only 38.1% of respondents reported awareness of climate change programmes, while 47.1% were unaware and 14.8% were uncertain. Among respondents aware of such programmes, 88.8% reported having participated, which represented only 33.8% of the total sample. Perceptions of programme inclusivity were moderate, with mean scores ranging from 2.85 to 3.21. The lowest score concerned whether climate programmes considered the needs of PWDs ($M = 2.85$, $SD = 1.411$), while accessible information recorded the highest score ($M = 3.21$, $SD = 1.500$). Qualitative findings identified gaps in accessible communication, physical accessibility, disability-responsive planning, funding, institutional coordination, disability-disaggregated data, and enforcement. The study concludes that although disability inclusion is recognized in national and county policy frameworks, implementation remains inconsistent. Strengthening disability-responsive planning, accessible communication, budgeting, monitoring, accountability, and meaningful participation of PWDs is necessary to translate policy commitments into inclusive climate adaptation outcomes.

Keywords: Climate Change Adaptation, Disability Inclusion, Climate Policy, Persons With Disabilities, Garissa County

INTRODUCTION

Climate change is increasingly recognized as a major threat to sustainable development, particularly in regions exposed to recurrent droughts, floods, extreme temperatures and livelihood insecurity. Persons with Disabilities (PWDs) may experience disproportionate impacts because environmental and institutional barriers interact with impairment to restrict access to information, services, infrastructure, livelihoods and decision-making. Disability-inclusive climate adaptation therefore requires more than the formal recognition of disability in policy; it requires practical measures that enable equitable access, participation and benefit sharing.

International frameworks, including the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD), the Sendai Framework for Disaster Risk Reduction and the Sustainable Development Goals, provide a basis for inclusive climate action. The study's theoretical framework combines the Social Model of Disability and Climate Justice Theory. The Social Model emphasizes that exclusion is produced by environmental, institutional and attitudinal barriers, while Climate Justice Theory emphasizes equity,

recognition, participation and fair distribution of climate resources. Together, the theories provide a basis for assessing whether adaptation systems remove barriers and distribute adaptation benefits equitably.

In Kenya, climate adaptation is guided by national legislation and policy frameworks, including the Climate Change Act (2016), National Climate Change Action Plan (NCCAP) and Persons with Disabilities Act (2025). At county level, the Garissa County Integrated Development Plan and Garissa County Climate Change Action Plan (2023–2028) provide relevant frameworks. However, policy recognition does not necessarily translate into accessible communication, disability-responsive monitoring, accountability or meaningful participation.

Garissa County provides an important context for examining this issue. As an Arid and Semi-Arid Land (ASAL) county, it experiences recurrent drought, flooding, water scarcity, food insecurity and livelihood insecurity. These challenges may be compounded for PWDs by poverty, inaccessible infrastructure, communication barriers and limited participation in climate governance. Although previous studies have examined climate vulnerability, drought adaptation and resilience in Kenya, limited empirical attention has focused on how PWDs experience climate adaptation policies and programmes, particularly in ASAL contexts. This study addresses this gap by evaluating the extent to which climate change adaptation strategies and related policies include PWDs in Garissa County.

The study examines inclusion through awareness and participation, accessibility of meeting venues, accessible information, equal treatment and meaningful involvement in climate programmes. By integrating quantitative evidence from PWDs with qualitative perspectives from government officials, Organizations of Persons with Disabilities (OPDs) and development partners, the study identifies the extent of inclusion and key implementation barriers. It also contributes to disability-inclusive climate adaptation literature by examining the policy-to-practice gap and providing empirical evidence from an ASAL context. Its findings are intended to inform climate planning, disability inclusion, programme implementation and accountability at county and national levels.

Problem Statement

Climate adaptation policies and programmes are intended to strengthen resilience and protect vulnerable populations. In principle, inclusive adaptation should ensure that PWDs have access to climate information, accessible facilities, reasonable accommodation, livelihood support, and opportunities to participate in planning and decision-making. In practice, the existence of a policy commitment does not necessarily guarantee accessible implementation.

This challenge is particularly important in Arid and Semi-Arid Lands (ASALs), where recurrent drought, flooding, water scarcity, food insecurity and livelihood insecurity may intensify existing vulnerabilities. In Garissa County, PWDs may face additional barriers related to inaccessible infrastructure, inadequate communication, limited awareness, poverty, stigma and restricted participation in climate and development processes.

The study identified a policy-to-practice gap in Garissa County. Although national and county frameworks recognize disability inclusion, implementation remains inconsistent. PWDs reported limited awareness of climate programmes and barriers related to accessible communication, physical accessibility, consideration of disability-specific needs and meaningful participation. Qualitative findings further identified inadequate funding, limited disability-disaggregated data, weak institutional coordination and insufficient enforcement as implementation constraints.

Moreover, perceived inclusion does not necessarily demonstrate objective accessibility. While respondents' experiences provide important evidence of how PWDs encounter climate adaptation programmes, they do not independently establish whether facilities, communication systems, budgets and participation mechanisms meet accessibility standards.

The problem is therefore not simply the absence of disability and climate policies, but the limited translation of policy commitments into practical accessibility, participation, reasonable accommodation and equitable access

to adaptation benefits. This study addresses this gap by evaluating the extent to which climate change adaptation strategies and related policies are inclusive of PWDs in Garissa County, focusing on awareness and participation, physical accessibility, accessible communication, equal treatment and meaningful involvement.

Objective of the Study

The study objective addressed in this article was: To evaluate the extent to which climate change adaptation strategies and related policies are inclusive of Persons with Disabilities in Garissa County, Kenya.

The corresponding research question was: To what extent are existing climate change adaptation strategies and policies inclusive of the needs and perspectives of Persons with Disabilities?

THEORETICAL FRAMEWORK

This study was guided by the **Social Model of Disability** and **Climate Justice Theory**. Together, the frameworks explain the barriers affecting PWDs' participation and provide a basis for assessing equity, recognition, participation and access to climate adaptation benefits.

Social Model of Disability

The Social Model views disability primarily in terms of social, environmental, institutional, and communication barriers rather than impairment itself. In climate adaptation, exclusion may occur when venues are inaccessible, information is not provided in appropriate formats, Kenyan Sign Language interpretation is unavailable, or PWDs are excluded from decision-making. The model therefore informed the assessment of disability-specific needs, physical accessibility, communication accessibility, equal treatment and meaningful participation in climate adaptation programmes.

Climate Justice Theory

Climate Justice Theory emphasizes equity, rights, recognition, participation and fair distribution of climate-related risks and benefits. For PWDs, this requires equitable access to climate information, adaptation resources, decision-making and reasonable accommodation. The theory therefore informed the assessment of awareness, participation, equal treatment and meaningful involvement of PWDs in climate adaptation programmes.

Application to Objective Two

The two theories were applied together because they address complementary dimensions of disability-inclusive climate adaptation. The Social Model identifies the institutional, physical and environmental barriers that restrict participation, while Climate Justice Theory assessed inclusion through awareness, participation, physical accessibility, accessible communication, equal treatment and meaningful involvement in climate programmes. The framework also guided analysis of the policy-to-practice gap. Policy recognition was not treated as sufficient evidence of inclusion; rather, the study examined whether policy commitments translated into accessible, participatory and equitable climate adaptation practices.

LITERATURE REVIEW

Disability Inclusion in Climate Change Adaptation

PWDs may face disproportionate climate risks because environmental and institutional barriers can restrict access to information, infrastructure, services, livelihoods and decision-making (Stough & Kelman, 2018). Disability-inclusive adaptation therefore requires accessible information, reasonable accommodation, accessible infrastructure, participation and disability-responsive programme design (Handicap International, 2022). Kenyan literature also emphasizes the inclusion of marginalized groups in climate governance and the need to strengthen disability inclusion in ASAL contexts (Lusambili et al., 2021; Opiyo & Makori, 2023).

Disability Rights and Climate Adaptation

The UNCRPD provides a rights-based foundation for disability-inclusive climate adaptation, emphasizing equality, accessibility and participation. Articles 9 and 11 are particularly relevant to accessible information, infrastructure and protection of PWDs during situations of risk and emergencies. Climate adaptation should therefore integrate accessibility and participation throughout the programme cycle.

Kenya's Climate Change and Disability Policy Framework

Kenya has established frameworks supporting climate adaptation and disability inclusion, including the Climate Change Act (2016), NCCAP 2023–2027, Persons with Disabilities Act (2025), Garissa County Integrated Development Plan and Garissa County Climate Change Action Plan (2023–2028). However, policy recognition does not necessarily ensure disability-responsive budgets, indicators, monitoring or accountability. The study therefore distinguishes between policy inclusion and implementation inclusion.

Policy and Implementation Gap

Kenya's climate policy architecture provides a basis for inclusive adaptation through the Climate Change Act, NCCAP and county climate planning. The Garissa County Climate Change Action Plan (2023–2028) provides a local framework for climate resilience. However, the thesis identified limited disability-responsive implementation mechanisms, measurable indicators, disability-disaggregated monitoring and accountability pathways. This creates a policy-to-practice gap in which disability may be acknowledged in policy language without being consistently reflected in programme design, budgets, communication systems and implementation procedures.

Analytical Dimensions of Inclusivity

The study assesses inclusion through five dimensions: consideration of PWDs' needs, accessible meeting venues, accessible information, equal treatment, and meaningful participation. Together, these dimensions provide an operational framework for assessing disability inclusion in climate adaptation.

Intersectionality and Disability in Climate Adaptation

Disability may intersect with gender, age, poverty, livelihood status and displacement to shape climate vulnerability and access to adaptation resources. These intersecting factors may be particularly significant in ASAL contexts affected by climate-related shocks. Although this study does not undertake comprehensive intersectional analysis, the perspective highlights an important area for future research.

Disability-Inclusive Climate Adaptation in ASAL Contexts

ASAL counties face recurrent drought, water scarcity, food insecurity, livelihood insecurity and limited services, which may compound disability-related barriers. Garissa provides relevant evidence of mechanisms through which exclusion may occur, including inaccessible communication, limited participation, inadequate disability-responsive planning, weak data and accountability gaps. These findings may inform disability-inclusive climate planning in comparable ASAL contexts, while recognizing differences between counties.

METHODOLOGY

Research Design and Study Area

The study used a convergent parallel mixed-methods design, integrating quantitative and qualitative data during interpretation. The quantitative component assessed the inclusivity of climate change adaptation programmes as experienced by Persons with Disabilities (PWDs), while the qualitative component provided contextual insights into policy implementation, accessibility, communication and participation.

The study was conducted in Garissa County, Kenya, an Arid and Semi-Arid Land (ASAL) county affected by recurrent drought, flooding, water scarcity and livelihood insecurity. These conditions, alongside socioeconomic and institutional factors, make Garissa an appropriate setting for examining disability inclusion in climate change adaptation and the relationship between policy commitments and their practical implementation.

Population and Sample

The target population comprised approximately 15,000 registered Persons with Disabilities in Garissa County, based on records from the National Council for Persons with Disabilities (NCPWD, 2023). The qualitative component additionally included stakeholders with knowledge of climate change adaptation and disability inclusion, including representatives from county government departments, Organizations of Persons with Disabilities (OPDs), non-governmental organizations (NGOs), development partners and community leadership.

Quantitative Sample

The quantitative sample size was determined using Yamane's (1967) formula for a finite population:

$$n = N / [1 + N(e)^2]$$

Where:

- n = required sample size;
- N = target population;
- e = margin of error.

Using a target population of 15,000 and a margin of error of 0.08 at a 95% confidence level:

$$n = 15,000 / [1 + 15,000(0.08)^2]$$

$$n = 15,000 / 97$$

$$n = 154.64 \approx 155$$

To account for an anticipated 10% non-response rate, the sample was adjusted:

$$n_{adj} = 155 \times 1.10 = 170.5 \approx 171$$

Thus, the minimum required quantitative sample was 171 respondents. However, to enhance statistical precision, support representation across disability categories and compensate for incomplete responses, the study recruited and analysed data from **189 PWDs**.

The 189 respondents were selected using stratified random sampling to enhance proportional representation of the major socio-demographic and disability characteristics within the study population.

Table 1: Gender -Demographic Characteristics of Respondents (N = 189)

Gender	Frequency	Percentage
Male	96	50.8%
Female	90	47.6%
Prefer/Other	3	1.6%
Total	189	100.0%

Source: Author's analysis of survey data, 2026.

The original thesis records 189 valid respondents comprising gender. The original thesis recorded 96 male respondents (50.8%), 90 female respondents (47.6%), and 3 respondents who selected Prefer/Other (1.6%).

Table 2: Age Group Demographic Characteristics of Respondents (N = 189)

Age group	Frequency	Percentage
18–24	34	18.0%
25–34	57	30.2%
35–44	44	23.3%
45–54	30	15.9%
55–64	21	11.1%
65+	3	1.6%
Total	189	100.0%

Source: Author's analysis of survey data, 2026.

Age distribution was 18–24 years (18.0%), 25–34 (30.2%), 35–44 (23.3%), 45–54 (15.9%), 55–64 (11.1%), and 65 years and above (1.6%). These characteristics provide important contextual information for interpreting the aggregate findings, while the present analysis does not undertake statistical subgroup comparisons by gender or age.

Table 3: Disability Characteristics of Respondents (N = 189)

Disability type	Frequency	Percentage
Physical	61	32.3%
Hearing	57	30.2%
Visual	40	21.2%
Cognitive	13	6.9%
Other	18	9.5%
Total	189	100.0%

Source: Author's analysis of survey data, 2026.

The original thesis records 189 valid respondents comprising persons with physical disabilities (61; 32.3%), hearing disabilities (57; 30.2%), visual disabilities (40; 21.2%), cognitive disabilities (13; 6.9%), and other disabilities (18; 9.5%). This distribution provides important context for interpreting the aggregate inclusivity findings. Because the present analysis does not report subgroup statistical tests, the results should not be interpreted as demonstrating identical experiences across disability categories.

Qualitative Sample

The qualitative component comprised 15 Key Informant Interviews (KIIs) and one Focus Group Discussion (FGD) involving eight PWDs. The KIIs included representatives of relevant government departments, OPDs, and development partners with knowledge or responsibilities related to climate change adaptation and disability inclusion. Purposive sampling was used for the qualitative component because participants were selected on the basis of their relevant knowledge, experience and institutional responsibilities. The FGD provided an opportunity for PWDs to describe their experiences and perspectives concerning access to climate adaptation programmes, communication, participation and implementation of disability-inclusive policies.

The combination of PWD perspectives and institutional stakeholder perspectives enabled triangulation of evidence from different sources. The FGD comprised eight PWDs: three Deaf participants, two participants with visual disabilities, and three participants with physical disabilities. This composition provided perspectives from different disability groups on access to climate adaptation programmes, communication, physical accessibility, and participation. The KIIs were purposively selected from relevant government departments, Organizations of Persons with Disabilities (OPDs), and development partners based on their knowledge, experience and institutional responsibilities concerning climate change adaptation and disability inclusion.

Data Collection Instruments and Procedures

Quantitative data were collected using a structured questionnaire covering awareness and participation in climate change programmes and five-point Likert-scale statements on programme inclusivity. Qualitative data were collected through semi-structured interviews and one Focus Group Discussion (FGD) exploring policy implementation, accessibility, communication, participation and the experiences of PWDs.

Using both quantitative and qualitative instruments enabled the study to assess perceived inclusion and understand the institutional and contextual factors influencing programme implementation.

Sampling Procedures

The study used different sampling approaches for the two components of the mixed-methods design. Stratified random sampling was used for the quantitative component to enhance representation of major disability categories, while purposive sampling was used for the qualitative component to select participants with relevant knowledge and experience in climate change adaptation and disability inclusion, including government representatives, OPDs and development partners.

This combination provided broad quantitative coverage and in-depth qualitative perspectives on disability-inclusive climate adaptation.

Data Analysis and Integration

Quantitative data were analysed using SPSS Version 27 and descriptive statistics, including frequencies, percentages, means and standard deviations. Frequencies and percentages described awareness and participation, while means and standard deviations summarized responses to the five-point Likert-scale inclusivity indicators.

Qualitative data from KIIs and the FGD were analysed thematically, focusing on policy implementation, accessibility, communication, participation, funding, institutional coordination, disability-disaggregated data and enforcement. Quantitative and qualitative findings were integrated to identify areas of convergence and provide contextual explanations for the observed patterns.

The mixed-methods approach enabled the study to interpret perceived inclusion alongside qualitative evidence on the practical and institutional factors influencing disability inclusion.

Qualitative Trustworthiness

The credibility of the qualitative findings was strengthened through methodological triangulation, combining perspectives from PWDs and institutional stakeholders with quantitative survey findings.

The 15 KIIs and one FGD provided complementary perspectives on disability-inclusive climate adaptation. The FGD included eight PWDs: three Deaf participants, two participants with visual disabilities and three with physical disabilities. Integrating these perspectives with quantitative evidence helped identify areas of convergence and provided contextual explanations for the survey findings.

Where procedures such as thematic saturation, member checking, peer debriefing or independent coding were not documented in the original research records, they are not claimed in this study.

RESULTS

Socio-Demographic Profile of Respondents

The 189 valid respondents represented a diverse socio-demographic profile. Gender representation was relatively balanced, with males accounting for 50.8%, females 47.6%, and Prefer/Other 1.6%.

The largest age group was 25–34 years (30.2%), followed by 35–44 years (23.3%) and 18–24 years (18.0%). Respondents aged 45–54 accounted for 15.9%, those aged 55–64 for 11.1%, and those aged 65 years and above for 1.6%.

Disability representation comprised physical disabilities (32.3%), hearing disabilities (30.2%), visual disabilities (21.2%), cognitive disabilities (6.9%) and other disabilities (9.5%). The diversity of the sample provides important context for interpreting the overall findings.

However, because the present analysis reports aggregate results, these characteristics should not be interpreted as evidence of statistically significant differences between gender, age or disability groups.

Awareness and Participation in Climate Change Programmes

The findings reveal a substantial gap in awareness of climate change adaptation programmes among Persons with Disabilities (PWDs) in Garissa County. Of the 189 respondents, 72 (38.1%) reported awareness of climate change programmes, while 89 (47.1%) were unaware and 28 (14.8%) were uncertain. This indicates limited access to information among PWDs and may restrict their opportunities to access adaptation benefits and participate in programmes.

Among respondents who reported awareness, 64 (88.9%) participated, seven (9.7%) did not, and one (1.4%) was uncertain. The 64 participants represented 33.9% of the total sample. Thus, participation was relatively high among those reached by programmes, while overall programme reach remained limited by low awareness. This suggests that accessible information and programme outreach may be greater barriers than unwillingness to participate.

Perceived Inclusivity of Climate Change Programmes

Respondents assessed five dimensions of programme inclusivity using a five-point Likert scale (1 = Strongly Disagree; 5 = Strongly Agree). The results are presented in Table 4.

Table 4: Perceived Inclusivity of Climate Change Programmes

Inclusivity indicator	Mean	SD	Agree/Strongly Agree	Interpretation
Programmes consider the needs of PWDs	2.85	1.411	38.6%	Lowest / moderate
Meeting venues are accessible	3.19	1.409	46.6%	Moderate
Information is provided in accessible formats	3.21	1.500	51.3%	Highest / moderate
Government and NGO programmes treat PWDs equally	3.17	1.463	47.7%	Moderate
PWDs are meaningfully involved	3.16	1.469	49.2%	Moderate

Source: Author's analysis of survey data, 2026.

The five indicators recorded mean scores ranging from **2.85 to 3.21**, indicating moderate perceived inclusivity. Consideration of PWDs' needs recorded the lowest score ($M = 2.85$, $SD = 1.411$), with only 38.6% agreeing or strongly agreeing. This suggests that disability recognition has not been consistently translated into programme design and implementation.

Accessible information recorded the highest mean ($M = 3.21$, $SD = 1.500$), although inclusion remained moderate. While 51.3% agreed or strongly agreed that information was accessible, 35.5% disagreed or strongly disagreed. Meeting venue accessibility also remained moderate ($M = 3.19$, $SD = 1.409$), with 46.6% reporting agreement.

Equal treatment recorded a mean of 3.17 ($SD = 1.463$), with 47.7% agreeing or strongly agreeing. Meaningful participation recorded a mean of 3.16 ($SD = 1.469$), with 49.2% agreeing or strongly agreeing and 35.0% disagreeing or strongly disagreeing.

Overall, the findings indicate that disability inclusion was partial and inconsistent, with no dimension demonstrating consistently strong inclusion.

Qualitative Findings on Policy Implementation

Qualitative findings reinforced the quantitative results, indicating that disability is recognized in national and county policy frameworks but is not consistently reflected in programme implementation. Participants identified barriers including inadequate Kenyan Sign Language interpretation, inaccessible venues, inadequate funding, limited awareness, insufficient disability-disaggregated data and weak enforcement.

Relevant frameworks identified included the Constitution of Kenya (2010), Climate Change Act (2016), National Climate Change Action Plan, Persons with Disabilities Act (2025), and Garissa County Climate Change Action Plan (2023–2028).

“PWDs are recognized as categories of vulnerable groups, but the challenge is that many climate programs are still planned without considering accessibility and communication needs.”

These findings indicate that the main challenge is the limited translation of policy commitments into practical accessibility, participation and accountability.

Integration of Quantitative and Qualitative Findings

The quantitative and qualitative findings demonstrate a policy-to-practice gap. While the quantitative results showed low awareness and moderate perceived inclusion, qualitative evidence identified barriers related to communication, physical accessibility, disability-responsive planning, funding, institutional coordination, data and enforcement.

The findings suggest that inclusion exists along a continuum rather than as a binary condition. Although accessible information recorded the highest mean, only 51.3% agreed or strongly agreed that information was accessible. Similarly, meaningful participation remained moderate, indicating that inclusion has not yet been consistently institutionalized.

Disability Disaggregation and Interpretation of Findings

The study used stratified sampling to enhance representation of major disability categories. The 189 respondents comprised 61 persons with physical disabilities (32.3%), 57 with hearing disabilities (30.2%), 40 with visual disabilities (21.2%), 13 with cognitive disabilities (6.9%), and 18 with other disabilities (9.5%).

These groups may experience different barriers; for example, communication accessibility may be particularly important for Deaf persons, while physical accessibility may be more significant for persons with mobility impairments. However, the present analysis reports aggregate findings and does not establish statistically significant differences between disability groups. Future research should undertake disability-disaggregated analysis where sample sizes permit.

DISCUSSION

Moderate but Inconsistent Disability Inclusion

The findings show that climate adaptation programmes in Garissa County demonstrate moderate but inconsistent disability inclusion. The five indicators recorded mean scores ranging from 2.85 to 3.21, with consideration of PWDs’ needs scoring lowest ($M = 2.85$, $SD = 1.411$). This suggests that disability recognition has not been consistently translated into programme design and implementation.

Qualitative findings reinforce this observation, highlighting inaccessible venues, limited Kenyan Sign Language (KSL) interpretation and inadequate reasonable accommodation. Disability inclusion therefore needs to be

integrated across programme planning, budgeting, implementation, monitoring and evaluation rather than being addressed as an additional or stand-alone consideration.

The Policy-to-Practice Gap

A key finding is the gap between policy recognition and implementation. Although national and county frameworks recognize disability inclusion, these commitments have not consistently resulted in accessible and participatory climate adaptation programmes.

The findings support the need for disability-responsive indicators, disaggregated data, dedicated budgets, accessibility standards, clear institutional responsibilities and accountability mechanisms. This is consistent with literature highlighting challenges in translating inclusive policies into practice (Lusambili et al., 2021; Handicap International, 2022).

Communication Accessibility as a Core Inclusion Requirement

Communication accessibility recorded the highest mean score ($M = 3.21$), but remained moderate, with 35.5% of respondents disagreeing or strongly disagreeing that climate information was provided in accessible formats.

For Deaf persons, limited Kenyan Sign Language interpretation can restrict access to climate information and decision-making, while persons with visual disabilities may require Braille, audio or other accessible formats. Communication accessibility should therefore be treated as a core requirement of climate adaptation rather than an optional accommodation. Climate information should be provided through multiple accessible formats and communication channels that respond to the diverse needs of persons with different disabilities.

Awareness, Participation and Climate Justice

Only 38.1% of respondents reported awareness of climate adaptation programmes, while 47.1% were unaware and 14.8% were uncertain. This suggests that many PWDs may be excluded from adaptation opportunities before they have an opportunity to participate.

However, participation was relatively high among respondents who were aware of programmes. This indicates that programme reach, information accessibility and awareness may represent greater barriers than unwillingness to participate. From a Climate Justice perspective, PWDs should be recognized as rights holders and active contributors to climate governance, with meaningful opportunities to influence planning, implementation, monitoring and evaluation.

Physical Accessibility and Reasonable Accommodation

Accessible meeting venues recorded a mean score of 3.19, with 46.6% of respondents agreeing or strongly agreeing that venues were accessible. This indicates continuing gaps in physical accessibility.

Accessible venues, communication support and other reasonable accommodations should therefore be incorporated into climate adaptation planning and budgeting from the outset. Accessibility should be considered during project design rather than retrofitted after implementation has begun.

Equal Treatment and Meaningful Participation

Equal treatment and meaningful participation recorded mean scores of 3.17 and 3.16, respectively. While these findings indicate some degree of inclusion, equality and participation remain inconsistent. Only 49.2% of respondents agreed or strongly agreed that PWDs were meaningfully involved.

Meaningful participation requires more than attendance at meetings or programme activities. PWDs and organizations of persons with disabilities (OPDs) should have opportunities to influence programme priorities, implementation, monitoring and resource allocation. Structured representation in climate committees and other decision-making structures can strengthen participation and accountability.

Perceived Inclusion, Objective Accessibility and Social Desirability Bias

The findings primarily reflect respondents' experiences and perceptions and should not be interpreted as independent verification of accessibility, programme practices or policy compliance. There is an important distinction between perceived inclusion and objective accessibility. A programme may be perceived as inclusive by some participants while still containing physical, communication or institutional barriers that are not captured through self-reported measures.

Furthermore, self-reported responses may be affected by social desirability bias, whereby respondents provide answers that they perceive to be socially acceptable or supportive of the objectives of inclusion. Individual experiences, expectations, awareness of rights and previous interactions with service providers may also influence perceptions of inclusion.

The study strengthened interpretation by examining both quantitative and qualitative evidence; however, it did not undertake systematic independent accessibility audits or direct observation of all climate adaptation programmes. Consequently, the findings cannot establish objectively whether programme venues, communication systems, information materials or participation mechanisms fully complied with accessibility requirements.

Future research should therefore combine self-reported perceptions with independent accessibility audits, direct observation and document reviews. Such assessments could examine physical accessibility of venues and infrastructure, communication accessibility, availability of reasonable accommodation, accessibility of climate information, and the extent to which PWDs participate meaningfully in planning and decision-making. Programme documents, budgets and monitoring reports could also be reviewed to determine whether disability inclusion is reflected in institutional commitments and actual resource allocation. Triangulating these sources would help validate self-reported findings and identify potential gaps between policy commitments, perceived inclusion and objectively accessible practice.

Intersectionality and Compounding Vulnerability

Disability does not operate independently of other social and economic conditions. Gender, age, poverty, food insecurity, livelihood status and displacement may intersect with disability to shape vulnerability to climate change and access to adaptation programmes.

Women with disabilities, for example, may experience additional barriers arising from gender inequality, limited economic opportunities, caregiving responsibilities and restricted participation in household or community decision-making. Older persons with disabilities may face greater mobility, health and social-support challenges, while children and young persons with disabilities may depend heavily on caregivers for access to information and services.

Poverty and food insecurity may further intensify vulnerability because households with limited resources have fewer opportunities to adapt to drought, livelihood losses and other climate-related shocks. Similarly, displacement resulting from drought, floods, resource conflict or loss of livelihoods can disrupt social networks, access to services and assistive devices and may create additional barriers to accessing adaptation programmes.

The present study did not undertake sufficient quantitative subgroup analysis to establish statistically significant differences across these intersecting characteristics. Future research should therefore employ larger and more diverse samples to examine how gender, age, poverty, food insecurity, livelihood status and displacement interact with disability to influence awareness, participation, accessibility and access to climate adaptation benefits. Such an intersectional approach would strengthen the application of Climate Justice principles by recognizing the multiple and compounding forms of vulnerability experienced by different groups of PWDs.

Implications for Climate Governance in ASAL Contexts

The findings have relevance beyond Garissa County because many Arid and Semi-Arid Lands (ASALs) in Kenya and parts of East Africa face common challenges, including climate variability, recurrent drought, livelihood insecurity, infrastructure deficits, limited access to public services and institutional capacity constraints. Pastoral and agro-pastoral livelihoods, population mobility and dispersed settlements can further complicate the delivery of inclusive climate adaptation services.

Nevertheless, the findings from Garissa should not be generalized automatically to all ASAL counties or East African contexts because counties and countries differ in institutional arrangements, socioeconomic conditions, livelihood systems, disability prevalence, climate exposure and availability of resources. The study instead identifies potentially transferable concerns, including inaccessible climate information, limited participation of PWDs, inadequate disability-responsive planning, insufficient disability-disaggregated data and weak accountability mechanisms.

For other ASAL counties, these findings highlight the importance of integrating disability inclusion into county climate action planning, disaster-risk reduction, livelihood programmes, early-warning systems and community-based adaptation. At the regional level, lessons from Garissa may contribute to broader discussions on inclusive climate governance in pastoral and climate-vulnerable communities across East Africa. However, adaptation approaches should be locally contextualized and developed in consultation with PWDs and their representative organizations.

Implications for the Disability Rights Framework

The findings are also relevant to Kenya's disability-rights obligations under the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD), particularly Article 9 on accessibility and Article 11 on situations of risk and humanitarian emergencies.

Article 9 emphasizes accessibility to the physical environment, transportation, information, communications and other facilities and services, while Article 11 requires States Parties to take necessary measures to ensure the protection and safety of persons with disabilities in situations of risk, including situations of armed conflict, humanitarian emergencies and natural disasters. Climate-related droughts, floods and other hazards therefore require adaptation and risk-management systems that are accessible to PWDs.

The barriers identified in this study—including inaccessible venues, inadequate communication support, limited awareness and inconsistent participation—demonstrate the practical importance of translating disability-rights principles into climate governance. Accessible information, communication, physical environments, reasonable accommodation and meaningful participation should be integrated into climate adaptation systems from the planning stage rather than introduced only after barriers have emerged.

Overall, the findings reinforce that disability-inclusive climate adaptation is both a development requirement and a rights-based obligation. Achieving meaningful inclusion requires moving beyond general policy commitments towards practical mechanisms for accessibility, participation, representation, resource allocation, monitoring and accountability. Combining the perspectives of PWDs with objective accessibility assessments and intersectional analysis can provide stronger evidence for designing climate adaptation programmes that are equitable, accessible and responsive to diverse experiences of climate vulnerability.

CONCLUSION

The study concludes that climate change adaptation strategies and related policies in Garissa County demonstrate moderate but inconsistent disability inclusion. Although disability is recognized within national and county policy frameworks, implementation remains incomplete. Low programme awareness, inaccessible communication and facilities, limited consideration of disability-specific needs, inadequate participation mechanisms and weak implementation of policy provisions constrain equitable access to adaptation benefits.

The study found a substantial gap in awareness of climate adaptation programmes among PWDs. However, participation was relatively high among those who were aware, suggesting that limited overall participation may be linked more to programme reach, accessible information and institutional inclusion than to unwillingness to participate. Across the five dimensions assessed consideration of PWD needs, physical accessibility, accessible communication, equal treatment and meaningful participation perceived inclusion remained moderate. This indicates that some elements of inclusion exist but have not been systematically institutionalized.

Qualitative findings further demonstrate a policy-to-practice gap, reflected in inadequate accessible communication, physical accessibility challenges, limited disability-responsive planning, inadequate funding, weak institutional coordination, insufficient disability-disaggregated data and limited enforcement.

Overall, the findings, informed by the Social Model of Disability and Climate Justice Theory, demonstrate the need to move from policy recognition to systematic implementation. Strengthening accessibility, meaningful participation, disability-responsive budgeting, data systems, monitoring, coordination and accountability would promote more equitable climate resilience and inclusive sustainable development for PWDs in Garissa County and comparable ASAL contexts.

RECOMMENDATIONS

Based on the findings of the study, the following recommendations are proposed to strengthen disability-inclusive climate change adaptation in Garissa County.

Implementation Mechanisms for Disability-Inclusive Climate Adaptation

To translate the study findings into practical action, the recommendations should be supported by clearly defined institutional responsibilities, financing mechanisms, measurable indicators and strategies for addressing implementation barriers. Disability-inclusive climate adaptation requires coordinated action between county government departments, national agencies, organizations of persons with disabilities (OPDs), development partners and communities.

Recommendation	Lead/Responsible Institutions	Potential Funding Sources	Key Monitoring Indicators	Potential Barriers and Mitigation
Integrate disability inclusion into climate policies, plans and programmes	Garissa County Department of Environment/Climate Change; County Department of Social Services; NCPWD	County climate budgets; national climate finance; development partners	Percentage of climate programmes incorporating disability inclusion measures; number of plans with disability-responsive indicators	Limited institutional capacity; address through technical training and clear departmental responsibilities
Improve accessibility of climate information and early-warning systems	County Department of Environment/Climate Change; disaster management units; NCPWD; OPDs	County budgets; national climate programmes; donor and humanitarian funding	Percentage of climate information products available in accessible formats; number of early-warning messages disseminated through accessible channels	Limited accessible communication capacity; establish minimum accessibility standards and partnerships with OPDs
Provide reasonable accommodation and accessible communication	County Government departments; implementing organizations; OPDs	Programme budgets; county allocations; donor-funded projects	Percentage of relevant meetings with KSL interpretation or other required accommodations; percentage of programmes with	Additional costs and shortage of trained personnel; include accommodation costs during project design and budgeting

			dedicated accessibility budgets	
Increase meaningful participation of PWDs in climate governance	County Government; climate change committees; OPDs; NCPWD	County budgets; climate finance; development-partner programmes	Number and percentage of PWD representatives in climate committees; number of consultations involving OPDs	Tokenistic participation; establish formal representation and document how PWD recommendations influence decisions
Strengthen accessibility of climate adaptation infrastructure	County Department of Public Works; Environment/Climate Change Department; NCPWD	County development budgets; climate finance; donor-funded infrastructure projects	Percentage of funded projects meeting accessibility standards; number of projects independently assessed for accessibility	Retrofitting costs and limited technical knowledge; incorporate universal design requirements at project design stage
Strengthen disability-disaggregated data and M&E	County Monitoring and Evaluation units; Environment Department; Social Services Department; NCPWD	County M&E budgets; national government programmes; development partners	Percentage of climate programmes collecting disability-disaggregated data; number of programmes reporting disability-related indicators	Weak data systems and inconsistent reporting; standardize disability indicators and reporting tools
Build capacity of programme implementers	County Government; NCPWD; OPDs; training institutions	County training budgets; donor programmes; climate adaptation funds	Number of staff trained; percentage of programme staff demonstrating knowledge of disability inclusion	Competing priorities and staff turnover; institutionalize regular training and orientation
Establish independent accessibility monitoring	NCPWD; County Government; OPDs; independent technical assessors	County climate budgets; donor technical assistance; research funding	Number of programmes independently audited; percentage of identified accessibility gaps addressed	Limited monitoring resources; integrate accessibility audits into routine programme M&E

Financing and Resource Mobilization

Implementation should be integrated into existing county and national planning and budgeting processes rather than treated as a separate disability programme. Potential financing sources include county climate change funds and development budgets, national climate finance mechanisms, development partners, humanitarian and resilience programmes, and other appropriate climate-finance instruments. Project proposals should include specific budget lines for accessibility, including interpretation, accessible communication materials, reasonable accommodation and accessibility assessments.

Partnerships with organizations of persons with disabilities, research institutions, development partners and technical organizations can also provide technical assistance and strengthen implementation capacity.

Monitoring and Accountability

The County Government should establish measurable disability-inclusion indicators within climate adaptation monitoring and evaluation frameworks. Indicators should measure not only the number of PWDs attending programmes but also the **quality and accessibility of their participation**. For example, monitoring should assess whether PWDs were represented in decision-making structures, whether their recommendations were considered, whether communication was accessible, and whether funded infrastructure met accessibility standards.

Annual or periodic accessibility audits should complement routine programme monitoring. Findings from these assessments should inform programme improvement, budget allocation and subsequent climate planning cycles.

Implementation Barriers

Potential barriers include limited financial resources, inadequate technical capacity, institutional resistance, competing development priorities, weak coordination between government departments, insufficient disability-disaggregated data and the risk of tokenistic participation. These challenges can be addressed through early integration of disability inclusion into project design and budgets, clear institutional mandates, capacity building, interdepartmental coordination, partnerships with OPDs, standardized accessibility indicators and regular accountability reviews.

The implementation of disability-inclusive climate adaptation should therefore move beyond policy commitments towards a measurable system in which responsible institutions, resources, activities and expected results are clearly identified. This approach would enable Garissa County and other ASAL counties to track progress and identify gaps requiring corrective action.

Limitations

The findings should be interpreted in light of several methodological and contextual limitations.

Self-Reported Perceptions and Objective Accessibility

First, the study relied primarily on respondents' experiences and perceptions rather than independent accessibility or legal-compliance audits. While these perceptions provide important evidence of how PWDs experience climate adaptation programmes, they may be influenced by individual experiences and expectations. Future studies should complement survey findings with accessibility audits, document reviews and direct observation.

Disability-Disaggregated Analysis

Second, although stratified random sampling was used to enhance representation of disability categories, the analysis did not provide detailed comparisons across specific disability types. Different groups may experience different barriers, particularly in communication and physical accessibility. Future research should undertake disability-disaggregated analysis where sample sizes permit.

Qualitative Sample and Transferability

Third, the qualitative component comprised 15 Key Informant Interviews and one Focus Group Discussion involving eight PWDs, including three Deaf participants, two participants with visual disabilities and three participants with physical disabilities. Although these participants provided valuable contextual and experiential evidence, the relatively small qualitative sample limits the extent to which the findings can represent all disability groups and institutional perspectives in Garissa County.

Geographical Scope and Generalizability

Fourth, the study was conducted in Garissa County; therefore, the findings should not be generalized automatically to all Kenyan counties or ASAL contexts. However, the identified mechanisms—including inaccessible communication, limited participation, inadequate disability-responsive planning, insufficient disability-disaggregated data and weak accountability—may provide useful areas for comparison in similar contexts.

Cross-Sectional Design

Fifth, the cross-sectional design captures conditions during the study period and cannot establish changes in disability inclusion over time. Longitudinal research could provide stronger evidence of changes in accessibility, participation and policy implementation.

Intersectional Analysis

Sixth, the study did not undertake a comprehensive intersectional analysis of how disability interacts with gender, age, poverty, livelihood characteristics and displacement. Future research should examine these intersecting factors and their influence on climate vulnerability and access to adaptation resources.

Scope of Inclusivity Dimensions

Finally, the study focused on five dimensions of inclusivity: disability-specific needs, physical accessibility, accessible communication, equal treatment and meaningful participation. Other dimensions, including access to climate finance, livelihood outcomes, digital accessibility and long-term adaptation benefits, were beyond its scope.

Overall Strengths of the Study

Despite these limitations, the convergent mixed-methods design, quantitative sample of 189 PWDs, qualitative evidence and integration of multiple data sources strengthen the study's contribution to understanding the policy-to-practice gap in disability-inclusive climate adaptation in an ASAL context.

Ethical Considerations

The study received ethical approval through the relevant university research structures and a research permit from NACOSTI. Participation was voluntary and based on informed consent. Confidentiality and anonymity were maintained, and participants were informed of their right to withdraw. Reasonable accommodations, including Kenyan Sign Language interpretation and other communication support including braille, were provided where necessary.

Conflict Of Interest

The authors declare that they have no conflict of interest.

Data Availability

The data supporting the findings are not publicly available because they contain participant-level information collected from Persons with Disabilities and other stakeholders. Data may be made available in appropriately anonymized form subject to relevant ethical and institutional requirements.

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