

Church-Government Partnerships in Strengthening Climate Change Adaptation in Semi-Arid Kenya: Evidence from Tharaka South Sub-County

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Abstract

Climate change continues to contribute to environmental degradation, food insecurity, water scarcity, and livelihood vulnerability in Kenya's Arid and Semi-Arid Lands (ASALs), necessitating collaborative adaptation beyond government efforts. This study examined church-government partnerships in enhancing climate change adaptation in Tharaka South Sub-County, Kenya. It assessed collaborative adaptation initiatives, their perceived effectiveness, the influence of religious teachings on environmental stewardship, institutional challenges, and the contribution of indigenous knowledge. Fisher's formula estimated a minimum sample of 384 respondents; however, financial and logistical constraints resulted in 133 participants, comprising 116 community members and 17 opinion leaders. A mixed-methods case study design was used, with data collected through questionnaires, interviews, focus group discussions, document analysis, and field observations. Quantitative data were analysed statistically, while qualitative data were analysed thematically. The findings showed that 96% of respondents reported active church-government collaboration. Church interventions included drought-resistant crops (100%), environmental awareness (96%), tree planting (84%), and water harvesting (52%), while government interventions included drought-tolerant seeds, agricultural training, and food relief (100% each), and water management projects (80%). Indigenous adaptation practices recorded the highest perceived effectiveness ($M = 2.48/3$), compared with government interventions ($M = 1.92$) and church interventions ($M = 1.50$). Furthermore, 52% identified integrated church-government-indigenous collaboration as the most effective approach. Major barriers included funding constraints (36%), corruption and resource mismanagement (20%), and inadequate technical capacity (20%). Joint capacity building (44%) and regular coordination meetings (32%) were identified as priority strategies. The study concludes that effective climate adaptation requires coordinated church-government partnerships, integration of indigenous and scientific knowledge, strengthened capacity building, and sustainable financing.

Keywords: *Climate change adaptation, Church-government partnerships, Faith-based organizations, Indigenous knowledge, Semi-arid Kenya*

1.0 Introduction

Climate change is one of the most significant global development challenges of the twenty-first century, with profound implications for food security, water resources, biodiversity, public health, and sustainable livelihoods. The Intergovernmental Panel on Climate Change (IPCC) reports that anthropogenic greenhouse gas emissions have increased global temperatures, contributing to more frequent and intense droughts, floods, heatwaves, and other extreme weather events that disproportionately affect vulnerable communities (IPCC, 2021). These impacts are particularly severe in developing countries, where poverty, dependence on rain-fed agriculture, weak institutions, and inadequate infrastructure constrain adaptive capacity.

Sub-Saharan Africa is among the regions most vulnerable to climate variability despite contributing minimally to global greenhouse gas emissions. Agriculture remains highly climate-sensitive, exposing millions to food insecurity, environmental degradation, livestock losses, and rural poverty (Niang et al., 2014). Strengthening adaptive capacity has therefore become a priority under the United Nations Framework Convention on Climate Change, the Sustainable Development Goals, and the African Union Agenda 2063 (IPCC, 2021).

Kenya is particularly vulnerable because about 80% of its landmass comprises arid and semi-arid lands (ASALs) characterized by recurrent droughts, erratic rainfall, land degradation, and declining agricultural productivity (Kenya National Bureau of Statistics [KNBS], 2022). These regions rely heavily on rain-fed agriculture and pastoralism, making livelihoods highly susceptible to climate shocks. In response, the Government of Kenya has enacted the Climate Change Act (2016), the National Climate Change Action Plan (NCCAP), and the

Nationally Determined Contribution (NDC) to strengthen climate resilience through coordinated multi-sectoral interventions. At county and sub-county levels, the practical significance of these frameworks lies in translating national adaptation priorities into locally coordinated activities involving government departments, communities, civil society, and faith-based organizations.

Climate governance increasingly recognizes that governments alone cannot address the complex challenges of climate change. Effective adaptation requires collaboration among public institutions, civil society, the private sector, local communities, and faith-based organizations. Such partnerships can facilitate resource sharing, knowledge exchange, institutional legitimacy, and community ownership of adaptation initiatives. Polycentric Governance Theory provides a useful lens because it emphasizes multiple decision centres operating at different levels and the potential for coordination among actors with complementary capacities. In this study, indigenous knowledge is treated not as an alternative to formal governance but as a locally embedded knowledge resource that can enter and influence this polycentric system through community participation, trusted social networks, and experiential knowledge.

Faith-based organizations (FBOs), particularly churches, have become important partners in promoting environmental sustainability and climate resilience. Their grassroots networks, public trust, and moral influence can mobilize communities toward collective environmental action (Allen & Pryor, 2021; Islam & Winkel, 2017). Beyond their traditional spiritual role, churches support environmental conservation, disaster response, agricultural extension, water-resource management, and community education.

“This study examined the role of church-government partnerships in climate change adaptation in Tharaka South Sub-County”

Religious teachings on stewardship of creation can provide moral motivation for responsible environmental management (Adler & Chan, 2022). However, the existence of a church presence does not automatically imply effective adaptation; effectiveness depends on the depth of coordination, technical complementarity, resources, accountability, and local ownership.

Globally, partnerships between governments and faith-based organizations have strengthened climate adaptation. In Brazil's semi-arid Sertão region, church-government collaborations have promoted household water harvesting, drought resilience, and food security. Similar partnerships in Burkina Faso, Niger, Ethiopia, and Southern Africa have enhanced climate-smart agriculture, watershed management, indigenous water conservation, and sustainable land restoration by integrating technical expertise with community-based religious networks. These experiences demonstrate that faith-based institutions complement government interventions by strengthening environmental awareness, community participation, and local ownership of adaptation programmes.

In Kenya, churches have become increasingly active in supporting climate adaptation, particularly in ASAL counties. Organizations such as the National Council of Churches of Kenya (NCCCK), the Anglican Church of Kenya (ACK), the Methodist Church in Kenya (MCK), and Catholic Relief Services (CRS) collaborate with national and county governments to

promote tree planting, water harvesting, conservation agriculture, environmental education, and drought-resilient livelihoods. These collaborations may take different forms, including project-based activities, joint community mobilization, technical support, and proposed or formalized planning arrangements. However, many collaborations remain project-based and may be constrained by weak institutional coordination, inconsistent funding, and limited policy integration.

Tharaka South Sub-County, located in Kenya's semi-arid eastern region, experiences recurrent droughts, erratic rainfall, declining soil fertility, and increasing water scarcity that undermine agricultural productivity and household livelihoods. Government agencies, churches, and local communities have implemented adaptation initiatives including drought-tolerant crops, water harvesting, afforestation, climate-awareness campaigns, and food-relief programmes. These initiatives indicate that collaborative adaptation is already present, but the extent to which actors coordinate, share resources, integrate different knowledge systems, and sustain interventions over time requires closer examination. Indigenous knowledge is particularly relevant in this setting because farmers and other community members have accumulated experience-based knowledge of weather indicators, crop selection, soil and water management, and local responses to climatic stress.

Although extensive literature exists on climate change adaptation and collaborative governance, relatively few empirical studies have examined church-government partnerships within Kenya's ASAL regions while simultaneously considering indigenous knowledge. Comparative evidence from Kitui and Tharaka South shows that farmers continue to use indigenous indicators alongside conventional climate information, and that

integrating the two knowledge systems can strengthen climate adaptation (Mugi-Ngenga et al., 2021). Studies from other dryland settings similarly demonstrate the importance of local knowledge, institutional support, extension services, and context-specific adaptation. Nevertheless, there remains limited empirical evidence on how faith-based institutions, government agencies, and indigenous knowledge interact within local collaborative governance arrangements. This gap is particularly important in Tharaka South, where adaptation initiatives operate within a semi-arid livelihood system and where the effectiveness of individual interventions may differ from the perceived value of integrated partnerships.

This study addresses this gap by examining church-government partnerships in fostering climate change adaptation in Tharaka South Sub-County. Specifically, it evaluates collaborative adaptation initiatives, assesses their effectiveness in enhancing community resilience, examines the influence of religious teachings on environmental awareness, identifies institutional challenges and opportunities affecting collaboration, and explores the contribution of indigenous knowledge to climate adaptation. By integrating quantitative and qualitative evidence, the study contributes to the growing body of knowledge on collaborative climate governance and provides practical recommendations for strengthening partnerships between faith-based organizations and government institutions in climate-vulnerable regions.

Problem Statement

Climate variability in Tharaka South poses persistent risks to rain-fed agriculture, water availability, environmental resources, and household livelihoods. Although government agencies, churches, and communities have implemented a range of adaptation activities, the

existence of separate initiatives does not necessarily demonstrate effective collaboration or improved resilience. The key problem is therefore not simply the absence of adaptation activities, but uncertainty about how institutional relationships, religious influence, indigenous knowledge, technical support, financing, and coordination mechanisms combine to shape perceived adaptation effectiveness. Existing literature provides useful evidence on government-led adaptation and the independent contribution of faith-based organizations, but comparatively less is known about the interaction of these actors at sub-county level in Kenya's ASALs. The study consequently sought to examine the character and effectiveness of church-government collaboration in Tharaka South while explicitly considering indigenous knowledge as a locally embedded component of climate governance.

Theoretical and Analytical Framework

The study integrates Polycentric Governance Theory, Social Capital Theory, Creation Stewardship, and Collaborative Governance Theory. Polycentric Governance Theory explains the presence of multiple actors and decision centres and emphasizes coordination among institutions with different forms of authority and expertise. Social Capital Theory explains how trust, networks, reciprocity, and shared norms can facilitate collective action and information exchange (Putnam, 2000). Creation stewardship provides a faith-based explanation for why religious teachings may motivate environmental responsibility, while Collaborative Governance Theory emphasizes shared planning, dialogue, clearly defined roles, and joint accountability among interdependent actors (Ansell & Gash, 2008).

The integrated framework treats indigenous knowledge as a community-embedded knowledge asset that can connect formal and

informal governance systems. In this framework, government institutions contribute technical expertise, public programmes, climate information, and extension services; churches contribute moral influence, social networks, mobilization, and community trust; and local communities contribute experiential knowledge, local ecological observation, and place-specific adaptation practices. The expected outcome is not that one actor necessarily outperforms the others, but that effective coordination can combine complementary strengths. Conversely, weak coordination, resource competition, political or institutional interests, inadequate financing, or limited technical capacity may reduce partnership effectiveness. The empirical results are therefore interpreted both as evidence of collaboration and as a test of whether collaboration translates into perceived adaptation effectiveness.

2.0 Materials and Methods

Study Area

The study was conducted in Tharaka South Sub-County, Tharaka Nithi County, Kenya, an Arid and Semi-Arid Land (ASAL) characterized by low and erratic rainfall, prolonged droughts, high temperatures, and recurrent crop failures. Agriculture, mainly rain-fed crop and livestock production, is the primary livelihood. Increasing climate variability has contributed to water scarcity, land degradation, declining agricultural productivity, and food insecurity, making the area suitable for examining church-government partnerships in climate change adaptation.

Research Design

A mixed-methods case study design integrating quantitative and qualitative approaches was adopted. The design enabled triangulation by combining statistical evidence with participants' experiences, providing a comprehensive

understanding of collaborative climate adaptation initiatives within their socio-cultural and institutional context.

Target Population and Sampling Procedure

The target population comprised community members, church leaders, government officers, opinion leaders, and other stakeholders involved in climate adaptation. Three wards Nkondi, Marimanti, and Turima were purposively selected because of their active church-government adaptation programmes and accessibility. The sampling strategy therefore focused on locations where the study phenomenon could be observed directly.

A multi-stage sampling procedure was employed. Purposive sampling identified opinion leaders and key informants involved in climate adaptation, including church leaders, agricultural extension officers, environmental officers, and community leaders. Stratified random sampling was then used to select household respondents across the three wards. Fisher's formula estimated a minimum sample size of 384 respondents; however, financial and logistical constraints resulted in a final sample of 133 respondents, comprising 116 community members and 17 opinion leaders. The reduction of the achieved sample limits the statistical power and generalizability of inferential results and is treated as a study limitation.

Data Collection Methods

Primary and secondary data were collected. Quantitative data were obtained using structured questionnaires capturing information on climate change awareness, participation in adaptation programmes, perceptions of church-government collaboration, institutional effectiveness, environmental stewardship, indigenous adaptation practices, and implementation challenges.

Qualitative data were collected through semi-structured interviews with government officials, church leaders, and community representatives, as well as focus group discussions that explored community experiences and helped interpret and validate survey findings. Secondary information was obtained through document review of government policies, church reports, and climate adaptation strategies. Field observations complemented these methods by documenting adaptation initiatives such as tree planting, water harvesting, and conservation farming. The available study record does not provide sufficiently detailed reporting of the number and size of all focus groups, interview duration, document inclusion criteria, or a standardized observation checklist; these reporting limitations are acknowledged explicitly rather than inferred retrospectively.

Data Analysis

Quantitative data were coded and analysed using descriptive and inferential statistics. Descriptive statistics (frequencies, percentages, means, and standard deviations) summarized respondent characteristics and perceptions. Inferential analyses included independent- and paired-sample t-tests, Pearson and Spearman correlations, Chi-square tests, and analysis of variance (ANOVA) to examine relationships, differences, and associations among adaptation variables. Statistical significance was set at $p < .05$. Because the achieved sample was substantially smaller than the Fisher-derived target, inferential findings are interpreted cautiously and emphasis is placed on effect direction, observed patterns, and convergence with qualitative evidence. Qualitative data from interviews and focus group discussions were transcribed, coded, and analysed using thematic content analysis. The analysis focused on recurring themes concerning collaboration, environmental stewardship, institutional constraints, adaptation effectiveness,

indigenous knowledge, and opportunities for strengthening partnerships. Emerging themes were integrated with quantitative findings to enhance interpretation and strengthen credibility through methodological triangulation.

Validity, Reliability, and Ethical Considerations

Content validity was enhanced through expert review of the questionnaire, while a pilot study improved clarity and reduced ambiguity. Reliability and trustworthiness were strengthened through triangulation of questionnaires, interviews, focus group discussions, document analysis, and field observations. The mixed-methods approach was used not to eliminate sampling limitations but to compare different forms of evidence and identify areas of convergence and divergence.

Ethical approval and institutional permissions were obtained before data collection. Participation was voluntary, with informed consent obtained from all respondents. Confidentiality and anonymity were maintained throughout the study by excluding personal identifiers, and the research adhered to the principles of beneficence, respect for persons, voluntary participation, and confidentiality.

3.0 Results and Discussion

Respondent Characteristics

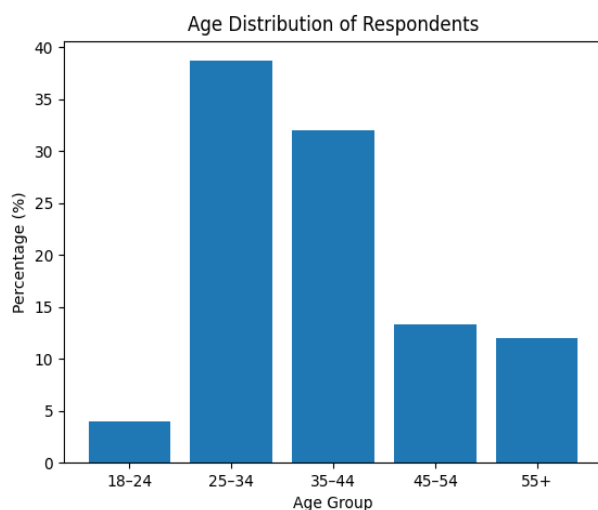
A total of 133 respondents participated in the study, including community members, church leaders, government officers, teachers, opinion leaders, and other stakeholders involved in climate change adaptation. Approximately 70% were aged 25–44 years, representing the economically active population responsible for implementing agricultural and environmental adaptation practices, while 25% were aged 45 years and above, contributing valuable indigenous knowledge. Gender representation

was balanced (49% male and 51% female). Farmers constituted the largest occupational group (31%), followed by business people (23%), government officers (15%), religious leaders (13%), teachers (11%), and others (7%).

The demographic composition reflects the key actors engaged in climate adaptation within Tharaka South. The predominance of farmers is consistent with the climate sensitivity of farming households in Kenya's ASALs. The balanced representation of women and men and the inclusion of older respondents provided perspectives relevant to both current adaptation practices and intergenerational indigenous ecological knowledge (Gebremedhin & Kassahun, 2020).

Figure 1

Age Distribution of Respondents (%)



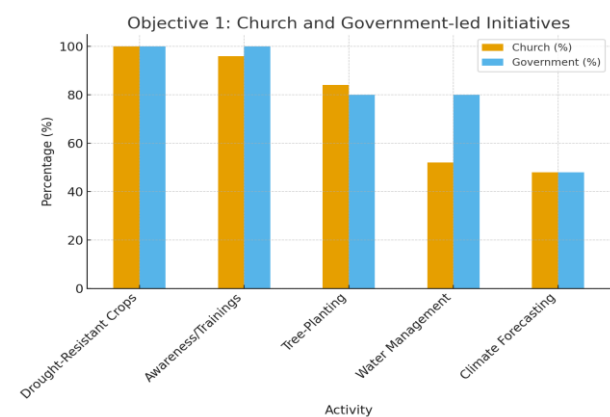
Collaborative Initiatives Between Churches and Government Agencies

The first objective examined collaborative initiatives implemented jointly by churches and government agencies to enhance climate change adaptation. The findings indicate substantial reported collaboration across several adaptation interventions. Church-led activities primarily focused on environmental awareness campaigns (96%), promotion of drought-resistant crops (100%), tree planting (84%), and water

harvesting (52%). Government agencies mainly supported food-relief programmes (100%), technical agricultural training (100%), distribution of drought-tolerant seed varieties (100%), water-management projects (80%), and dissemination of seasonal climate forecasts (48%). Overall, 96% of respondents confirmed the existence of active collaboration between churches and government institutions. These percentages should be interpreted as reported exposure or participation in activities rather than as independent measures of programme impact.

Figure 2

Church and Government-led Initiatives



The findings demonstrate that churches and government institutions generally perform complementary rather than identical roles in climate adaptation. Churches primarily mobilize communities, promote environmental stewardship through religious teachings, and facilitate participation, whereas government agencies contribute scientific knowledge, agricultural extension, technical training, climate information, and material support. This division of roles is consistent with polycentric governance, but it should not be interpreted as evidence of seamless institutional harmony. Collaborative arrangements may also be shaped by differences in mandates, resource access, influence, accountability, and priorities. The high reported collaboration therefore indicates an important governance platform, while the

lower effectiveness score for church-led activities shows that collaboration and intervention effectiveness are distinct concepts.

The findings are broadly consistent with evidence from the NCKK Green Congregations Programme, where churches have mobilized communities for environmental conservation while government actors provide technical guidance and extension services (NCKK, 2021; Gachanja & Muriuki, 2022). Similar patterns have been reported in Brazil's semi-arid Sertão region and in dryland settings in Ethiopia and Burkina Faso, where faith-based organizations have complemented technical interventions by leveraging social networks and moral authority. The present findings extend this literature by showing that strong reported collaboration can coexist with lower perceived effectiveness of church-led activities, suggesting that the value of churches may lie more in mobilization, trust, and social capital than in technical adaptation delivery alone.

The high level of reported collaboration suggests that faith-based institutions can act as local governance actors connecting policy implementation with community participation. Nevertheless, the relatively low dissemination of climate-forecast information points to an important coordination gap between technical agencies, extension officers, meteorological information systems, and churches. Strengthening these linkages may improve the conversion of scientific climate information into locally trusted early-warning and adaptation decisions.

Table 1

Mean Effectiveness of Climate Change Adaptation Interventions

Adaptation intervention	M	SD
Indigenous practices	2.48	0.77
Government interventions	1.92	0.28
Church interventions	1.50	0.51

Note. Effectiveness was measured on a 3-point scale, where 1 = low effectiveness and 3 = high effectiveness.

Perceived Effectiveness of Adaptation Interventions

The second objective evaluated respondents' perceptions of the effectiveness of church-led, government-led, and indigenous climate adaptation interventions. Indigenous adaptation practices recorded the highest perceived effectiveness ($M = 2.48$, $SD = 0.77$), followed by government interventions ($M = 1.92$, $SD = 0.28$), while church-led activities recorded the lowest mean ($M = 1.50$, $SD = 0.51$) (Table 1). The ordering is substantively important because it shows that respondents valued locally embedded practices more highly than either institutional category considered separately.

The reported paired-sample comparisons indicated significant differences between government and church interventions ($t = -3.50$, $p = .0019$), indigenous practices and government interventions ($t = 3.41$, $p = .0024$), and indigenous practices and church interventions ($t = 5.82$, $p < .001$). Pearson's correlation showed no statistically significant relationship between the breadth of church activities and perceived effectiveness ($r = -.047$, $p = .826$). In contrast, the reported correlation between government activities and perceived effectiveness ($r = .378$, $N = 133$) is statistically significant at the .05 level ($p < .001$). This result indicates a moderate positive association between government activity breadth and perceived effectiveness in the study sample.

The findings indicate that indigenous knowledge was perceived as the most effective adaptation mechanism in Tharaka South. Communities reported reliance on traditional weather forecasting, indigenous crop varieties, water harvesting, soil conservation, and locally adapted farming systems. The finding is consistent with comparative evidence from Tharaka South and Kitui Central, where farmers used indigenous indicators alongside conventional climate information and where the two knowledge systems showed useful convergence (Mugi-Ngenga et al., 2021). It also supports the wider argument that cultural knowledge can influence how climate risks are perceived and how adaptation options are selected (Adger et al., 2013).

Government interventions were perceived as more effective than church-led initiatives but less effective than indigenous practices. Government programmes provide technical expertise, improved seed varieties, extension services, climate information, and infrastructure, but their effectiveness may be constrained by inadequate funding, limited extension personnel, and sustainability challenges (Ministry of Environment and Forestry [MEF], 2018). The corrected correlation result further indicates that greater breadth of government activities was positively associated with perceived effectiveness, strengthening the interpretation that technical and institutional support matters for adaptation outcomes.

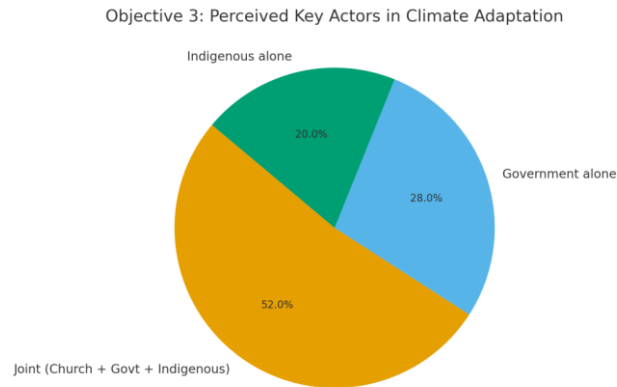
Church interventions primarily enhanced environmental awareness, community mobilization, and behavioural change rather than technical adaptation. This helps reconcile the apparently low church effectiveness score with the strong preference for integrated collaboration: respondents may value churches for their social and moral functions without regarding church-led activities as substitutes for

technical government services or indigenous practices. Consistent with Wakefield et al. (2021), faith-based organizations may achieve stronger adaptation outcomes when they work alongside scientific and public institutions. The findings therefore support an integrated polycentric interpretation in which churches, government agencies, and communities contribute different but potentially complementary resources.

Influence of Religious Teachings on Environmental Awareness and Community Participation

The third objective examined the influence of religious teachings on environmental awareness and community participation in climate change adaptation. Overall, 52% of respondents identified joint collaboration among churches, government institutions, and indigenous actors as the most effective approach, compared with 28% who preferred government interventions and 20% who favoured indigenous institutions. Chi-square analysis showed no significant association between church denomination and perceptions of adaptation effectiveness ($\chi^2 = 7.18$, $p = .305$), while ANOVA indicated no significant differences among denominations regarding church effectiveness ($F = 0.48$, $p = .702$). These results suggest broad similarity in perceptions across denominations, but they do not by themselves establish a causal effect of religious teaching on adaptation outcomes.

Figure 3
Perceived Key Actors in Climate Change Adaptation



The findings suggest that religious teachings may strengthen environmental awareness by framing conservation as a moral and spiritual responsibility, thereby supporting community acceptance of adaptation initiatives. This

interpretation is consistent with Creation Stewardship, which emphasizes responsible management of natural resources for present and future generations (Adler & Chan, 2022). The lack of significant denominational differences indicates broad support for environmental stewardship across the participating faith traditions. From a Social Capital perspective, trusted religious institutions may facilitate cooperation, information exchange, and collective action (Putnam, 2000). At the same time, these relationships should not be assumed to be conflict-free; differences in institutional interests, leadership, resources, or interpretations of public programmes can shape collaboration. The evidence therefore supports religious institutions as potential bridging actors rather than as automatically effective adaptation providers.

Table 2
Joint Display of Quantitative and Qualitative Findings

Quantitative evidence	Qualitative interpretation	Theoretical connection	Implication
96% reported active church-government collaboration.	Collaboration functions through complementary mobilization and technical roles.	Polycentric Governance.	Maintain coordination while clarifying institutional roles.
Indigenous practices had the highest perceived effectiveness (M = 2.48).	Locally adapted knowledge is viewed as relevant to semi-arid conditions.	Polycentric Governance + Social Capital.	Integrate indigenous and scientific knowledge.
Church interventions had the lowest mean (M = 1.50).	Church value appears strongest in awareness, mobilization, and behavioural support rather than technical delivery.	Creation Stewardship + Social Capital.	Avoid equating church presence with technical effectiveness.
52% preferred integrated church-government-indigenous collaboration.	Respondents favour combined institutional and community capacities.	Collaborative Governance.	Institutionalize joint planning and shared monitoring.

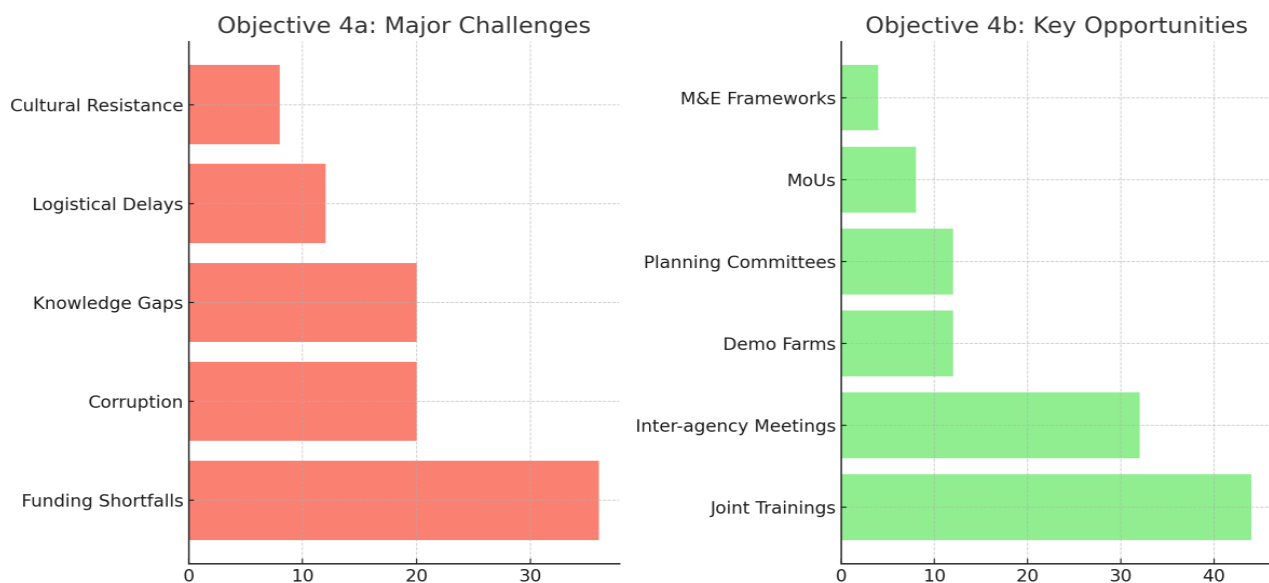
Challenges and Opportunities Affecting Church-Government Partnerships

The fourth objective identified challenges limiting church-government collaboration and opportunities for strengthening future partnerships. Funding constraints were the most frequently cited challenge (36%), followed by corruption and resource mismanagement (20%), inadequate technical knowledge and extension services (20%), logistical constraints (12%), and cultural

resistance (8%). Respondents identified joint capacity-building programmes (44%), regular inter-agency meetings (32%), demonstration farms (12%), formal planning committees (12%), Memoranda of Understanding (8%), and shared monitoring and evaluation systems (4%) as opportunities for improving collaboration (Figure 4). These findings point to institutional conditions that can influence whether collaboration translates into sustained adaptation practice.

Figure 4

Major Challenges and Opportunities Affecting Church-Government Partnerships



The findings indicate that inadequate funding remains the greatest reported obstacle to sustainable climate adaptation. Respondents' emphasis on capacity building and institutional coordination aligns with Kenya's Draft National Climate Change Action Plan (2023–2027), which promotes mechanisms for strengthening collaboration between public institutions and faith leaders (MEF, 2023). Similar evidence from dryland contexts emphasizes the importance of institutional coordination, community ownership, and sustained resources. These findings support Collaborative Governance Theory because shared planning, clearly defined institutional roles,

accountability, and continuing interaction are necessary where no single actor controls all resources required for adaptation (Ansell & Gash, 2008).

Strategies for Strengthening Church-Government Collaboration

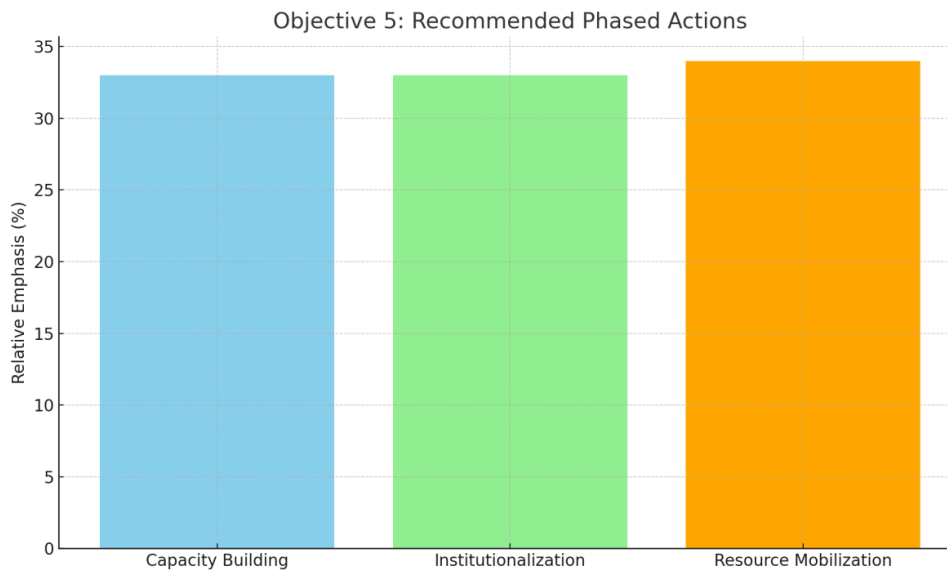
Respondents proposed a phased strategy comprising three mutually reinforcing components: capacity building, institutionalization, and resource mobilization (Figure 5). Capacity building emphasized integrated agricultural training, environmental education, and demonstration farms jointly managed by churches and government agencies.

Institutionalization focused on formal partnership agreements, joint planning committees, and shared monitoring frameworks. Resource mobilization emphasized integrating external resources with government budgets to finance water harvesting, drought-resilient agriculture, and community-based

adaptation projects. The proposed sequence is consistent with the study's broader finding that collaboration is most promising when social mobilization, technical capacity, local knowledge, and institutional resources are combined.

Figure 5

Recommended Phased Actions



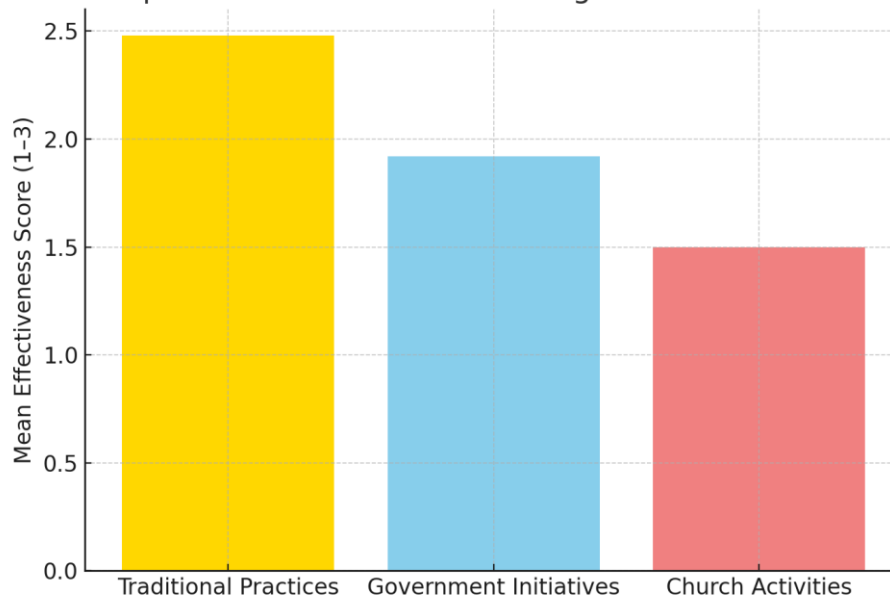
These recommendations align with collaborative adaptation principles emphasizing community ownership, institutional coordination, and long-term financing. Kenya's Climate Change Act (2016) provides a policy basis for participatory governance involving public institutions, local communities, and civil society organizations. Formalizing selected partnerships could therefore move existing project-based collaboration toward more durable institutional arrangements, while still allowing local actors to adapt mechanisms to ward and community contexts.

Contribution of Indigenous Knowledge to Climate Change Adaptation

The final objective assessed the contribution of indigenous knowledge to climate adaptation. Indigenous practices recorded the highest perceived effectiveness, outperforming the reported government- and church-led interventions. Traditional weather forecasting, drought-resistant local crop varieties, soil conservation, and water harvesting were perceived as reliable adaptation strategies. Spearman correlation showed no significant relationship between frequency of use and perceived effectiveness ($r = -.24$, $p = .26$), suggesting that perceived effectiveness may depend more on contextual suitability than on frequency of application alone.

Figure 6

Comparative Effectiveness of Indigenous vs. Institutional Practices



The findings indicate that indigenous ecological knowledge remains an important component of resilience in climate-vulnerable communities because it has evolved through long-term interaction with local environmental conditions (Gebremedhin & Kassahun, 2020). Comparative evidence from Tharaka South and Kitui Central similarly demonstrates continued use of indigenous climate indicators and the value of integrating them with conventional climate information (Mugi-Ngenga et al., 2021). Evidence from other dryland settings also points to the value of combining local knowledge with scientific extension and institutional support (Ali & Ayana, 2022). The implication is not that indigenous knowledge should replace scientific knowledge, but that adaptation planning should create legitimate spaces for the two knowledge systems to interact.

Study Limitations

First, Fisher's formula produced a minimum target of 384 respondents, but only 133 participated because of financial and logistical constraints. The reduced sample limits statistical power and the generalizability of inferential findings, and the study should

therefore be interpreted as a context-specific case rather than a statistically representative estimate for all ASAL communities. The cross-sectional case-study design identifies associations and perceived effectiveness but does not establish causal effects of church-government partnerships on climate resilience. Nevertheless, triangulation across survey, interview, focus-group, document, and observation evidence provides useful contextual insight into collaborative climate governance in Tharaka South.

4.0 Conclusion

This study examined the role of church-government partnerships in climate change adaptation in Tharaka South Sub-County, where climate variability threatens agricultural productivity, water security, and rural livelihoods. The evidence demonstrates substantial reported collaboration between churches and government institutions, but it also shows that collaboration should not be equated automatically with intervention effectiveness. Indigenous practices received the highest perceived effectiveness rating, government interventions ranked second, and church-led

interventions ranked lowest when considered separately.

Churches appear to contribute most strongly through environmental awareness, social mobilization, stewardship messaging, and community participation, while government agencies provide technical expertise, agricultural extension, climate information, seed and other material support. These complementary functions are consistent with a polycentric and collaborative governance interpretation. The corrected correlation analysis also indicates a significant positive association between the breadth of government activities and perceived effectiveness, while breadth of church activities was not significantly associated with perceived effectiveness.

The study further established that indigenous knowledge was perceived as the most effective adaptation resource. Traditional weather forecasting, drought-resistant cropping, soil conservation, and water harvesting remain relevant because of their local fit and accumulated experiential value. Rather than treating indigenous and scientific knowledge as competing systems, climate governance should provide mechanisms for their systematic integration.

Despite strong reported collaboration, effectiveness is constrained by inadequate funding, weak coordination, limited technical capacity, logistical challenges, and the absence of sufficiently formalized partnership mechanisms. The evidence therefore supports institutionalizing coordination and joint planning, but not on the assumption that expanding church-led activities alone will improve resilience. Instead, durable partnerships should combine the social capital and mobilization capacity of churches, the technical and institutional resources of

government, and the contextual knowledge of local communities.

Overall, the study contributes context-specific empirical evidence to discussions of collaborative climate governance by showing that partnership strength and intervention effectiveness are related but distinct dimensions. Its principal contribution is the proposition that semi-arid adaptation is more likely to be sustainable when institutional coordination creates space for complementary roles, indigenous knowledge, community participation, technical support, and reliable financing.

5.0 Recommendations

Policy and Institutional Strengthening

The Government of Kenya and County Governments should institutionalize appropriate church-government collaboration through policy and operational frameworks that recognize faith-based organizations as strategic partners while preserving clear public-sector accountability. Formal mechanisms such as Memoranda of Understanding, joint planning committees, shared monitoring systems, and agreed communication channels should be established where they add value. Such mechanisms should define roles, responsibilities, financing arrangements, reporting requirements, and dispute-resolution procedures.

Capacity Building and Indigenous Knowledge

Joint training programmes should strengthen the capacity of church leaders, extension officers, and community volunteers in climate-smart agriculture, environmental stewardship, disaster preparedness, climate information use, and participatory governance. Indigenous knowledge including weather forecasting, soil conservation, drought management, and locally adapted farming practices should be

documented with community participation and integrated critically with scientific approaches rather than simply appended to existing programmes.

Community Participation and Resource Mobilization

Climate adaptation programmes should actively involve local communities in planning, implementation, monitoring, and evaluation while leveraging church networks to promote environmental awareness and collective action. County governments, faith-based organizations, development partners, and the private sector should mobilize resources for water harvesting, afforestation, climate-information services, and drought-resilient agriculture. Financing

arrangements should prioritize continuity beyond short project cycles and should include transparent monitoring of resource use.

Future Research

Further studies should use larger samples and longitudinal designs to evaluate the long-term effects and economic benefits of church-government partnerships. Comparative studies across Kitui, Isiolo, Marsabit, and other ASAL settings would help establish which institutional mechanisms are context-specific and which are transferable. Future research should also examine gender and youth participation, digital climate-information systems, financing mechanisms, and the measurable contribution of indigenous knowledge to adaptation outcomes.

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