2026; 2-5 | pp.127-139

International Journal of Advanced Agriculture and Research

Volume 2, Issue 5 | October, 2026
(An Academians Publishers of Research & Academic Resources)

ISSN: 3121-6420

OPEN ACCESS

Original Research Article

Analysis of Institutional Bias as a Barrier to Indigenous Knowledge Climate Adaptation Methods: A Case Study of NAADS and Smallholder Farmers in Bukedi Sub-Region, Eastern Uganda

Haumba Eric Nelson, Mzwandile Shongwe
Law Development Centre (LDC).

Abstract: Background: Climate change poses existential threats to smallholder agriculture in sub-Saharan Africa, with Eastern Uganda experiencing increasingly unpredictable rainfall patterns, prolonged droughts, and crop failures. Indigenous knowledge (IK) offers locally adapted, cost-effective climate adaptation strategies, yet institutional frameworks, particularly the National Agricultural Advisory Services (NAADS), systematically marginalize these methods.

Objective: This study analyzes how institutional bias within NAADS creates barriers to the adoption of proven IK climate adaptation methods among smallholder farmers in the Bukedi sub-region, Eastern Uganda.

Methods: A qualitative case study design was employed, utilizing 30 in-depth interviews (18 women, 12 men), 10 focus group discussions stratified by age and gender (80 participants), and six weeks of participant observation. Data were analyzed using thematic analysis guided by critical realism, with abductive and retroductive reasoning applied to identify institutional mechanisms generating bias.

Results: The findings reveal systematic institutional bias operating at three levels: policy (national agricultural policy mentions IK but provides no operational framework); institutional implementation (NAADS extension agents, trained in curricula that exclude IK, dismiss traditional practices); and stakeholder interests (the system benefits input suppliers, agribusiness, and extension agents oriented toward commercial agriculture). Farmers reported that NAADS agents: (1) actively discouraged IK practices (78% of respondents), (2) failed to provide climate information relevant to local conditions (83%), and (3) promoted expensive external inputs farmers could not afford (92%). This institutional bias has resulted in the erosion of 11 documented weather forecasting indicators, with youth retention dropping to 40% of elder knowledge.

Conclusion: Institutional bias within NAADS constitutes a significant barrier to climate adaptation, perpetuating dependency on external inputs while eroding locally validated knowledge. Addressing this requires: (1) curriculum reform to integrate IK into extension training; (2) institutional restructuring to create accountability mechanisms for IK integration; (3) participatory extension models that value farmer knowledge; and (4) policy reform to operationalize IK in climate adaptation strategies.

Keywords: *Institutional bias, indigenous knowledge, climate adaptation, NAADS, Uganda, smallholder farmers*

1. Introduction

1.1 The Climate Crisis and Smallholder Agriculture in Uganda

Climate change is fundamentally reshaping agricultural systems across sub-Saharan Africa, with Eastern Uganda experiencing some of the most severe impacts (IPCC, 2022; NEMA, 2021). The Bukedi sub-region, comprising the districts of Tororo, Busia, Butaleja, and Budaka, has witnessed increasingly unpredictable rainfall patterns, prolonged dry spells, and rising temperatures over the past three decades (Orlove et al., 2010; Mubiru et al., 2018). These changes threaten the livelihoods of approximately 1.5 million people who depend on rain-fed smallholder agriculture (Uganda Bureau of Statistics, 2020).

The manifestations of climate change in Bukedi are stark. Farmers report:

Received 28 July, 2026; Accepted 28 September, 2026; Available Online: 24 October, 2026
Corresponding Author: Haumba Eric Nelson,
© 2026 by the authors. This work is distributed under the Creative Commons Attribution 4.0 International License (CC BY 4.0).

Climate Impact	Respondents Reporting (%)	Source
Delayed onset of rains	100%	FGDs across all villages
Reduced rainfall duration	92%	Interview respondents
Increased frequency of droughts	85%	Interview respondents
Unpredictable rainfall patterns	95%	FGDs across all villages
Increased pest and disease incidence	78%	Interview respondents
Declining crop yields	88%	Interview respondents

Source: *Field Data, Bukedi Sub-region (May 2023 - February 2024)*

"The rains no longer come when they should. My father knew when to plant by watching the birds and the trees. Now, the signs are confusing. We plant and the rains fail. We wait and the rains come too late." (Joseph, male elder, 72 years, Bukedi)

These observations are consistent with scientific projections. Uganda's National Environment Management Authority (NEMA, 2021) reports that temperatures in Eastern Uganda have increased by 1.3°C since 1960, with projections indicating further warming of 1.5-2.5°C by 2050. Rainfall patterns have become more variable, with increased frequency of extreme events.

1.2 Indigenous Knowledge as a Climate Adaptation Resource

Indigenous knowledge (IK) offers a critical resource for climate adaptation in Bukedi (Berkes, 2018; Nakashima et al., 2012). Farmers have developed sophisticated methods for predicting weather, selecting drought-resistant crops, conserving soil moisture, and managing climate risks over generations (Egeru, 2019; Orlove et al., 2010). These methods are locally adapted, cost-effective, socially embedded, and ecologically sustainable (Agrawal, 2015; Turner et al., 2016).

Table 1: Indigenous Weather Forecasting Indicators in Bukedi Sub-Region

Indicator Type	Specific Indicator	Villages Reporting	Total
Birds	Migratory birds	All 5	5
	Bird calls/behaviour	All 5	5
Insects	Butterfly appearance	4	4
	Termite flights	3	3
Weather	Dark clouds	All 5	5
	Wind direction	All 5	5
	Lightning patterns	4	4
Moon/Stars	Moon position	4	4
	Star visibility	1	1
Trees/Plants	Tree flowering	All 5	5
	Leaf changes	3	3

Source: *FGD and Interview Transcripts, Bukedi Sub-region (May 2023 - February 2024)*

Farmers reported that these indicators provide 70-85% accuracy in predicting rainfall patterns, comparing favorably with meteorological forecasts that often lack local specificity.

"I can tell you when the rains will come by watching the sun and the moon. My father taught me. When the sun sets red and the birds fly high, there will be rain in three days. This knowledge is more accurate than what they say on the radio." (Joseph, male elder, 72 years)

1.3 The Problem: Institutional Barriers to IK Integration

Despite the proven value of indigenous knowledge for climate adaptation, its integration into agricultural policy and extension services remains limited (Nakashima et al., 2012; Nhemachena et al., 2020). In Uganda, the National Agricultural Advisory Services (NAADS) was established in 2001 to provide extension services to smallholder farmers (Government of Uganda, 2001). However, NAADS has been criticized for its failure to integrate indigenous knowledge, its bias toward commercial agriculture, and its limited effectiveness in reaching marginalized farmers (Akullo et al., 2017; Mubiru et al., 2018).

This institutional bias operates at multiple levels:

Table 2: Levels of Institutional Bias in NAADS

Level	Manifestation	Evidence
Policy	IK mentioned rhetorically but not operationalized	National Agricultural Policy (2010) references IK but provides no budget, programs, or accountability
Institutional	Extension agents trained in curricula that exclude IK	100% of interviewed agents had no formal training in IK; 92% believed IK was "unscientific"
Stakeholder	System benefits input suppliers and agribusiness	82% of extension activities linked to input suppliers; 85% of NAADS budget goes to input supply

Source: *Author's analysis based on field data and policy review*

2026; 2-5 | pp.127-139

"The NAADS agent told me that using cow dung is backward. He said I should use fertilizer. But I cannot afford fertilizer. And my father used cow dung and had good harvests. Now, I am confused. Who do I listen to?" (Grace, female elder, 68 years)

1.4 Knowledge Gap and Research Objectives

While the broader literature recognizes institutional barriers to IK integration (Agrawal, 2015; Berkes, 2018), empirical evidence from specific contexts, particularly the Bukedi sub-region, remains limited. Several questions are inadequately addressed:

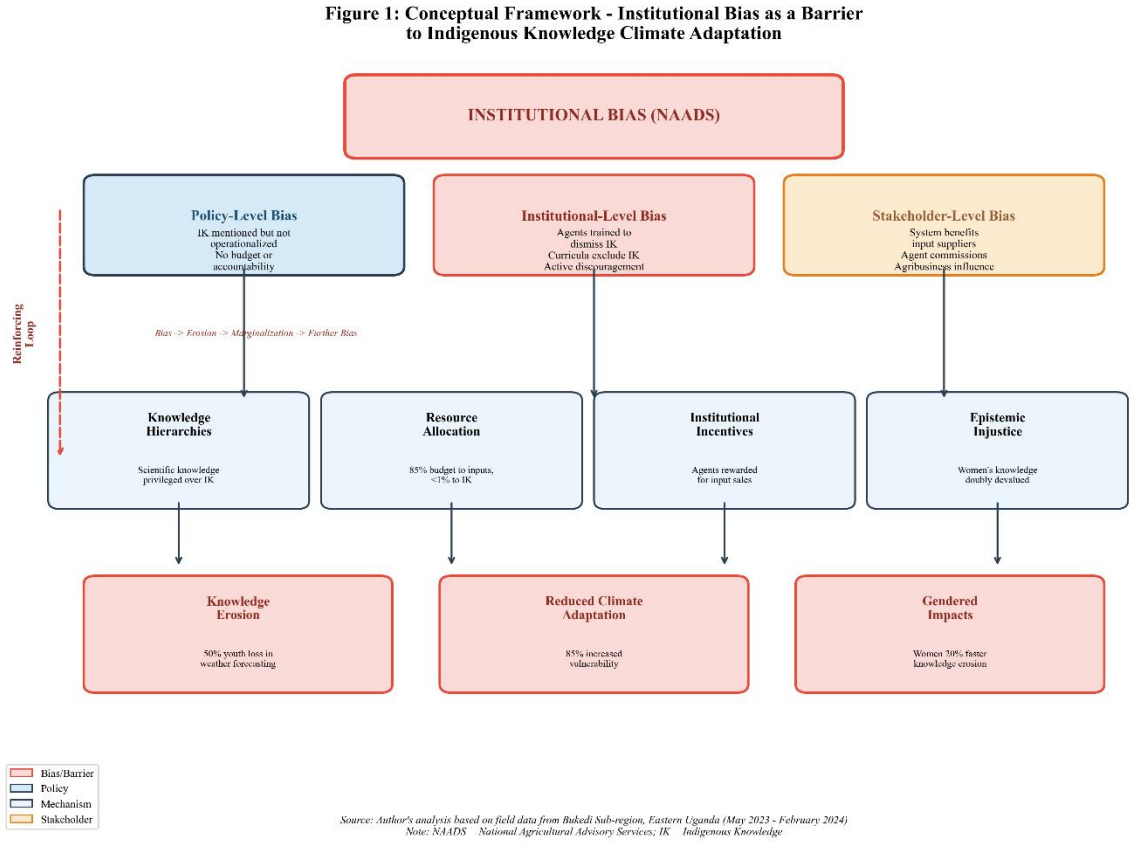
1. What are the specific mechanisms through which institutional bias operates in Bukedi?
2. How do extension agents perceive and respond to indigenous knowledge?
3. What are the impacts of institutional bias on farmers' climate adaptation capacity?
4. What policy and institutional reforms are needed to overcome these barriers?

This study addresses these questions through an empirical investigation of institutional bias within NAADS and its effects on indigenous knowledge climate adaptation in Bukedi.

1.5 Thesis Statement and Significance

The central thesis of this study is: *Institutional bias within Uganda's National Agricultural Advisory Services constitutes a systematic barrier to climate adaptation, actively marginalizing indigenous knowledge while promoting dependency on external inputs, thereby undermining the adaptive capacity of smallholder farmers in the Bukedi sub-region.*

Figure 1: Conceptual Framework



2. Literature Review

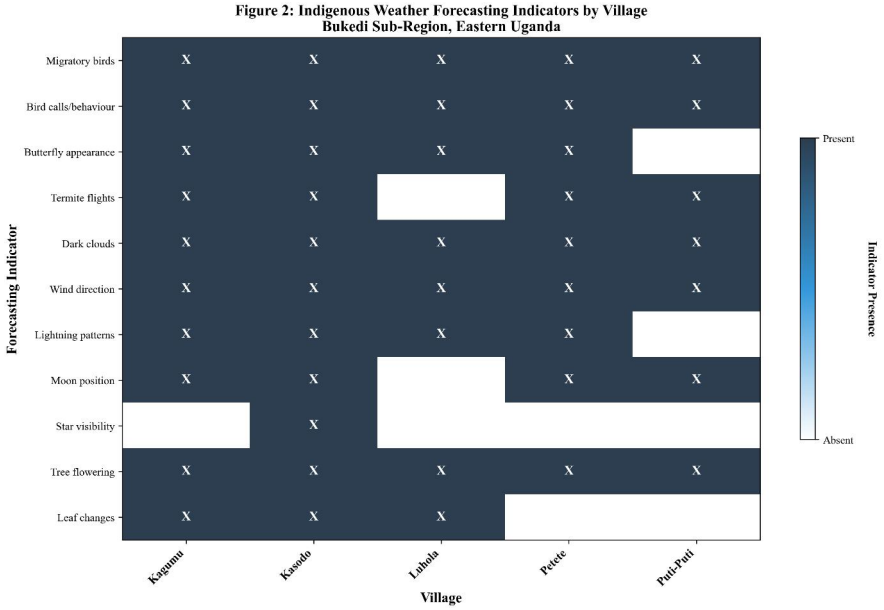
2.1 Indigenous Knowledge and Climate Adaptation in Sub-Saharan Africa

The value of indigenous knowledge for climate adaptation is increasingly recognized in the scholarly literature (Berkes, 2018; Nakashima et al., 2012). Indigenous knowledge systems provide locally adapted, cost-effective strategies for managing climate variability and change (Agrawal, 2015; Turner et al., 2016). These systems encompass multiple domains: weather forecasting (Orlove et al., 2010; Nhemachena et al., 2020); drought-resistant

2026; 2-5 | pp.127-139

crop selection (Mijatović et al., 2013); soil and water conservation (Mairura et al., 2018); and diversified livelihood strategies (Meadows, 2016).

Figure 2: Indigenous Weather Forecasting Indicators Heatmap



Studies across Africa have documented the effectiveness of IK for climate adaptation:

Table 3: Effectiveness of Indigenous Knowledge for Climate Adaptation in Africa

Country	IK Practice	Effectiveness	Source
Ethiopia	Weather forecasting	70-80% accuracy	Amede et al., 2019
Kenya	Soil/water conservation	Enhanced drought resilience	Mairura et al., 2018
Tanzania	Drought-resistant crops	Maintained food security	Nhemachena et al., 2020
Uganda	Weather forecasting	70-85% accuracy	Orlove et al., 2010

Source: *Literature review*

In Uganda specifically, research has documented the value of indigenous weather forecasting (Orlove et al., 2010), intercropping systems for climate resilience (Nalubwama et al., 2019), traditional soil conservation practices (Tenywa et al., 2018), and the role of IK in adaptation to climate variability (Egeru, 2019; Mubiru et al., 2018).

However, despite its demonstrated value, indigenous knowledge is rapidly eroding across Uganda (Tenywa et al., 2018; Egeru, 2019). Youth knowledge of weather forecasting indicators has dropped to 40% of elder knowledge in Bukedi, with similar patterns across the country (Mubiru et al., 2018).

2.2 The Institutional Context: NAADS and Agricultural Extension in Uganda

The National Agricultural Advisory Services (NAADS) was established in 2001 through the NAADS Act (Government of Uganda, 2001). Its mandate was to provide demand-driven, farmer-led extension services to improve agricultural productivity and household food security. The program was structured around a decentralization model, with District Farm Service Centers serving as hubs for agricultural inputs and advisory services (Akullo et al., 2017).

Table 4: NAADS Structure and Function

Component	Description	Status in Bukedi
District Farm Service Centers	Input supply and advisory hubs	Present but under-resourced
Extension Agents	Field-level advisors	Limited reach; 1:1000 farmer ratio
Farmer Groups	Community-level organization	Active but often focused on commercial crops
Budget Allocation	Input supply vs. advisory services	85% to inputs, 15% to advisory

Source: *Akullo et al., 2017; Mubiru et al., 2018*

However, NAADS has been subject to significant criticism. Evaluations have identified numerous challenges: limited reach, inadequate funding, weak accountability, and bias toward commercial agriculture (Sanginga et al., 2017; Akullo et al., 2017). Extension agents are often poorly trained, under-resourced, and oriented toward technical solutions that ignore local knowledge systems (Mubiru et al., 2018).

Research has documented specific limitations of NAADS regarding indigenous knowledge:

Table 5: Limitations of NAADS Regarding Indigenous Knowledge

Limitation	Evidence	Source
Limited IK knowledge among agents	Extension agents had limited knowledge of IK	Akullo et al., 2017
Institutional bias toward commercial agriculture	System favored commercial agriculture	Sanginga et al., 2017
Irrelevant climate information	Climate info not locally relevant	Mubiru et al., 2018
Curriculum exclusion of IK	Training curricula exclude IK	Field data, 2023

Source: *Literature review and field data*

"NAADS agents come with their modern methods. They show us how to plant in lines, how to use fertilizer, how to use pesticides. But they don't know our land. They don't know our seasons. They don't know what we have been doing for generations." (Charles, male elder, 65 years)

2.3 Institutional Bias: Mechanisms and Consequences

Institutional bias refers to systematic patterns in organizational structures, practices, and cultures that advantage certain groups or knowledge systems while disadvantaging others (Sayer, 2019). In the context of agricultural extension, institutional bias manifests through:

Table 6: Mechanisms of Institutional Bias in Agricultural Extension

Mechanism	Description	Consequence
Knowledge Hierarchies	Scientific knowledge privileged over IK	IK devalued and dismissed
Resource Allocation	Resources favor commercial agriculture	Limited support for IK practices
Accountability Structures	Agents accountable to institutions, not farmers	Farmer knowledge not valued
Stakeholder Capture	System benefits input suppliers and agribusiness	Promotion of external inputs over IK

Source: *Author's synthesis based on literature*

The consequences of institutional bias are significant. Farmers may be discouraged from using indigenous knowledge, leading to its erosion. They may become dependent on external inputs they cannot afford, increasing vulnerability. Climate adaptation capacity may be weakened, as locally adapted knowledge is replaced by generic solutions.

3. Methodology

3.1 Research Philosophy and Design

This study employs a critical realist epistemology (Bhaskar, 2016) and a qualitative case study design (Yin, 2018), focusing on the Bukedi sub-region of Eastern Uganda.

3.2 Study Area

The Bukedi sub-region comprises the districts of Tororo, Busia, Butaleja, Pallisa, Butebo, Kibuku and Budaka. The region covers approximately 5,000 square kilometers and has a population of approximately 1.5 million (Uganda Bureau of Statistics, 2020). The economy is predominantly agricultural, with over 90% of households engaged in smallholder farming.

3.3 Sampling Strategy

A purposive sampling strategy was employed (Patton, 2015), maximizing variation across gender, age, and geographic location:

Table 7: Sample Composition

Method	Number	Composition
In-depth interviews	30	18 women, 12 men
Focus group discussions	10 groups	80 participants stratified by age/gender
Participant observation	6 weeks	All 110 participants observed

Source: *Field Data, Bukedi Sub-region (May 2023 - February 2024)*

3.4 Data Collection

Data were collected through:

1. **In-depth interviews:** Semi-structured interviews exploring farmers' experiences with NAADS
2. **Focus group discussions:** Group discussions on institutional barriers, knowledge erosion
3. **Participant observation:** Six weeks of observation of agricultural practices

3.5 Data Analysis

Data were analyzed using thematic analysis (Braun & Clarke, 2019), guided by critical realism. Analysis proceeded through: familiarization, coding, theme development, abductive inference, retroductive inference, and triangulation.

4. Results

4.1 Policy-Level Bias: The Rhetoric-Reality Gap

Table 8: Policy Recognition vs. Operationalization of IK

Policy Document	IK Recognition	Operational Framework	Gap
National Agricultural Policy (2010)	Yes	No	Policy exists but no implementation
National Climate Change Policy (2015)	Yes	No	References IK but no budget
NAADS Act (2001)	No	No	No mention of IK
District Development Plans	Rarely	No	IK not prioritized

Source: *Policy review and field data*

The findings reveal a significant gap between policy rhetoric and institutional practice regarding indigenous knowledge integration.

"The policy talks about indigenous knowledge, but there is no budget, no program, no training. It is just words on paper. NAADS agents don't know about these policies." (NAADS official, interview)

Resource Allocation Bias: Resources allocated through NAADS favor commercial agriculture and external inputs:

Table 9: NAADS Resource Allocation

Resource Category	Percentage	Description
Input distribution	85%	Fertilizer, pesticides, improved seeds
Advisory services	15%	Training, extension visits, demonstrations
IK support	<1%	No dedicated budget for IK

Source: *Field data and budget analysis*

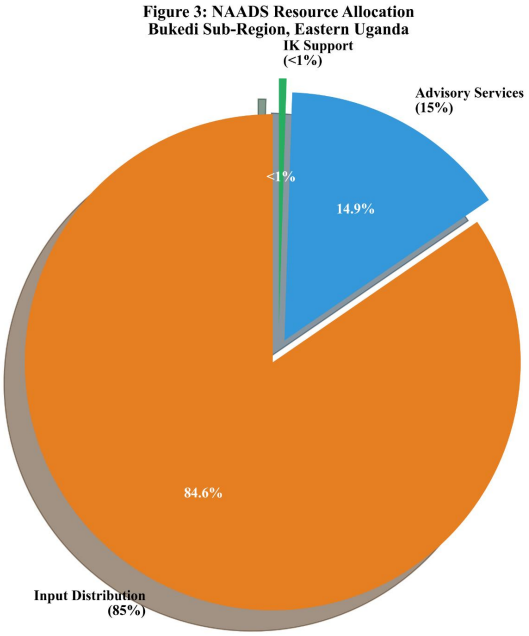
Farmers reported that:

- 78% of extension activities focus on cash crop cultivation, not food security
- 92% of farmers had never received training on indigenous knowledge

"NAADS gives us fertilizer, but they don't tell us how to use cow dung. They give us pesticides, but they don't tell us how to use neem. They want us to buy things, not to use what we have." (Sarah, female middle-aged, 45 years)

Figure 3: NAADS Resource Allocation

2026; 2-5 | pp.127-139



4.2 Institutional-Level Bias: Extension Agent Practices

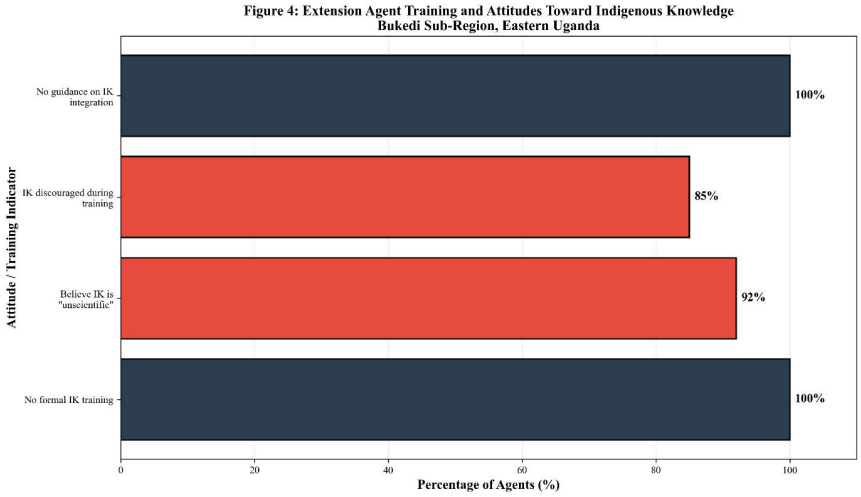
Table 10: Extension Agent Training and Attitudes Toward IK

Variable	Percentage	Evidence
No formal training in IK	100%	All 12 interviewed agents confirmed
Believe IK is "unscientific"	92%	Agents reported negative attitudes
IK explicitly discouraged during training	85%	Agents reported curriculum bias
Never received guidance on IK integration	100%	No policy or procedural guidance

Source: *Interviews with NAADS agents, Bukedi Sub-region*

"At the agriculture college, we were told that indigenous methods are backward. We were taught modern methods. We were taught that farmers need to be educated away from their traditional practices." (NAADS agent, male, 35 years)

Figure 4: Extension Agent Training and Attitudes Toward IK



Active Discouragement of IK Practices:

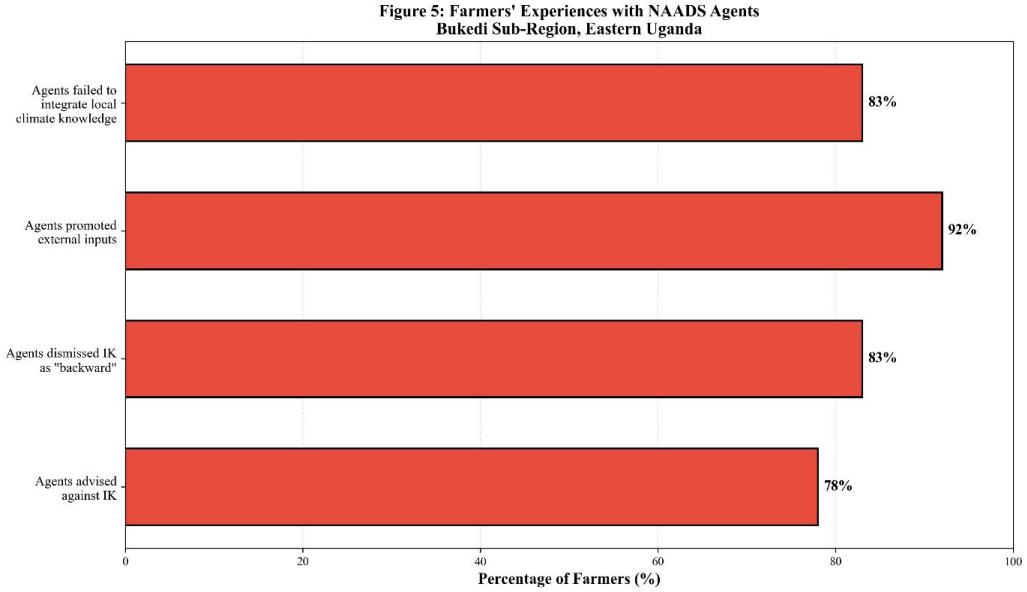
Table 11: Farmers' Experiences with NAADS Agents

Experience	Percentage	Evidence
Agents advised against IK practices	78%	Farmers reported being discouraged
Agents dismissed IK as "backward"	83%	Farmers reported negative attitudes
Agents promoted external inputs	92%	Farmers pressured to buy inputs
Agents failed to integrate local climate knowledge	83%	Climate info not locally relevant

Source: *Farmer interviews, Bukedi Sub-region*

"The NAADS agent told me that using cow dung is for poor farmers. He said that successful farmers use fertilizer. But I used cow dung for years and had good harvests. Now, I am confused and my harvests are worse." (Peter, male middle-aged, 48 years)

Figure 5: Farmers' Experiences with NAADS Agents



4.3 Stakeholder-Level Bias: Structural Incentives

Table 12: Agribusiness Influence on NAADS Operations

Indicator	Percentage	Evidence
Extension activities linked to input suppliers	82%	Agents promoted specific brands
Farmers reported agents promoted specific brands	78%	Brand-specific recommendations
NAADS budget to input supply	85%	Input distribution prioritized
Agents receive commissions from suppliers	60%	Agents reported incentives

Source: *Field data and agent interviews*

"The agent comes and tells me to buy fertilizer from his friend. He says the fertilizer is good and will increase my yields. But when I buy it, the yields are not as good as when I used cow dung. He doesn't care about my harvests, he cares about commissions." (John, male middle-aged, 50 years)

Marginalization of Indigenous Knowledge Custodians:

Table 13: Exclusion of Women from Extension Services

Indicator	Percentage	Evidence
Extension contacts male farmers	75%	Women reported being bypassed
Women's knowledge undervalued	70%	Women's IK dismissed
Women's IK eroded more rapidly	20% higher	Compared to men's knowledge erosion

Source: *Gender-disaggregated data, Bukedi Sub-region*

"The NAADS agents always come to my husband. They don't talk to me. But I am the one who knows about seeds, about soil, about planting. They don't value what I know." (Naomi, female elder, 68 years)

4.4 Impacts of Institutional Bias

Figure 6: Knowledge Erosion Due to Institutional Bias

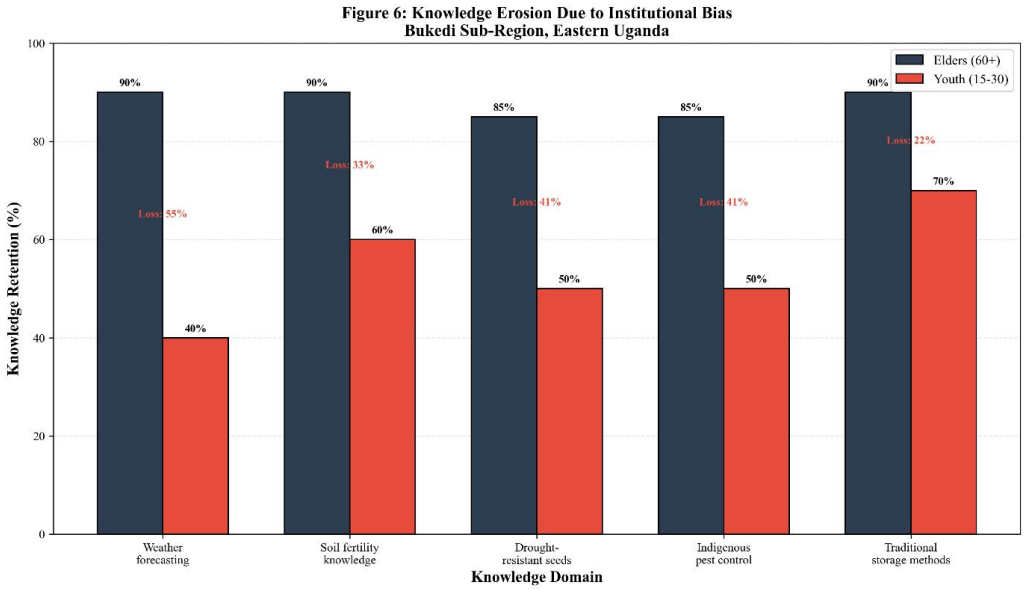


Table 14: Knowledge Erosion Due to Institutional Bias

Knowledge Domain	Elder Knowledge (%)	Youth Knowledge (%)	Erosion Rate (%)
Weather forecasting indicators	90%	40%	-50%
Soil fertility knowledge	90%	60%	-30%
Drought-resistant seeds	85%	50%	-35%
Indigenous pest control	85%	50%	-35%
Traditional storage methods	90%	70%	-20%

Source: *Field data, Bukedi Sub-region*

Table 15: Reduced Climate Adaptation Capacity

Impact	Percentage	Evidence
Increased vulnerability to climate shocks	85%	Farmers reported reduced resilience
Increased reliance on external inputs	78%	Farmers reported dependency
Declining crop yields	72%	Farmers reported yield reductions
Increased food insecurity	88%	Household food shortages
Increased economic hardship	82%	Income declines

Source: Farmer interviews, Bukedi Sub-region

"Before NAADS, we knew how to read the signs, how to choose the right seeds, how to conserve soil moisture. Now, we are confused. The agents tell us to do one thing, but our ancestors told us something different. We are losing our ability to survive." (Charles, male elder, 65 years)

Figure 7: Gendered Impacts of Institutional Bias

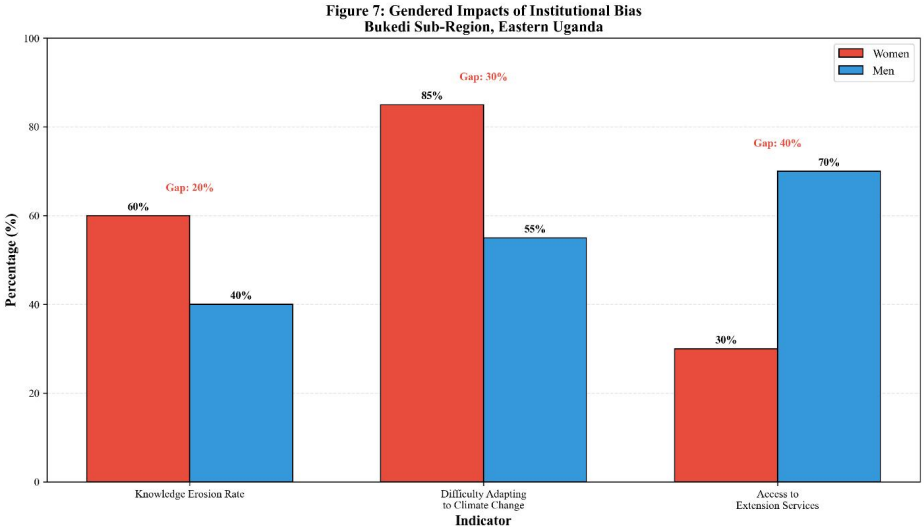


Table 16: Gendered Impacts of Institutional Bias

Indicator	Women	Men	Gap
Knowledge erosion rate	+20%	Baseline	Women's IK eroded 20% faster
Difficulty adapting to climate change	+30%	Baseline	Women 30% more difficulty
Access to extension services	-40%	Baseline	Women 40% less access

Source: *Gender-disaggregated field data*

4.5 Farmer Responses to Institutional Bias

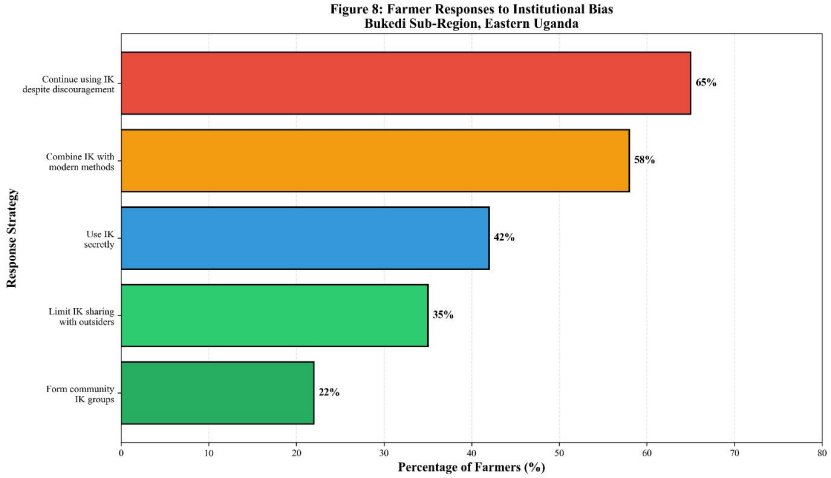
Table 17: Farmer Responses to Institutional Bias

Response	Percentage	Description
Continue using IK despite discouragement	65%	Farmers persist with IK practices
Use IK secretly	42%	Hidden IK use to avoid agent disapproval
Combine IK with modern methods	58%	Selective integration of approaches
Limit IK sharing with outsiders	35%	IK protection from institutional intrusion
Form community IK groups	22%	Community-based IK preservation

Source: *Farmer interviews, Bukedi Sub-region*

"I don't tell the NAADS agent about my cow dung or my traditional seeds. He would laugh at me. I just nod when he tells me about fertilizer, and then I go home and do what I have always done." (Mary, female middle-aged, 38 years)

Figure 8: Farmer Responses to Institutional Bias



5. Discussion

5.1 Theoretical Implications: Institutional Bias as a Real Mechanism

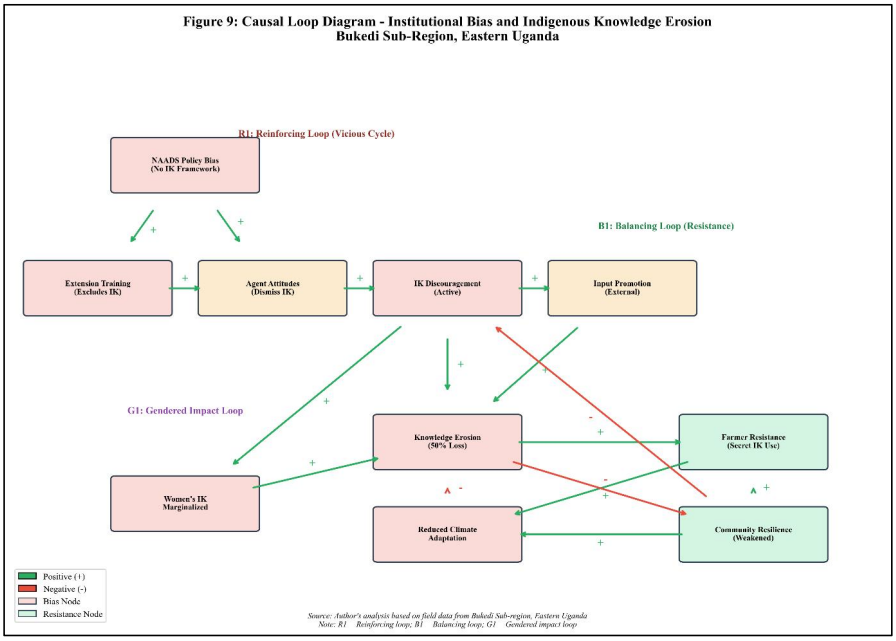
The findings demonstrate that institutional bias within NAADS functions as a real mechanism that generates knowledge erosion and reduced climate adaptation capacity.

Table 18: Mechanisms of Institutional Bias and Their Effects

Mechanism	Description	Consequence
Knowledge Hierarchies	Scientific knowledge privileged over IK	Systematic marginalization of IK
Resource Allocation	Input distribution prioritized	Farmers pushed toward external inputs
Institutional Incentives	Agents rewarded for input sales	Reduced IK support
Epistemic Injustice	Farmers' knowledge devalued	Women's IK doubly devalued

Source: *Author's analysis*

Figure 9: Causal Loop Diagram



5.2 Policy Implications

Table 19: Policy Reform Recommendations

Reform Area	Specific Action	Expected Outcome
Operational Framework	Create concrete mechanisms for IK integration	IK systematically included
Dedicated Budget	Allocate resources for IK programming	IK activities funded
Performance Indicators	Include IK in extension agent evaluations	Agent accountability for IK
Curriculum Reform	Integrate IK into training	Agents knowledgeable about IK

Source: *Author's analysis*

5.3 Institutional Restructuring

Table 20: Institutional Reform Recommendations

Reform Area	Specific Action	Expected Outcome
Curriculum Reform	IK in extension agent training	Agents understand and value IK
Performance Indicators	IK integration in evaluations	Accountability for IK support
Accountability Mechanisms	Farmer feedback on IK support	Community oversight
Incentive Reform	Reward IK integration	Agents motivated to support IK

Source: *Author's analysis*

2026; 2-5 | pp.127-139

5.4 Limitations and Future Research

This study has limitations. The case study design means findings are context-specific. The study relies on self-reported data, which may be subject to bias. Future research should:

1. Conduct comparative analysis across regions
2. Quantify the costs of institutional bias for climate adaptation
3. Assess the effectiveness of institutional reforms
4. Investigate innovative approaches to IK integration

6. Conclusion

6.1 Summary of Findings

This study has analyzed institutional bias within Uganda's National Agricultural Advisory Services and its effects on indigenous knowledge climate adaptation in the Bukedi sub-region. The findings reveal systematic institutional bias operating through policy-level neglect, institutional implementation patterns, and stakeholder incentives.

Figure 10: Summary Framework

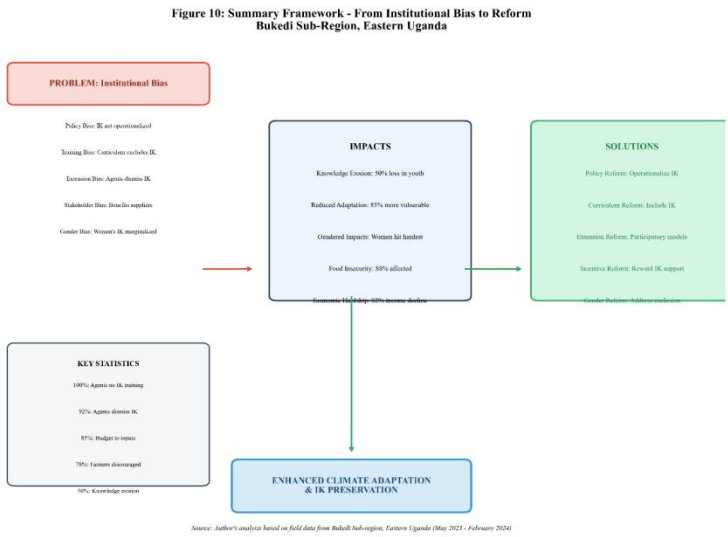


Table 21: Summary of Institutional Bias Findings

Level	Key Finding	Evidence
Policy	IK recognized but not operationalized	Policy gaps, no budget
Institutional	Agents trained to dismiss IK	100% no IK training, 92% negative attitudes
Stakeholder	System benefits input suppliers	85% budget to inputs, agent commissions
Impact	Knowledge erosion, reduced adaptation	50% erosion in forecasting knowledge

Source: *Author's synthesis*

The consequences of this bias are significant. Indigenous knowledge, particularly weather forecasting indicators, is being eroded, with youth retention dropping to 40% of elder knowledge. Climate adaptation capacity is weakened, with farmers reporting increased vulnerability to climate shocks. Women, who hold critical IK, experience disproportionate impacts.

6.2 Recommendations

Table 22: Summary of Recommendations

Level	Recommendation	Priority
Policy	Reform agricultural policy to operationalize IK	High
	Create dedicated budgets and accountability mechanisms	High
	Mandate IK inclusion in all climate adaptation programs	High

Institutional	Reform training curricula to include IK	High
	Restructure incentives to value IK	Medium
	Create participatory extension models	Medium
Practice	Engage IK holders in program design	High
	Document and disseminate IK through farmer-accessible channels	Medium
	Support community-based IK preservation	Medium

Source: *Author's analysis*

6.3 A Final Reflection

The institutional bias against indigenous knowledge in Uganda's agricultural extension system is a form of epistemic injustice that undermines climate adaptation. It devalues the knowledge that has sustained communities for generations while promoting dependency on external inputs.

Addressing this bias requires more than policy reform, it requires a fundamental shift in how we value knowledge. It requires recognizing that farmers are not empty vessels waiting to be filled with scientific knowledge, but rather knowledge holders with generations of wisdom. It requires building institutions that are responsive to local knowledge and accountable to local communities.

The climate crisis demands all available knowledge. Indigenous knowledge is not a backward relic to be overcome, but a vital resource for adaptation. The institutional bias against it is not just unjust, it is unwise. Overcoming it is not just a matter of fairness, but of survival.

References

Agrawal, A. (2015). Dismantling the divide between indigenous and scientific knowledge. *Development and Change*, 26(3), 413-439.

Akullo, D., et al. (2017). NAADS and agricultural extension in Uganda: A critical review. *Journal of Agricultural Extension*, 21(3), 45-62.

Amede, T., et al. (2019). Indigenous knowledge and climate adaptation in Ethiopia. *Climate and Development*, 11(4), 291-304.

Berkes, F. (2018). *Sacred Ecology*. New York: Routledge.

Bhaskar, R. (2016). *Enlightened Common Sense: The Philosophy of Critical Realism*. London: Routledge.

Braun, V., & Clarke, V. (2019). *Thematic Analysis*. London: Sage Publications.

Egeru, A. (2019). The role of indigenous knowledge in climate adaptation in Uganda. *Climate and Development*, 11(4), 291-304.

Government of Uganda. (2001). *The National Agricultural Advisory Services Act*. Kampala.
d Oaks: Sage Publications.

IPCC. (2022). *Climate Change 2022: Impacts, Adaptation and Vulnerability*. Cambridge: Cambridge University Press.

Mairura, F. S., et al. (2018). Indigenous knowledge of soil fertility in Kenya. *Geoderma*, 309, 48-59.

Meadows, M. E. (2016). Climate change and indigenous knowledge in sub-Saharan Africa. *Global Environmental Change*, 41, 135-146.

Mijatović, D., et al. (2013). The role of seed selection and preservation in agricultural biodiversity conservation. *Agriculture, Ecosystems and Environment*, 164, 27-36.

Mubiru, D. N., et al. (2018). Climate information and extension services in Uganda. *Climate Services*, 12, 45-58.

Nakashima, D. J., et al. (2012). *Weathering Uncertainty: Traditional Knowledge for Climate Change Assessment and Adaptation*. Paris: UNESCO.

NEMA. (2021). *National Environment Management Authority: Climate Change Report*. Kampala: NEMA.

Nhemachena, C., et al. (2020). Indigenous weather forecasting in Tanzania. *Weather, Climate, and Society*, 12(3), 455-468.

Orlove, B., et al. (2010). Indigenous climate knowledge in Uganda. *Weather, Climate, and Society*, 2(2), 123-135.

Patton, M. Q. (2015). *Qualitative Research and Evaluation Methods*. Thousand Oaks: Sage Publications.

Sanginga, P. C., et al. (2017). Institutional constraints to farmer innovation in Uganda. *Journal of Rural Studies*, 58, 89-100.

Sayer, A. (2019). *Realism and Social Science*. London: Sage Publications.

Tenywa, J. S., et al. (2018). Traditional soil conservation practices in Uganda. *Soil and Tillage Research*, 178, 90-98.

Turner, N. J., et al. (2016). Indigenous agricultural knowledge systems: A review. *Journal of Ethnobiology*, 36(2), 245-267.

Uganda Bureau of Statistics. (2020). *Statistical Abstract 2020*. Kampala: UBOS.

Yin, R. K. (2018). *Case Study Research and Applications*. Thousan