

ASSESSING THE DETERMINANTS OF SMALLHOLDER FARMERS' TRANSITION TO CLIMATE CHANGE ADAPTATION IN INSIZA DISTRICT, ZIMBABWE

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Abstract

Situated within the Community-Based Adaptation approach, this study examines the determinants of smallholder farmers' transition to climate adaptation in Insiza District, Zimbabwe. The research employed qualitative methods for data collection, gathering information through documentary analysis, fifteen key informant interviews, and three focus group discussions. The findings reveal that while farmers rely on indigenous knowledge and local initiatives, such as farmers' associations and small livestock schemes, these efforts are constrained by systemic challenges. Significant barriers include the politicisation and inadequate targeting of government programs such as Intwasa, as well as unresolved agrarian issues that weaken institutional support. The study underscores a disconnect between top-down policies and local realities, where high labour costs and inflexible input systems impede the adoption of resilient practices. Ultimately, it canvases for the recognition of local institutions and the integration of traditional ecological knowledge with modern climate services to promote long-term, self-sustained adaptation in vulnerable rural communities.

Keywords: Agro-ecological, Community-Based Adaptation, Determinants, Insiza, Smallholders, Transition, Zimbabwe

1. Introduction

The emerging anecdotal evidence reveals that climate change has adversely affected the agricultural sector in the rural Global South, particularly in the semi-arid and arid agro-ecological zones, which are characterised by low rainfall, high temperatures, poor soils, and a lack of perennial rivers (Ahmed & Fatema, 2023; Mellor, 2017), with far-reaching consequences for smallholder farmers' livelihoods assets, economic growth, agricultural growth, and rural development. Studies in Ethiopia, Bangladesh, Nepal, Zimbabwe, and other least-developed countries in the Global South reveal that economies are vulnerable to climate change due to smallholder farmers' reliance on rain-fed agriculture (Ahmed & Fatema, 2023; Hirpha et al., 2020; Paudel et al., 2019). These effects include floods and recurrent hydrological and meteorological droughts, such as the recent El Niño-induced drought, which had

devastating consequences for the livelihoods of smallholder farmers in Zimbabwe and Southern Africa, resulting in a trail of destruction, including widespread animal and crop mortalities.

Elsewhere, Hirpha et al. (2020) found that most smallholder farmers in Ethiopia use at least one climate change adaptation strategy in their local areas, though these strategies are generally weak, and access to agricultural extension services and training on climate change significantly influences adaptation practices. In this context, a weak institutional framework and a lack of support constrain smallholder farmers' transition to climate adaptation. These findings were similar to Ahmed and Fatema (2023) study in Bangladesh, which found that gender, age, education of household heads, household assets, annual farm income, farm size, tenure status, farmer-to-farmer extension, access to credit, access to subsidy, and access to electricity all affect farmers' selection of adaptation strategies for climate change. Similarly, Paudel et al.'s (2019) study in the Nepal Himalayas reveals that farmers' socio-economic and agricultural characteristics directly influence their perceptions of climate change. Notwithstanding the global literature's focus on the social and economic determinants of climate adaptation, there remains an urgent need to investigate how unresolved agrarian question(s) and institutional disconnects shape smallholder farmers' transition to climate adaptation in Zimbabwe. In Zimbabwe, Climate change specifically exacerbates the difficulties arising from the disruptive implementation of the agrarian transition (Shonhe, 2019; Moyo et al., 2013). This disruption has weakened key institutions, including the Department of Agricultural, Technical, and Extension Services and financial institutions. These crucial entities, which should act as buffer zones for resilience, are either too expensive or unwilling to finance smallholder farmers, thereby exposing them to climate shocks. Byres (1991: 9) defined the unresolved agrarian question as "...a central characteristic of economic backwardness. In its broadest meaning, the agrarian question may be defined as the continuing existence in the countryside of a poor country of substantive obstacles to the unleashing of the forces capable of generating economic development, both inside and outside agriculture. Originally formulated with respect to incomplete capitalist transition and certain political consequences of that incompleteness, the agrarian question is now also part of the debate on possible socialist transition in poor countries." From this perspective, resolving land and agrarian questions may be a determinant of smallholder farmers' ability to escape poverty and transition to climate adaptation (Byres, 1991). This context underscores the need to assess the specific constraints and supports facing smallholders in climate-vulnerable settings. Within this premise, this study aims to investigate the key factors that constrain and facilitate smallholder farmers' transition to climate-adaptive practices in the rural Insiza District of Zimbabwe. The following section discusses the Community-Based Adaptation Approach (CBAA), a theoretical framework guiding this study.

2. Literature Review and Theoretical Framework

The transition of smallholder farmers to climate change adaptation in Insiza District is analysed using the CBAA theoretical framework. Climate adaptation involves adjustments made by people to lessen the adverse effects of climate change while maximising opportunities, ultimately reducing vulnerability and increasing the capacity to cope with climate impacts (Clarke et al., 2019). Prominently advocated by institutions such as the International Institute for Environment and Development, CARE, and the United Nations Development Programme, the CBAA is a bottom-up, strengths-based approach aimed at enhancing the adaptive capacity of vulnerable communities (Kirkby et al., 2018). Its core principle is to place the community at the centre of determining responses to climate change impacts.

The CBAA represents a deliberate shift away from hegemonic, centralised, top-down adaptation discourses. It is defined as a community-led process rooted in the community's own priorities, needs, knowledge, and capacities, aimed at empowering local people to plan for, adapt to, and cope with the impacts of climate change (Clarke et al., 2019).

Proponents describe it as empowering, participatory, and supportive of local solutions by integrating local and traditional knowledge with scientific data, thereby ensuring interventions are context-specific and culturally relevant. This cost-effective, integrated response aligns with broader national and global development goals, promoting sustainable livelihoods, eradicating poverty, and enhancing food security. On this premise, this study adopted CBAA to examine the key factors that constrain and support smallholder farmers' transition to climate adaptation in Zimbabwe's Insiza District. Despite its significant strengths, the CBAA faces conceptual and practical challenges. While the notion of participatory engagement is popular (Chambers, 1986), its implementation often struggles with intra-community power dynamics and elite capture, which can sideline the needs of the most marginalised groups, such as women or the poorest households (Kirkby et al., 2018).

Furthermore, integrating local and external scientific knowledge systems is difficult in practice. After all, they are embedded in different, often contrasting, ontologies and epistemologies, which can lead to mistrust on both sides (McNamara et al., 2020).

For this study, the CBAA serves as the analytical tool for assessing smallholders' transition to climate resilience in Insiza. Its focus on locally led processes aligns directly with the study's objective. CBAA's operational focus on key community assets—specifically knowledge and information, decision-making and governance, participation and power dynamics, improved technologies/innovation, and institutions (McNamara et al., 2020)—provides the necessary structure for analysing the qualitative data gathered. By employing this bottom-up approach, the study ensures that recommendations for optimal strategies are informed by the local priorities and existing capacities of the smallholder farmers, making the proposed solutions relevant and sustainable for enhancing resilience.

The justification for adopting this theory lies in its broader scope of adaptive action and its greater emphasis on society. In particular, CBAA places greater emphasis on the systemic drivers of inequality that restrict communities' access to resources, power, and decision-making, thereby contributing to the failure to transition to climate adaptation. Thus, the CBAA framework recognises that internal power dynamics and the problematic integration of traditional ontologies with modern scientific data often mediate the success of local adaptation.

3. Materials and Methods

3.1. Study design and context

Insiza District is in the eastern part of Matabeleland South Province, Zimbabwe (figure 1). It is characterised by gentle, undulating terrain with scattered granite outcrops. The district is situated within the Agro-ecological Regions IV and V, which receive no more than 650mm of annual rainfall, are characterised by high temperatures that lead to high evaporation rates, and experience frequent seasonal droughts.

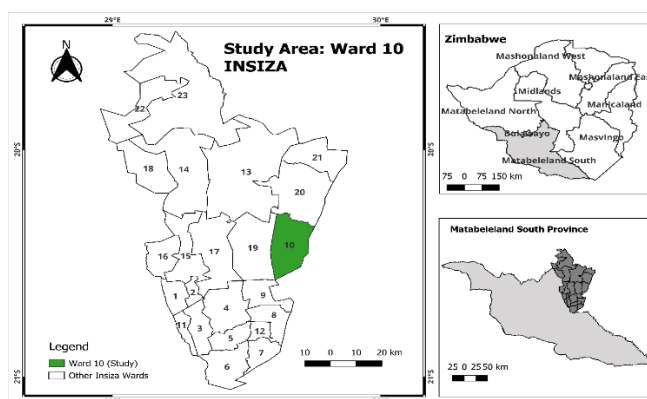


Figure 2. Insiza District Map

Compiled by the author (Field Research)

The district is endowed with significant mineral reserves, including gold, asbestos, nickel, lithium, and limestone. It is traversed by major rivers, including the Umzingwane, Insiza, and Shangani, which are often silted by widespread gold panning. Ward 10 also has major rivers such as Malole and Mwele, which are sources of alluvial mining. Livelihoods in the district are centred on a combination of animal husbandry and rain-fed crop cultivation. Due to recurring climatic shocks, farmers often supplement their income through non-farm activities, including small-scale mining, local or cross-border migration, remittances, and beer brewing.

3.2. Data, variables, and sampling

The study draws on literature on climate change and livelihoods identified via Google Scholar, Google, Web of Science, and Scopus. To obtain papers on the determinants of smallholder farmers' transition to climate adaptation; the following terms were entered in search engines: "Determinants of Smallholder Farmers' Transition to Climate Adaptation", "Smallholder Farmers' livelihoods", and "Climate Adaptation." To obtain works from the Global South, the strings of words were entered in combination with such terms as "global south", "Africa", "Asia", and "least developed countries." Three FGDs were conducted, comprising 12 smallholder farmers purposively selected to ensure a mix of experiences, including youth, older, long-term smallholder farmers, and both male and female farmers, to capture varied perspectives on climate change impacts and adaptation strategies within each group. The diversity of the FGD was important, as agricultural adaptation in this region is deeply influenced by demographic differences. Older farmers often attribute climate extremes to a natural phenomenon, "angry gods," rely on indigenous knowledge, and are unwilling to adopt new techniques such as de-stocking.

In contrast, the younger generation leverages technological expertise for scientific advisories, crop selection, and modern treatments, and is more willing to invest in resilient infrastructure such as solarised boreholes. Retired civil servants possess extensive knowledge, are effectively applying it to their farming, and are prioritising investment in drilling boreholes and small-animal rearing, such as poultry and goats. Gender norms are also shifting due to male migration, resulting in women constituting most of the active farm labour force. Despite their increased workload and new roles, migrant males often retain control over crucial farm decisions and the registration of government input.

Key informant interviews (KII) (15) were conducted with officials from Insiza Rural District Council (IRDC), Government officials from the Ministry of Agriculture and Rural Development, Ministry of Climate Change, Ministry of Local Government; Agricultural Rural Advisory Services, Veterinary Services; Traditional Leaders, Political leaders including the Councillors and the Members of Parliament; Farmers Unions and also University students studying Climate Change at the local Gwanda State University; Climate Change Experts as well as officials from the Non-Governmental Organisations operating within the District.

A qualitative approach was adopted to comprehensively understand the factors that constrain and support smallholder farmers' transition to climate adaptation in the Insiza District. This approach was deemed suitable because it accounts for the intricate nature of climate adaptation, encompassing processes and systems within climate governance.

3.3. Analytical methods

A qualitative approach was adopted to comprehensively understand the factors that constrain and support smallholder farmers' transition to climate adaptation in the Insiza District. This approach was deemed suitable because it accounts for the intricate nature of climate adaptation, encompassing processes and systems within climate governance. Data were thematically analysed. Themes were derived from the objective(s) of the study.

4. Results

4.1 Constraints to smallholder transition to climate adaptation in Insiza District

This section presents the extent of climate change vulnerability and the activities of smallholders in selected Ward 10 of Insiza District over the past 5–10 years. Specifically, the section examined how climate change has affected smallholder farmers' agricultural activities, including planting times, crop yields, livestock health, and rangeland health. A response from a consulted farmer succinctly captured the changes that have taken place:

"I started farming here in the Malole area in 1986. I was attracted to this place because of its reputation for supporting crop and animal production. However, things have changed. At that time, we received adequate rainfall that kept our plants alive without dry spells, and our pastures were well-watered. While the rains ended in April, we also used to receive some rain between August and September, which was not necessarily for crop farming. However, we used to take advantage of these rains to prepare our fields for the farming season that starts around October. However, this is no longer happening; it is dry. Animals and crops are no longer surviving. Sometimes we receive rain in December, and it continues into February (FGD 1, Ward 10)".

The study noted erratic rainfall during the rainy season, which was shorter. This was corroborated by a consulted informant who stated that:

"The rains have become erratic, resulting in replanting costs for the already poor smallholders. Even for animals, the cumulative effects of erratic rainfall have led to depleted rangelands in this area" (KII 3, IRDC). It is important to note that Ward 10 and the other wards in Insiza District fall within agro-ecological regions IV and V, which are drier, receive erratic rainfall that rarely exceeds 650mm per annum, have temperatures exceeding 39 °C, and lack perennial rivers. There are also a few water-

harvesting infrastructure facilities, such as dams and weirs (KII and FGDs, Malole Area, Ward 10). The absence of these makes smallholders vulnerable to the impacts of climate change. The study found that the mid-year rain noted above was also reported by study participants (FGD 1 & 2, Malole Area, Ward 10) as 'imbolisamahlanga' (the rain that causes maize stock to rot) and was reported as having ceased to fall. This rain meant that rivers would flow, and ponds, together with dams, would be refilled. Thus, under these conditions, water was available for both crops and animals. The cessation of the 'imbolisamahlanga' rains, which are associated with climate change, has also made water availability a significant challenge for smallholders in the study area. Findings from the study indicate that this has led to prolonged droughts and heatwaves, which affect animal health and crop production (FGD 1, 2 & 3, Ward 10). A consulted informant for the study stated that:

"Insiza District, like other regions IV, was known for quality animal production. However, the district is currently facing animal diseases that it has not previously experienced. The tick-borne disease known as the January disease entered the district, exacerbating an already dire situation, as the district was struggling to recover from the drought (KII, Climate Change Expert, Insiza)."

Thus, climate change in Insiza District has brought climate-related challenges like droughts, heatwaves, and new pests and animal diseases that have decimated livestock production and left smallholder farmers with nothing. Climate change has also led to the scarcity of natural resources, which are critical for climate adaptation. While the unavailability of these resources should have prompted changes in farming practices that are more adaptive to changing conditions, the studied farmers (FGD 1 & 2, Ward 10) stated that they are still using the technologies they used five decades ago, planting the same crops and keeping the same animals. This (in)decision is primarily influenced by several factors, including a lack of a clear needs-oriented rural development and agriculture policy. A consulted smallholder farmer stated that:

"Since 1966, when I came here, I have not changed farming practices. I am still doing what I was doing. I am planting 4 hectares of maize and 1 hectare each of groundnuts, sorghum, and other crops, because, in total, I plant no more than 10 hectares. I have not changed because I am still using the same ox and plough; I still receive a bag or 2 of fertiliser from the government; and labour costs are high. All our children are still busy with their studies, and you find that these hired labourers are very unreliable (FGD, Ward 10)."

It was an implicit finding that older, long-term male farmers often reflected on changes in the weather. At the same time, discussions of the need for hired labour and traditional grains often included the input and perspectives of female farmers in the focus groups, particularly regarding household food security and the increased burden of water collection (KII, IRDC). Thus, the transition to climate change adaptation will require the modernisation of agricultural systems, including the development of vital hydrological infrastructure and investment in climate research and development. Such a climate adaptation strategy would involve pursuing modernisation processes, with particular emphasis on research and on linking farmers to the non-farm sector. The linkages between the farm and non-farm sectors, notwithstanding their importance, remain underappreciated and poorly understood (Mellor, 2017). While acknowledging that research and development have been underfunded, in the context of increasing climate vulnerability, research efforts must be greater than they otherwise would be to address higher temperatures, potentially more variable rainfall, and other possible effects of climate change. That should involve developing crop varieties for prevailing conditions and testing alternative

crops, all subject to profitability calculations under unbiased price regimes (Gumede & Shonhe, 2021). While indigenous breeds such as Tuli and Afrikaner, and crop varieties, have been developed and maintained, they remain relatively expensive and inaccessible to poor smallholders. This explains why farmers continue to use the breeds they have used for five decades. The study found that community-based groups in Insiza are currently engaged in climate change adaptation initiatives. A consulted informant stated:

"Alongside non-governmental organisations and initiatives led by the Government of Zimbabwe, we have our own farmers' association. " The Farmers' Association is a nonprofit group formed by small-scale farmers. The association's committee serves as a de facto committee for drought relief and other farmer-related activities in the area (KII, IRDC)."

4.2 Facilitators for smallholder transition to climate adaptation in Insiza District

This section examines the conditions that support smallholder farmers' transition to climate resilience in Insiza District. The preceding section highlighted that the study area is characterised by a rudimentary agrarian economy devastated by climate change. This context is important for understanding the factors that support smallholders' transition to resilience. A consulted farmer stated:

I do use traditional agricultural practices. I have planted traditional maize and sorghum varieties that have yielded higher harvests in our area. We also have extension agents who are mentoring farmers to produce higher-yielding crops and livestock (FGD 3, Ward 10). "Thus, the availability of agricultural extension services is key, particularly for accessing critical climate information and new farming techniques. However, these practices have not been integrated with modern approaches to building resilience, such as weather forecasting, to inform farmers on what, when, and how to plant in a particular season (FGDs 1, 2, and 3; Ward 10; KIIs, Insiza). Tables 1 and 2 below present nuanced traditional and indigenous knowledge practices used by farmers, passed from one generation to the next.

Table 1. Indigenous Knowledge Systems for Rainfall Prediction

Indicator	LONG-TERM: Rainfall (✓) / No Rainfall (✗)	SHORT-TERM: Rainfall (✓) / No Rainfall (✗)	Period	Explanation
Fruits/Plants				
Early flowering of trees (e.g. acacia, marula)	✓ Rainfall	✗ No	August & September	Early flowering suggests a good rainy season is coming, given favourable conditions.
Early sprouting of grass or new shoots	✓ Rainfall	✓ Rainfall	September & October	Shows sufficient soil moisture and signals the onset of rains.
Trees are shedding leaves unusually early	✗ No Rainfall	✗ No Rainfall	July and early August	A drought sign showing that plants are conserving water.
Birds				
Seeing or hearing a bird called Udwayi	✓ Rainfall	✓ Rainfall	August or September	The bird's call and appearance coincide with increased humidity and insect activity, signalling the onset of rainfall.

Birds leaving early or absent during expected season	✗ No Rainfall	✗ No Rainfall	August	Absence of usual bird species suggests delayed or below-normal rainfall.
Birds called Insingizi make distinctive sounds	✗ No	✓ Rainfall	October	Distinctive calls indicate rising humidity and approaching rainfall, a short-term sign for farmers
Weather conditions and patterns				
Appearance of umfansimbi (natural shiny phenomenon)	✓ Rainfall	✗ No	October	Umfansimbi signals that the coming rainy season would be good
Imbolisamahlanga (post-harvest rain near spring, causing rot to the main maize stock)	✓ Rainfall	✓ Rainfall	Late July – Early August	Replenishes soil and prepares land for the next season;
Wind blowing from north to south	✗ No	✓ Rainfall	Late September – Early October	Winds shift direction when moisture-bearing systems approach.
Heavy dust storms before seasonal rains	✗ No	✓ Rainfall (soon after)	Early September & October	Dust storms can precede rainfall due to pressure changes.
Animals				
Ants building tall mounds or sealing holes	✗ No	✓ Rainfall	October	Ants seal nests to prevent flooding, showing imminent rainfall.
Silence of frogs in the rainy season	✗ No Rainfall	✗ No Rainfall	Late October – March	Suggests unfavourable humidity
Butterflies moving together in large numbers.	✓ Rainfall	✓ Rainfall	September and October	Increased butterfly activity indicates improved humidity and vegetation, suggesting imminent rainfall.

Source: Compiled by the author (Field Research)

These are used to predict weather on a long-term (at least 6 months) and short-term (weeks-days) basis and guide farmers when, how, what, and what not to plant. While its major weakness may be its inability to project rainfall beyond one calendar year (see Table 2), its utility lies in its connection to farmers and in its potential to mitigate climate-change-related planting and pre- and post-harvesting costs.

These represent an opportunity for nature-based solutions. Although IKS has been on the periphery of modern scientific knowledge, this may not be ideal. Modern technology is erratic and not context-specific because it provides district-based forecasts. The key is to get the best from both.

These practices are critical to building a climate-resilient future, especially when coupled with community-based initiatives to combat climate change. A consulted smallholder farmer stated:

“Although Intwasa is a government smallholder farmer initiative, it is practised by only a few farmers. It requires substantial labour, and many have opted out. Additionally, other initiatives, such as the government's provision of millet, sorghum, and other traditional grains, are not only labour-intensive but also require block farming. In this area, people eat white maize and have always planted only a few

grains, primarily for traditional ceremonies and to feed their chickens. If there is no block farming, birds will finish your harvest before it even ripens (FGD 2, Ward 10)."

Table 2. The Indigenous Knowledge Systems calendar and characteristics

Season	Months (Time Frame)	Characteristics	Farming / Agricultural Activities
Ihlobo (Summer)	Mid-October – Mid-March	Hot, wet season with heavy rains and thunderstorms; long days, short nights. Rivers and dams fill up; vegetation is green and dense; grasses grow fast. Livestock are healthy with plenty of grazing; insects (mosquitoes, ants) increase	Planting and weeding. Early harvesting begins Food drying
Ikwindla (Autumn)	Mid-March – Mid-May	Hot days and cool evenings; rainfall is frequently reduced; mornings may be misty. Crops mature and dry; other breeds of grass start losing freshness. Wildlife moves closer to water sources. Harvest celebrations (Isivuno); grain storage and food processing increase.	Peak harvesting season for grains and legumes. Drying and storing produce. Land Preparation
Ubusika (Winter)	Mid-May – Mid-August	Cool, dry season; short days, long nights; very little to no rainfall; cold mornings and nights. Some days are frigid and rainy Trees shed their leaves; grass dries up; dusty conditions are common. Livestock struggle with limited grazing and water; animals rely on stored feed; wildlife is less active.	Post-harvesting. Receipt rains called Imbolisamahlanga
Intwasa (Spring)	Mid-August – Mid- October	Hot and dry weather conditions; occasional whirlwinds; Trees start forming new leaves; vegetation begins to grow; Dust is common early in the season. Livestock are weak in winter. Animals become restless due to heat; Birds become more active.	Clearing land and preparing for farming. Ploughing, applying manure and fertilizer. Early planting of vegetables. Pastures slowly recover before summer rains.

Source: Compiled by the author (Field Research)

The above response highlights key issues, such as the availability of government inputs. Intwasa farming technique is a government-driven strategy aimed at enhancing smallholder farmers' adaptation to climate change by promoting the adoption of soil-conservation technologies and the commercialisation of smallholder farming. The study findings revealed that the contractual arrangements between smallholders and the Government of Zimbabwe, through the Grain Marketing Board—where the latter provides farming inputs free of charge and the former sells the produce at competitive prices—reflect the government's attempt to commercialise smallholders (KII, IRDC). The study found that the Intwasa government programme is part of the broader menu of government programmes to build rural climate adaptation, alongside programmes such as rural goat schemes, improved cattle breeds, and chicken schemes (FGD 1, 2 & 3). It is also seen as a rural development strategy. The study's findings revealed

that, while the programmes are well-meaning, they fall short, particularly in transparency, accountability, and targeting, as inputs have, in many cases, been politicised.

The programme overlooks context-specific challenges, such as labour constraints and farmers' choices regarding which crops to plant. It is a state-centric model that imposes on smallholders what they should do. Until recently, inputs were standardized nationwide, ignoring the distinct agro-ecological regions and the required crops. While the recent policy shift has mandated that all agro-ecological regions V and VI receive traditional grains, which are viewed as climate-resilient, this policy overlooks that farmers' crop choices are primarily influenced by the staple, not by climate conditions. In Ward 10 and the Insiza district, maize is the staple crop. The choice of maize is driven mainly by the additional labour required to cultivate traditional grains, which are primarily planted to feed poultry, to produce traditional beer and for other ceremonies. Traditional grains are not favoured because harvesting is labour-intensive and requires block farming, without which these farmers have reported losses to birds. According to Robert Chambers' analysis, the Intwasa farming model is an elitist policy that overlooks efforts to improve local indigenous crops and livestock breeds.

In addition, drawing on Amartya Sen and Martha Nussbaum's capabilities approach, and on the framing of government and existing indigenous knowledge systems in Ward 10, should construct the capacities necessary for smallholders to fully function in their chosen lives. The focus is not only on the distribution of inputs and the formulation of government policies, but also, more particularly, on how those deliberate interventions have contributed to the flourishing of smallholder farmers, thereby prompting the transition to climate adaptation. The limitations of Intwasa and the government's agriculture policies should be located in the context of Zimbabwe's unresolved land and agrarian questions, which continue to constrain smallholder farming, consigning them to the effects of climate change and constraining their transition to climate adaptation and ultimately their productivity, rendering them food insecure and subjecting them to high levels of rural poverty. This continues to undermine smallholders' livelihoods.

The study's findings reveal that the state is complicit in land-use practices, particularly through insecure land tenure. The subalterns' concern is that the persistent, disarticulated nature of Zimbabwe's domestic smallholding exposes them to the effects of climate change. There is, therefore, a need for deliberate policies, as exemplified by Thomas Sankara's government, which oriented land policy toward providing access to land and assistance to rural peasant farmers, and toward building agro-businesses in which the produce of smallholders could be processed within Burkina Faso. While the government of Zimbabwe attempted to implement this policy through the 2000 land reform, its failure to provide financial assistance to farmers undermined the policy's implementation. Thus, the policy outcomes did not reflect the government's recognition of the centrality of smallholder farmers in alleviating poverty and inequality (Amin, 2014).

Thus, this was a missed opportunity to build a base for smallholders to transition to. This argument is also premised on the idea that there is a relationship between agriculture, rural development, economic growth, and climate adaptation. Thomas Sankara's agricultural policy underscores the importance of investment in agricultural development, both financial and institutional. This wisdom is also reflected in NEPAD's Comprehensive Africa Agriculture Development Programme. Greater investment in agriculture leads to sectoral development, including increased productivity, agricultural growth, and expansion of the non-farm economy. Put differently, an investment in the agricultural

sector, which is currently absent in Zimbabwe, supports smallholders' transition to climate-resilient agriculture. The agricultural sector is affected by exogenous and indigenous factors. The former includes unfair trade, the lingering effects of structural adjustment policies, and the scarcity of external resources. The latter factors include insufficient allocation of domestic funding, weak institutions and policies, excessive centralisation of power, inadequate infrastructure, insufficient attention to mechanisation, and insecure land tenure and landlessness.

5. Discussion

The study findings confirm that the transition of smallholder farmers in Insiza District is not a technical obstacle but is convoluted by the unresolved land and agrarian question, which Sam Moyo, Samir Amin, and Terry Byres identified as a core characteristic of economic backwardness that undermines rural developmental prospects. The study aligns with broader scholarly findings on the significance of government policies in climate change adaptation amongst smallholders (Ahmed & Fatema, 2023; Paudel et al., 2019). Research worldwide confirms that government-deliberate policies, including ensuring the availability and access to finance, are central to smallholders' transition to adaptation (Hirpha et al., 2020). For instance, the literature shows that deliberate state policies have built a robust smallholder economy in South Korea, Taiwan, Singapore, and other East Asian Economies, enabling smallholders to escape poverty and adapt to climate change (Mills et al., 2021). Consistent with Moyo et al. (2013), Amini (2014), Mellor (2017), and Gumede & Shonhe (2021), these findings underscore that national agricultural policy objectives should align with specific community needs. Practical approaches often combine participatory methods with adequate funding and flexible bureaucracy, yet there is a need for context-specific, tailored interventions to unlock the full potential of smallholders (Mellor, 2017). While the CBAA advocates a bottom-up, strengths-based climate adaptation transition, punctuated by local priorities and indigenous knowledge, this process is currently constrained by a state-centric, elitist policy and institutional framework, as shown in Table 3.

Table 3. Applicability of Community-based Adaptation

CBAA Core Principle	Applicability	Findings
Placing Community at the Centre	Use of local Indigenous Knowledge Systems (IKS) for weather forecasting.	Smallholder farmers use nature-based indicators (birds, trees, insects) to predict weather patterns and determine planting times and crop selection.
Bottom-Up Process	Formation of non-profit Farmers' Associations.	These associations act as de facto committees for drought relief and coordination of all issues about farming.
Strengths-Based Approach	Maximising existing community assets, such as small livestock schemes (e.g., goats and poultry).	Farmers sell small livestock to fund education and purchase food or agricultural inputs during droughts.
Integration of Knowledge	Combining traditional practices with modern extension services.	Agricultural extension officers guide smallholder farmers in adopting new techniques while respecting the use of traditional varieties.
Addressing Systemic Drivers	Identifying constraints such as insecure land tenure and the politicisation of input distribution.	The study highlights that resolving the agrarian question is essential for long-term climate adaptation.

Source: Research findings

At a global level, international organisations such as the IPCC, the International Work Group for Indigenous Affairs, UNFCCC, and the Green Climate Fund have recognised the centrality of local communities' realities in climate adaptation. A Robert Chambers' analysis suggests that Zimbabwe's agricultural policy frequently overlooks the improvement of local indigenous crops and breeds, resulting in a disconnect in which state-led modernisation fails to integrate with the community's lived realities and traditional knowledge systems. The study highlights that these contextual factors have worked in concert to constrain smallholder farmers' transition to climate adaptation. The observed failure to implement the block farming technique due to labour constraints validates Robert Chambers' critique that centralised policies often disregard the realities inherent in smallholder production systems. To transition to climate adaptation, the focus must shift from the mere distribution of inputs to the active construction of capabilities, as framed by Amartya Sen and Martha Nussbaum. This requires strengthening local institutions, and linking them to local state institutions, such as extension services (Ahmed & Fatema, 2023; Hirpha et al., 2020; Paudel et al., 2019) to ensure that smallholders have the urgency, agency, and structural support necessary to function in their chosen lives fully (Mellor, 2017). Currently, the disarticulated nature of Zimbabwe's smallholding, characterised by insecure land tenure, labour scarcity, and limited investment, consigns farmers to perpetual vulnerability rather than long-term adaptation. Addressing these agronomic production challenges and integrating scientific climate services with indigenous wisdom are essential to empower subaltern farmers in Insiza to transition toward a self-directed, climate-resilient future.

6. Conclusions

This study examined the determinants of smallholder farmers' transition to climate adaptation in Insiza District, Zimbabwe. Findings suggest that climate adaptation for smallholder farmers in Insiza District requires a fundamental shift from state-centric models to a more integrated, community-led approach. Drawing on the CBAA and the study's theoretical framework, the study highlights that existing government interventions, such as the Intwasa program, are frequently undermined by systemic issues, including politicisation, poor targeting, and a failure to align with local staple-crop preferences and labour realities. The findings reveal that while farmers rely on indigenous knowledge and local initiatives, such as farmers' associations and small livestock schemes, these efforts are constrained by systemic challenges. Significant barriers include the politicisation and inadequate targeting of government programs such as Intwasa, as well as unresolved agrarian issues that weaken institutional support. The study underscores a disconnect between top-down policies and local realities, where high labour costs and inflexible input systems impede the adoption of resilient practices.

6.1. Practical and policy implications

To effectively support the transition to climate change adaptation among smallholders in Insiza, a holistic strategy must address land and agrarian questions in Zimbabwe and strengthen extension services, which have thus far acted as a primary barrier, confining smallholders to short-term coping mechanisms rather than long-term resilience. By doing so, this study makes a significant contribution to the emerging literature that highlights the often taken-for-granted importance of IKS in adaptation-building, climate action, and climate change mitigation within communities. Ultimately, this study supports the literature's claim that economies reliant on ecosystem-based livelihoods are highly vulnerable to the effects of climate change. The study further argues that this vulnerability in Zimbabwe

is a policy choice, driven by a disconnect whereby top-down models ignore the proven utility of IKS and the capacities of subaltern farmers.

6.2. Limitations and future research

The methodology of this study adopted a qualitative approach to understand the factors that constrain and support smallholder farmers' transition to climate adaptation in the Insiza District. Focus group discussions and Key informant interviews were adopted as data collection methods. This methodological approach had its limitations. Particularly, one of the key findings was the centrality of indigenous knowledge as a facilitator for smallholder farmers' transition. That means the study relied on the lived realities of smallholder farmers and was also confirmed by key informants. But an emerging trend within the study is the testability of IKS. The ethnographic research would have given this research a stronger edge, particularly in testing the efficacy of indigenous knowledge systems and how they themselves are affected by climate change (Makondo & Thomas, 2018). Particularly birds, animals, and even trees, as they may be susceptible to climate change, and how this may lead to 'misinformation' and misdiagnosis of climate events. As such, future directions might expand the methodological approach and interrogate how Western science can be linked with the IKS for effective adaptation.

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References

- Ahmed, S., & Fatema, N. (2023). Factors and practices: Farmers' adaptation to climate change in Bangladesh. *Journal of Water and Climate Change*, 14(1), 123–141.
- Byres, T. (1991). Agrarian question. In T. Bottomore, L. Harris, V. G. Kiernan, & R. Miliband (Eds.), *A dictionary of Marxist thought* (2nd ed., pp. 9–11). Basil Blackwell.
- Clarke, T., McNamara, K. E., Clissold, R., & Nunn, P. D. (2019). Community-based adaptation to climate change: Lessons from Tanna Island, Vanuatu. *Island Studies Journal*, 14(1), 59-80.
- Hirons, M., Boyd, E., McDermott, C., Asare, R., Morel, A., Mason, J., & Norris, K. (2018). Understanding climate resilience in Ghanaian cocoa communities: Advancing a biocultural perspective. *Journal of Rural Studies*, 63, 120–129.
- Hirpha, H. H., Mpandeli, S., & Bantider, A. (2020). Determinants of adaptation strategies to climate change among smallholder farmers in Adama District, Ethiopia. *International Journal of Climate Change Strategies and Management*, 12(4), 463–476.
- Kahsay, G. A., & Hansen, L. G. (2016). The effect of climate change and adaptation policy on agricultural production in Eastern Africa. *Ecological Economics*, 121, 54–64.
- Kirkby, P., Williams, C., & Huq, S. (2018). Community-based adaptation (CBA): Adding conceptual clarity to the approach and establishing its principles and challenges. *Climate and Development*, 10(7), 577–589.
- Makondo, C. C., & Thomas, D. S. (2018). Climate change adaptation: Linking indigenous knowledge with western science for effective adaptation. *Environmental science & policy*, 88, 83-91.

- McNamara, K. E., Clissold, R., Westoby, R., Piggott-McKellar, A. E., Kumar, R., Clarke, T., & Nunn, P. D. (2020). An assessment of community-based adaptation initiatives in the Pacific Islands. *Nature Climate Change*, 10(7), 628–639.
- Mills, G., Obasanjo, O., Desalegn, H., & van der Merwe, E. (2021). *The Asian aspiration: Why and how Africa should emulate Asia—and what it should avoid*. C. Hurst & Co.
- Moyo, S., Jha, P., & Yeros, P. (2013). The classical agrarian question: Myth, reality and relevance today. *Agrarian South: Journal of Political Economy*, 2(1), 93–119.
- Moyo, S., Jha, P., & Yeros, P. (2013). The classical agrarian question: Myth, reality, and relevance today. *Agrarian South: Journal of Political Economy*, 2(1), 93–119.
- Paudel, B., Zhang, Y., Yan, J., Rai, R., Li, L., Wu, X., & Khanal, N. R. (2020). Farmers' understanding of climate change in the Nepal Himalayas: Important determinants and implications for developing adaptation strategies. *Climatic Change*, 158(3), 485–502.