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Research Report

Adapting to Climate Change: Experiences of Elderly Female Household Heads in Domboshava Communal Lands

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Abstract- The heavy reliance of elderly women on rain-fed agriculture in the context of a changing climate, combined with restrictive gendered power relations, places them in a precarious position. This ethnography, conducted in Gutsa village, Domboshava communal lands in Zimbabwe, asked: How do elderly female household heads make sense of, respond to, and organize their livelihoods in the wake of climate change? Findings show that adaptation capacity among these elderly women varies, largely based on access to vegetable gardens with reliable water, credit, and agricultural inputs. In addition, the impacts of climate change are exacerbated by other stressors such as poor market returns, the introduction of motorized water pumps, and the effects of the state-led Fast Track Land Reform Programme which was launched in 2000. These forces have compelled elderly women to shift from agro-based to non-farm-based livelihoods. These findings demonstrate the need for policies that support water access, informal markets, and the inclusion of elderly women's voices in climate governance.

Keywords: Adaptation, climate change, elderly women, ethnography, household, non-farm-based livelihoods.

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Introduction and background

Elderly women, especially those heading households in rural areas, play a crucial role in natural resource management and environmental health. However, they face disproportionate impacts from climate change. Their heavy reliance on rain-fed agriculture, combined with gendered inequalities in resource access and decision-making, creates a precarious situation. This study focuses on Gutsa village in the Domboshava communal lands of Goromonzi district, Zimbabwe. The area is in Agro-Ecological Region II, an area once suited for crop production but now increasingly affected by climate change. Here I explore how elderly female household heads perceive and respond to climate change and how they adapt their livelihoods under increasingly uncertain conditions.

By focusing on the lived experiences of elderly female household heads, an often-overlooked group in climate adaptation studies I bring forward voices and realities that are rarely documented in the literature or considered in policy frameworks in Africa. The study builds on the works of Eriksen *et al.* (2008) as cited in Nhamo (2014), who highlight the vulnerability of elderly women as guardians of resources in the face of climate change (also see Gandure 2011, 163). Africa's high vulnerability to climate change necessitates a strong focus on adaptation strategies (Hassan & Nhemachena 2008).

In Gutsa village, elderly women manage water and seed resources, tasks traditionally assigned through gendered divisions of labor. However, climate change particularly irregular rainfall compromises their ability to fulfil these roles, compounding pre-existing social and economic vulnerabilities. As Shambel (2012) found in Ethiopia, such climatic challenges deepen existing inequalities.

While previous studies have examined general household adaptation in rural Africa, few have paid close attention to the intersection of age, gender, and adaptation. This study responds to that gap, using rich ethnographic methods to illuminate the lived experiences of elderly women in adapting to climate impacts. Households are used as the unit of analysis, as decisions about consumption, production, and adaptation are often made at that level in agrarian societies (Ziervogel *et al.* 2006). Nevertheless, I also recognize, as Antwi-Agyei *et al.* (2012) suggest, that wider community dynamics shape these household decisions.

Material and Methods

Study Area

My nineteen-month intensive ethnography was conducted in Gutsa village, located in the Domboshava communal lands, Goromonzi district, Mashonaland East province in Zimbabwe, from April 2014 to November 2015. The village lies in Agro-Ecological Region II and is historically known for its suitability for farming.

Participants

Participants were selected using purposive sampling to ensure that only elderly female household heads with extensive local knowledge and long-term residence were included. The age threshold of 60 years and above was chosen because it is widely used in most developing countries to define elderly populations (Knodel *et al.* 2003). Selecting women with long-term residence and deep local knowledge allowed the study to capture the intricate ways these individuals have navigated household and agricultural responsibilities through decades of environmental and social transformation. To this end ten elderly women were purposively selected: Mbuya Tarai, Mbuya Ku, Mbuya Gone, Mbuya Mizhu, Mai Njere, Mai Chota, Mbuya Tawira, Mbuya No, Amai Cha, and Amai Reni. These women were long-term residents of the area, and their life histories provided rich insight into climate adaptation strategies.

Data Collection

An ethnographic approach was used which included participant observation and life history interviews. This method was vital for understanding how adaptation strategies are mediated by cultural values, livelihood risks, and long-standing community practices (Barnes *et al.* 2013; Worby 1992). Participant observation followed Cornwall and Jewkes' (1995, 1667) principle that researchers inherently engage in the activities of those they study. As Barayazarra and Puri (2011, 29) note, participant observation reveals moment-to-moment environmental engagement, offering deeper contextual insights.

Ethical Considerations

Informed verbal consent was obtained from all participants. To protect identities while preserving ethnographic authenticity, participants in this study are referred to by their

preferred honorifics or pseudonyms (e.g., “Mbuya” or “Mai”). Participants were informed about the purpose of the research and were given the option to withdraw at any stage.

Data Analysis

The collected life histories and fieldnotes were analysed using thematic analysis. I identified recurring patterns and grouped them into themes related to adaptation strategies, water access, seed knowledge, livelihood diversification, and climate perceptions. A narrative approach was employed to structure these themes into coherent accounts, demonstrating the lived realities and coping trajectories of each participant (du Preez 1991). This allowed for both individual variation and the surfacing of common community-level experiences.

Results and Discussion

Adapting Farming Practices in a Changing Climate

In response to the challenges posed by climate change, elderly women household heads in Gutsa village have implemented a range of adaptive strategies to enhance their agricultural practices. These adaptation strategies have been influenced by guidance from non-governmental organizations (NGOs) intermittently active in the Goromonzi district, as well as from the exchange of knowledge from more knowledgeable community members. A significant adaptation strategy has been the modification of tillage techniques. For example, Mai Reni noted that NGOs advised against preparing fields with ox-drawn ploughs as maize crops grown under these conditions are highly susceptible to moisture stress. Consequently, many villagers, including elderly women, have transitioned to zero-tillage or dry planting. These approaches have proven particularly advantageous for elderly women, as reliance on ox-drawn ploughing services during the rainy season often resulted in delays caused by lengthy queues for such services. In addition, the erratic nature of rainfall patterns heightening the risk of missing crucial planting opportunities. As Mai Reni explained, “We used to wait for the plough, but the rains do not wait for us anymore. Now, I plant with my hands as soon as the first drops fall.” Nevertheless, not all community members have moved away from traditional practices as some individuals continue utilizing ox-drawn ploughs for land preparation, a reflection of the diverse array of adaptation strategies being employed within the village.

The NGOs advised villagers on additional moisture conservation techniques to enhance their agricultural practices. One recommended method involved spreading maize stalks as mulch post-planting to retain moisture and enhance maize maturity during dry spells, a prevalent challenge in recent years. Another effective approach was using cut grass as a cover since the results tended to be the same. Mai Reni highlighted a different technique of digging planting holes and adding manure to allow rainwater to directly nourish maize roots. Research by Hassan and Nhemachena (2008) and Shiferaw *et al.* (2014) corroborates the widespread adoption of these strategies among farmers. These practices offer essential shade and protection for maize crops, increasing their resilience to drought, extreme temperatures, and erratic rainfall patterns. By implementing these methods, farmers can mitigate the impacts of drought and temperature fluctuations and ensure successful crop cultivation.

Mai Reni's experience with zero-tillage farming practices demonstrates the complexities faced by elderly women in adopting new agricultural techniques. Upon returning to Gutsa village in 1982 after separating from her husband, she initially attempted zero-tillage. However, her father strongly disapproved, fearing social stigma associated with his daughter performing manual labour *"kurima nemaoko"* (ploughing with bare hands), traditionally associated with poverty. Her father intervened by ploughing her fields early which was also aimed at deterring baboons but also effectively undermined her initial attempt at zero-tillage. Mai Reni further explored communal agricultural practices through *"majangano"*, a system of shared ploughing and weeding. For a detailed discussion of *majangano* see Worby's (1995) work in Gokwe regarding such work parties and the system of reciprocal obligations a household acquires when others agree to work collectively in its farming activities. However, delays in planting her field and unreliable weeding support from other participants ultimately led her to abandon this approach. Notably, a significant improvement in her maize harvests only occurred upon adopting zero-tillage with the NGO, KAITE Trust in 2012. This collaboration provided her with essential agricultural inputs (fertilizer and seed) in exchange for repayment with a portion of her harvest (eight 50-kg maize bags).

Since she owned cattle, Mai Mizhu continued to prefer planting her maize after ploughing. However, while some elderly women were transitioning from ploughing to zero tillage or making furrows as a cost-saving measure, others who had long favoured

these practices were abandoning them. For instance, Mbuya Gone had practiced zero tillage since settling in the village in the 1980s. Similarly, Mai Tawira, who lived near the eastern edge of the village where the baboons' abode was located also practiced zero tillage. Typically, like other residents in this area she planted immediately after the first rains in late October. This allowed them to stay ahead in maize planting while also spreading the challenge of baboons among the villagers in this eastern side. Mbuya Tawira described her approach: "When the well dries in September, I stop selling vegetables and keep what I have for my family. The sun-dried *mufushwa* keeps us through the hardest months." Planting times also varied across the village as a few villagers usually planted early to mid-November while the majority planted later in November or early December.

While zero tillage emerged as a successful adaptation strategy within Gutsa village, particularly in the face of a changing climate and rising costs, it is not without its challenges. Despite offering reduced tillage costs and improved yield prospects, some elderly women who adopted this practice expressed reservations. The primary concerns centred around increased labour demands. These women found the overall process of zero tillage particularly weeding compacted fields to be physically demanding. Additionally, they encountered more significant weed challenges. Vogel's (1994) study on zero tillage in Zimbabwe supports this observation, noting the tendency for faster weed proliferation in fields not tilled. This resulted in slower weeding progress compared to ploughed or furrowed fields, potentially impacting overall crop health and productivity.

Water Scarcity and Groundwater Depletion

Nelson (2011) highlights the heightened vulnerability of female household heads in coping with climate change stresses. This reality is evident in Gutsa village where elderly women primarily rely on rain-fed agriculture and vegetable gardening. Both activities are highly susceptible to seasonal rainfall variability and groundwater availability. For instance, Mai Mizhu's experience reflects the challenges posed by water scarcity. Previously, her fertile garden near the homestead flourished year-round, enabling her to cultivate vegetables. However, declining groundwater levels forced her to abandon dry season farming altogether. Even during the rainy season, water access remains a hurdle. Though she permitted a young woman from the village to use part of her garden, both struggled with the arduous and often overwhelming task of watering crops during the

scorching months of September and October. Additionally, the challenge of drawing water from the garden well during these dry periods further hindered efforts to maintain vegetable production amid water scarcity

Climate change has necessitated significant adjustments in cropping patterns for elderly women in Gutsa village, particularly in their gardens during non-summer months. Mbuya Tarai's experience serves as a prime example. Previously, she was guaranteed early access to maize by planting maize early in her garden and meticulously watering it until the rains began. While advantageous, this practice presented challenges. Early ripening maize attracted baboons, adding another layer of complexity to the already demanding task of hand-watering until the rainy season. Similarly, Mbuya No's situation highlights the multifaceted challenges these women face. Previously she relied on a dependable well for year-round vegetable cultivation, eliminating the need for expensive vegetable purchases. However, climate change-induced drying of the well forced her to contend with a double burden: the financial strain of buying vegetables and the additional time and labour required for fetching household water.

Mbuya Ku's story exemplifies the harsh realities faced by elderly women in Gutsa village. Once an avid cultivator of tomatoes and leafy greens, her garden was a vital source of income and food security. However, a growing trend in Domboshava (the sale of land by sons and husbands to outsiders) resulted in the loss of her once-productive plot. This not only severed her connection to the land but also eliminated the income stream that previously financed her children's education through vegetable sales. As if mirroring this dispossession, Mbuya Ku's fight against climate change proved equally daunting. Dwindling rainfall caused the well in her garden to dry up rendering it unsuitable for cultivation. Persistent water scarcity thwarted her efforts to continue growing rice, a crop that had made her the village's leading rice farmer. This hardship also forced her to abandon vegetable farming altogether. The situation further worsened when the well at her home dried up in 2012, leaving her entirely reliant on purchasing vegetables causing significant financial strain.

Mbuya Tawira exemplifies the remarkable resilience of elderly women in Gutsa village. Despite facing challenges due to unusually low water levels in her well particularly during the hot and dry season, she manages to cultivate vegetables for both personal consumption and supplemental income. Keenly aware of the limitations brought by water scarcity, Mbuya Tawira strategically reduces vegetable cultivation during the dry season. Additionally, she ceases vegetable sales in August, strategically anticipating

the well drying up in September. This foresight allows her to focus on maximizing personal consumption during this critical period. Furthermore, Mbuya Tawira's resourceful approach extends beyond simply adapting planting times. To ensure food security throughout the dry season, she employs traditional preservation techniques as she sun dries her excess green vegetables and stores them as "*mufushwa",* a nutrient-rich food source available during times of water scarcity.

Prior to the introduction of affordable Chinese motorized water pumps, villagers with limited garden space relied on manual methods like treadle pumps or drawing water from wells and Nyaure River using buckets. While labour-intensive, these methods arguably promoted sustainability. However, the new and efficient motorized pumps brought about unforeseen environmental challenges. While these pumps facilitated increased water extraction, leading to greater irrigation efficiency and expanded cultivation areas, they also had unintended consequences. The ease of extraction encouraged villagers to pump more water, leading to a depletion of water sources earlier in the season, typically by August or September. This earlier drying up of wells and the river disadvantaged villagers like Mbuya Gone who lacked access to pumps and relied on manual methods. Mbuya Gone indicated that if everyone used a "*jug"* (20-liter container) as a low water extraction method this would likely not cause water shortages. Her observation highlights the concern that technological advancements in water extraction might be creating scarcity, impacting not only household water use but also crop production.

With worsening water availability particularly during the dry season, elderly women engaged in year-round vegetable gardening have seen a decline in crop yields. This decline has impacted their ability to transport and sell produce at distant *"kumusika"* markets like Hatcliffe, Showgrounds, or Mbare Musika. The substantial effort required to transport limited produce to these larger markets becomes impractical. As a result, these women have shifted their focus to selling vegetables in nearby areas like Charlotte Brooke suburb adjacent to Gutsa village. However, this shift presents its own set of challenges. For example, Mbuya Gone expressed frustration with the payment practices in the Charlotte Brooke market. Unlike larger markets where cash is exchanged upon delivery, customers in Charlotte Brooke often defer payment, accumulating debts to be settled later. This credit system places Mbuya Gone in difficult situations, forcing her to supply vegetables even when previous debts remain unpaid. Mbuya Gone's experience highlights the advantages of selling at larger more formal markets like *"kumusika"* where

cash transactions ensure immediate payment for produce sold. This financial security is crucial for these women, many of whom rely on vegetable sales for their livelihoods.

Navigating Changing Markets and Livelihoods

The practice of perennial vegetable gardening in Gutsa village is a relatively recent phenomenon which emerged in the mid-1990s. Previously, this approach was more prevalent in nearby villages like Mashonganyika, Chibanda, and Mutsvati. In the study village, vegetable cultivation was traditionally confined to the rainy season and restricted to individual homesteads. Interestingly, the adoption of perennial vegetable gardening in Gutsa coincides with the period when the impacts of climate change were becoming increasingly evident. Faced with changing weather patterns and potentially shorter rainy seasons, residents sought new livelihood options to ensure year-round vegetable production. Perennial vegetable gardens offered a potential solution, prompting their adoption in Gutsa.

As water levels in vegetable gardens dwindled during the dry months (typically August to October, but extending into December in 2015), elderly women managing perennial gardens faced a double challenge. Shrinking water supplies forced them to scale back their vegetable production, resulting in a significant decrease in output. This decline, in turn, prompted them to seek alternative markets for their limited produce. This situation particularly impacted elderly women like Mai Chota, Mai Mizhu, Mbuya Gone, and Mbuya Tawira, who had previously relied on year-round vegetable production for income and food security.

As mentioned earlier, Domboshava farmers with substantial and steady vegetable yields traditionally favoured established markets like Mbare Musika, Hatcliffe, and Showgrounds, despite price fluctuations. However, due to declining output caused by water scarcity, Gutsa farmers increasingly turned to nearby newer suburbs like Charlotte Brooke and Sally Mugabe Heights. These markets offered a seemingly stable alternative, with prices fixed around US$0.50 per bundle throughout the year. In contrast, prices at traditional markets like Mbare Musika were dynamic, ranging from a high of US$3 per bundle to a low of US$1 for ten bundles. Elderly women in Gutsa lamented the decline in profits at these once-lucrative markets, attributing it to the influx of new farmers in Goromonzi district following the year 2000 Fast Track Land Reform Programme (FTLRP). These new farmers, focusing on large-scale vegetable production over cereals, saturated the market with cheaper produce. While the fixed prices in Charlotte Brooke

offered some security, they came with their own challenges. When demand exceeded supply, farmers sometimes exploited the situation by reducing bundle sizes without adjusting prices. Mbuya Gone highlighted that such shortages often occurred towards the end of the month when household budgets were strained, and during the dry season when water scarcity limited production.

The Fast Track Land Reform Programme has had unintended consequences for vegetable production and market dynamics in Gutsa village. Mai Chota, for example, lamented how the program inadvertently transformed small-scale vegetable farmers from surrounding villages into large-scale competitors. These new farmers, fortunate enough to have received land through the FTLRP, have shifted their focus to large-scale vegetable production. She believes these new landholders should prioritize cereal production to ensure national food security, leaving vegetable production to established small-scale farmers like those in Gutsa village. The influx of new producers has exacerbated the challenges posed by water scarcity. Faced with reduced water availability and a saturated market at traditional *"kumusika"* markets, all the elderly women in the study have shifted their focus to nearby markets in Charlotte Brooke and Sally Mugabe Heights. While offering some stability, these new markets are significantly less lucrative. Mai Mizhu reminisces about the pre-FTLRP era when *"kumusika"* sales provided enough income for daily living. Back then, villagers were the primary suppliers to the market. However, the post-FTLRP landscape presents a stark contrast, with meagre market returns that are insufficient to support her extended family.

Mbuya Gone exemplifies the remarkable resilience of elderly women in Gutsa village. She strategically plants rape vegetables in October, a practice that requires meticulous hand-watering throughout the hot and dry month. Despite the effort, this approach guarantees her good returns in later months, making the initial labour worthwhile. However, new challenges have emerged. The influx of producers, particularly during the rainy season when every villager takes advantage of the rain season and abundance of water to plant vegetables has led to market saturation. This situation has unfortunately resulted in progressively reduced returns for Mbuya Gone's vegetable garden over the past few years. Despite her past success as a leading vegetable farmer, she, like many others, now struggles with declining profits. Yet, Mbuya Gone's story, and the stories of the other elderly women in this study, are testaments to their remarkable resilience. They face a multitude of challenges such as low water levels, market flooding, fluctuating prices, and shifting market dynamics. However, as Nelson (2011) defines

resilience as the ability to cope with stresses and recover from adversity, these women demonstrate a remarkable capacity to adapt. Their experiences also resonate with Molua's (2008) observation that climate change necessitates adjustments in agricultural practices. The women in Gutsa, like many farmers facing a changing climate, have adopted new strategies, such as Mbuya Gone's October planting, to navigate these challenges.

Seed Knowledge, Trust and Traditional Varieties

The presence of Seed Co's Rattray Arnold Research Station near Gutsa village fostered a unique symbiotic relationship. For example, intermarriage between villagers and research station employees created a strong social connection. This connection facilitated the exchange of goods that benefited both parties. Seed Co company workers often shared or sold surplus wheat and soyabeans which were necessary for making *"chimodho"* (homemade bread) as well as maize meal and groundnuts to villagers, helping to address their daily dietary needs. Villagers also acquired fertilizers and essential maize seed from Seed Co through various channels, both formal and informal. This access to crucial agricultural inputs contributed to improved crop yields within the village.

During a funeral wake in December 2014, while gathered around one of the fires lit outside for men to warm themselves, the deputy village head recounted a troubling experience in the year 2008. He recalled how villagers faced a near-crisis situation despite receiving ample rainfall that year. The cause? Many had purchased or acquired *"mikono"* (male) maize seed from Seed Co employees seeking to capitalize on the villagers' desire for affordable deals. Unfortunately, this seed turned out to be rejects from seed trials, unsuitable for planting, intended for consumption only. Unaware of this, Gutsa villagers, eager for bargains, unwittingly planted the seed. Despite generous applications of fertilizer and manure, the maize crop suffered, producing small cobs. This incident served as a harsh lesson. Following the failed harvest, most villagers stopped buying seed through informal channels associated with Seed Co, wary of being misled in the future.

As the 2014 rainy season unfolded, a sense of apprehension settled over the villagers of Gutsa. Memories of the 2008 planting season when they unknowingly used inferior maize seed, fuelled their anxieties. This time, their concern stemmed from the disappointing performance of Seed Co maize seed purchased from authorized retailers in Harare and Domboshava. In stark contrast, "*garabha"* seed, a locally bred and meticulously selected variety using the best maize grains from previous harvests, thrived. The villagers' superior results with *garabha* seed fuelled their suspicion that the

commercially packaged Seed Co seed might be counterfeit, especially given its poor performance compared to the trusted local variety. For years, *garabha* seed had served as a reliable alternative for poorer villagers who could not afford hybrid maize seed from stores. This history demonstrated the value and dependability of *garabha* within the community.

Beyond the *"garabha"* maize, women in Gutsa village play a vital role in preserving and sharing a diverse range of seeds such as peanuts, round nuts, *"zviyo"* (finger millet), and sweet potatoes, all crucial for the community's food security. This seed-sharing network extends beyond just *"garabha"* as women rely on a variety of locally sourced or obtained seeds for planting. Their knowledge and practice of using these traditional varieties, passed down through generations, are critical for adapting to the local environment and a changing climate. This reliance on traditional seeds reflects the elderly women's expertise in selecting crops that thrive in their specific surroundings and under prevailing agro-ecological conditions. In essence, it is a strategic response to the uncertainties surrounding the quality of hybrid seeds from formal markets and the increasingly unpredictable climate patterns.

Following the disappointing performance of hybrid maize compared to *garabha* in the 2014-2015 season, a new explanation emerged among villagers. Some suspected a link to the Fast Track Land Reform Program. Their theory? Since the FTLRP, Seed Co had begun subcontracting seed maize production to black commercial farmers across Zimbabwe as it had been doing with white commercial farmers. It was suspected that to maximize profit, due process was not followed in growing seed maize by these new black farmers, who knowingly made available hybrid seed maize they knew to be deficient in quality. Consequently, maize bought from authorized outlets in 2014 performed poorly. This suspicion was reinforced by villagers' observations that those who planted maize seed carried over from the previous year's seed from Seed Co had better crops. Villagers condemned the 2014 seed maize from the authorized outlets as fake, praising *garabha* in the process. Accordingly, elderly women and most villagers increasingly preferred growing *garabha* as an adaptation strategy to cope with unpredictable rains. This practice also resonated with Mushita and Thompson (2013: 2), who acknowledged the advantages of using locally grown open-pollinated varieties of maize in Southern Africa, as they appeared more tolerant to extended dry spells than hybrids.

Livelihood Diversification: Beyond the Field

Elderly female household heads in Africa are no strangers to adapting to challenges. In response to climate change, declining farming capacity, and limited access to inputs, they have adopted a multifaceted approach to ensure food security. This includes narrowing the range of crops they cultivate, allowing for better resource allocation and focused attention on those with higher success rates in the changing climate. Additionally, they have diversified into poultry farming, providing an additional income source and protein for household consumption. Reducing the land, they cultivate allows for more efficient use of available resources, while planting a mix of drought-resistant and non-resistant crops helps mitigate risk by ensuring some level of harvest even during unfavourable seasons. Mbuya Tarai exemplifies these adaptation strategies. She has ceased farming in the Mhinorombe Mountains due to climate change and difficulty obtaining agricultural inputs. This shift reflects a broader trend, as confirmed by research by Mushita and Thompson (2013) and Hassan and Nhemachena (2008), which highlights the importance of crop diversification for managing climate uncertainty. Another example is Mbuya Ku, the sole rice grower in the study who has discontinued rice cultivation due to several factors. The *"jawhi"* conditions (the specific wetland environment necessary for rice) have disappeared, likely due to declining water tables caused by poor rainfall patterns. Furthermore, her sons have parcelled and sold her former rice field, further making it impossible for her to resume cultivation. This shift away from rice aligns with findings by Shiferaw *et al.* (2014), who emphasize the importance of adapting production systems towards activities less vulnerable to changing weather patterns.

All the elderly women in the study, with Mai Chota leading the way, incorporated peanuts into their planting strategies. Recognizing the increasingly erratic rainfall patterns, Mai Chota, the village's most respected peanut farmer, began intensifying her cultivation of small grains, particularly peanuts, starting in 2013. She diversified her production by processing a portion of her harvest into peanut butter, creating a new income stream by selling both locally and beyond the village. Her success was evident. In 2013, she harvested 18 fifty-kilogram bags of peanuts, after selling four fresh at the local market. The following year, her yield increased to 27 bags. Despite facing her own challenges, Mai Chota generously shared her harvest with other villagers in need of seeds.

By October 2014, she had distributed nearly four 50-kilogram bags of peanuts as seed to fellow villagers. While some promised repayment in peanuts or cash, these promises often went unfulfilled. Yet, Mai Chota's act of generosity reflected a shared sense of community, even in the face of hardship.

However, this adaptation towards a few crops like peanuts has had an unintended consequence. The elderly women in Gutsa village have largely shifted away from cultivating a wider range of crops like rice, finger millet *(zviyo)*, sorghum, and rapoko. This decline in planting diversity has unfortunately led to a decrease in the availability of locally bred seeds for these traditionally drought-resistant crops. Mbuya Tarai, concerned about this trend, highlighted the importance of preserving these varieties. She emphasized not only their nutritional value but also their resilience in the face of increasingly erratic rainfall patterns as she believed these traditional crops are crucial for adaptation in a changing climate.

While most elderly women in the village kept chickens, Mai Reni's approach was unique. She focused on free-range chicken rearing, maximizing egg production by separating hens from chicks soon after hatching. This strategy not only provided a steady supply of eggs for visiting relatives but also helped her fulfil the customary offering of a chicken to visitors. Unfortunately, persistent attacks by baboons forced Mai Reni to abandon this method, as her free-range chickens became easy targets.

The challenges posed by climate change also limited comprehensive diversification into livestock across the village. Among the elderly women, only Mai Mizhu had a significant number of livestock, owning four head of cattle and three goats during the fieldwork period. She occasionally slaughtered her goats for food or sold them to generate income for groceries and fertilizer. In 2013, she even sold a cow to finance construction of a new house on her homestead. However, this transaction turned sour when the buyer, claiming to run a butchery, paid only half of the agreed price (US$300) and then disappeared. Despite repeated attempts, Mai Mizhu was unable to recover the remaining balance.

In 2002, Mbuya Gone joined the Salvation Army Church's dairy cattle pass-on project and completed a one-week course in Basic Dairy Husbandry. Unfortunately, her first cow experienced a stillbirth. However, it later gave birth to a healthy calf, which she passed on to another member of the group after nine months. Subsequently, the cow bore another calf, and Mbuya Gone began milking it, selling the milk in the village. Tragically, the cow fell ill and had to be slaughtered after ingesting some clothes hung out to dry at

a neighbouring homestead. Though she sold the meat in the village, it did not yield significant earnings. Unfortunately, the calf also fell ill after ingesting a towel and had to be slaughtered. Mbuya Gone bartered some of the meat for thirty-six kilograms of maize, but once again, the earnings were modest. Despite not quantifying her milk earnings, she recalled making a comfortable living from selling it. On an average day, she milked close to five litres from the cow, ensuring a steady supply of milk for tea, sour milk to accompany *sadza*, and surplus to share with relatives.

To grow or not to grow crops in a changing climate context

Observations in Gutsa village during March 2015 revealed a striking disparity in maize crop performance between recently arrived settlers and long-time residents. New settlers who had purchased and cultivated fields enjoyed significantly more robust maize growth compared to established residents who farmed their traditional lands. The key factor behind this difference? The newly acquired fields boasted richer, more fertile soil which proved to be highly conducive to crop growth even without extensive fertilizer application. This fertility was attributed in part to extended periods of lying fallow as some fields had been fallow for close to twenty years. Consequently, these new settlers generally achieved healthier crop yields as compared to the original residents who struggled with depleted soil conditions. The 2014-2015 rainy season further exacerbated these challenges. Prolonged dry spells disrupted fertilizer application schedules, negatively impacting crop health. Faced with unfavourable weather patterns, villagers became hesitant to apply fertilizer on maize crops that showed limited prospects of maturing. With each passing day, their anxieties mounted as the threat of a poor harvest loomed large. The sentiment of *"Iyi inzara takarima"* ("This is still hunger even though we planted") became increasingly common, reflecting their growing apprehension about the agricultural outcomes in the face of a difficult climate.

For villagers in Gutsa, the saying "*Nzara wakarima"* ("Hunger even though you planted") captured a harsh reality. Unlike true hunger from neglecting to plant (*"Nzara uchiziva hako kuti hauna kurima"*), *"Nzara wakarima"* represented the despair of wasted resources (time, labour, and money) on a crop with uncertain returns. Many young families facing this economic reality opted out of large-scale maize cultivation. The math simply did not add up. Investing nearly US$270 on ploughing, seeds, fertilizer, and labour offered no guarantee of exceeding a two-tonne harvest. Conversely, the same amount could purchase nearly two tonnes of maize after prices dropped post-harvest. This

economic logic led to the popular saying among young men, *"Ndinorima chibage kwa OK"* ("I grow my maize at OK"), a reference to a major retail chain. These households often with income from non-farm labour opted to buy maize rather than invest in cultivating it themselves. Selling harvested maize immediately after harvesting was a common strategy which provided funds for essentials and inputs for the next season (also see Worby 1995).

Interestingly, maize planted near the front and back of most houses in Gutsa village displayed consistently healthy growth, even when surrounding areas suffered from nutrient deficiencies and moisture stress. This unexpected fertility stemmed from unique local practices. Households often disposed of ash from cooking fires in these specific locations, unknowingly enriching the soil with essential minerals. Additionally, residents commonly used these areas for nighttime urination, and containers used for indoor urine collection were emptied there in the mornings. Toddlers learning toilet routines also frequented these spots, further contributing to the soil's fertility through organic matter. While unconventional, these practices functioned as a natural, localized fertilizer source, boosting maize growth in these zones.

Diversifying into non-farm and multiple livelihoods to adapt to climate change

Faced with climate challenges, elderly female household heads in Gutsa village have increasingly looked beyond the fields to secure their livelihoods. This shift towards livelihood diversification aligns with research by Ulrich *et al.* (2012), emphasizing the importance of non-farm income generation for rural households. The elderly women in Gutsa are exploring new avenues such as leasing rooms to outsiders, engaging in petty trade, and participating in *"mukando"*, a village savings group where members contribute and borrow money at low interest. These activities not only supplement their income from farming but also contribute to their economic independence and resilience. This approach resonates with the work of scholars like Nelson (2011), Batterbury (2008), and Hassan and Nhemachena (2008) who highlight the importance of livelihood diversification as a buffer against crop failure due to climate change. In the village, diversification is seen to not only enhance productivity but also create linkages between different economic sectors within the community and beyond. As Berkvens (1997) suggests, diversification and productivity enhancement are key components of rural development, allowing

communities to exploit connections between sectors and maximize economic opportunities.

The FTLRP carved new settlements from former commercial farms bordering Gutsa village with these new settlements being Charlotte Brooke (high-density) and Sally Mugabe Heights (low-density). This influx of new residents purchasing land or renting houses altered the village's demographic landscape. Recognizing the proximity to Harare as an advantage some villagers began selling land or renting out houses to these newcomers. However, among the ten elderly women studied, only Mbuya No had started renting out a spare bedroom to a tenant working in Charlotte Brooke since 2013. This shift towards rental income reflects a broader trend, as documented by Paradza (2009, 423). Paradza highlights the growing importance of alternative income streams like rentals for elderly individuals in Zimbabwe's economic climate. Rental income provides a buffer against the uncertainties of a nonperforming economy, especially for those facing declining agricultural output.

In 2012, Mai Reni's entrepreneurial spirit received a boost. Her daughter, recognizing the challenges of supporting both her own family and her mother's needs provided seed capital for Mai Reni to invest in body lotions and soaps for resale. This marked a diversification from Mai Reni's previous focus on selling peanut butter. She strategically expanded her inventory to include these new items along with used clothing sourced from Mupedzanhamo, Harare's main market for second-hand clothes. Mai Reni being a meticulous businesswoman, maintained records of customers who purchased on credit, expecting payment at month's end. Unfortunately, some customers proved unreliable, leading her to identify those with a history of late payments and subsequently refuse them further credit. This experience reflected the importance of responsible credit management in her business. Her customer base extended beyond Gutsa village as Mai Reni's sales reached the former Chibvuti farm, Seed Co farm, neighbouring Ngwerume village, and even the new Charlotte Brooke suburb. She also embraced barter transactions, exchanging her goods for essential commodities like cooking oil, sugar, or grains such as wheat, maize, beans, and cowpeas. For example, a US$1 lotion could be traded for either two cups of beans, two cups of sugar beans, or three cups of cowpeas. This bartering system ensured she obtained necessary household items while generating income.

Mai Reni's barter trading with residents of Chibvuti and Seed Co farms was mainly focused on essential items for her household. Here she frequently exchanged goods for soybeans and wheat which were the staples she used for baking homemade

bread. For instance, in September of 2014 she traded a US$1 lotion for the village's standard measure of six kilograms of maize. With this she was effectively acquiring maize at a rate of US$3 per eighteen kilograms which was well below market prices then at US$6. Through these barter trade transactions, Mai Reni managed to accumulate an additional seventy-five kilograms of maize to supplement her harvest within three months. Here it is important to note that Mai Reni just like most women in the village never bartered away their own household's staple foods. However, she did acknowledge instances where some wives secretly bartered staple foods within their households without their husbands' knowledge. This practice highlights the gendered dynamics of resource control within families. Apusigah (2009) describes similar restrictions on women's control over household staples in Northern Ghana where women often require male approval before selling such items. In contrast, the women of Gutsa village demonstrate more agency, actively participating in unauthorized sales of food items. These transactions subtly challenge traditional male dominance over household resources, allowing women to fulfil their own consumption needs and desires. However, it is not always an equal exchange as Mai Reni also mentioned cases where women were exploited in these barter tradings, receiving less value than their goods were worth. These instances highlight the complexities within these seemingly empowering transactions.

Mbuya Gone's income-generating activities extended beyond her vegetable production. Before transitioning to year-round vegetable farming, she supplemented her income by buying and selling vegetables from Mashonganyika village. She also displayed remarkable skill in knitting doilies, finding customers in both Borrowdale, a nearby suburb, and among South African cross-border traders from Mungate village. Mbuya Gone was not alone in her resourcefulness. Along with other village women she would work for farmers in Mashonganyika village on market days where they would assist with vegetable picking in exchange for payment in vegetables. These vegetables would then be repacked into smaller bundles and sold in Borrowdale, generating additional income. Traditionally, this activity served as a dry season venture for Mbuya Gone, allowing her to focus on her fields during the rainy season. However, even after her shift towards full-time vegetable farming, this practice continued to be a source of income for other elderly women in the village.

There is no doubt that the village bustled with alternative income strategies beyond agriculture. In November 2014, I observed Mbuya Ku, a woman of remarkable age (evidenced by her daughter, Mai Reni, a study participant, already being over sixty!),

diligently breaking down boulders into gravel using a hammer. This activity, previously observed among younger residents, catered to the high demand for construction materials in the newly established Charlotte Brooke suburb. Mbuya Ku's dedication exemplifies the resourcefulness and resilience of the elderly population in Gutsa village. In addition, Mbuya Ku's involvement in a *"mukando"* savings group demonstrates the various financial strategies adopted by women in Gutsa village. In the village, *mukando* groups, typically composed of women of all ages, pool resources by contributing a set amount monthly (US$10 in Mbuya Ku's group). Members can borrow from the collective funds and even lend money externally at an interest rate *(chimbadzo)*. The prevalence of *mukando* aligns with observations in Kenya by Ulrich *et al.* (2012) regarding the dominance of women in informal savings groups.

Mbuya Ku's participation in *mukando* reflects a broader trend in Gutsa village with women playing a key role in facilitating credit arrangements within the community. This echoes Huisman's (2005) observation that rural African households often rely on informal credit sources like friends, neighbours, or relatives, rather than formal financial institutions. In Gutsa village, *chimbadzo*, another lending practice, operates alongside *mukando*. While *chimbadzo* interest rates can be high (up to 50% monthly), *mukando* offers a more favourable rate of 10% to members. Of all the elderly women in this study it was only Mbuya Ku who participated in *mukando*. Mbuya Ku's entrepreneurial spirit extended beyond financial planning. Recognizing a business opportunity, she capitalized on the proximity of her homestead to a route used by "pirate taxis" (informally operated minibuses). In September 2015, she opened a stall near her home to cater to passengers waiting for transportation, demonstrating her resourcefulness and ability to adapt to changing circumstances.

Widespread deforestation in Gutsa village had a ripple effect on seasonal economic activities. One casualty was the harvesting and selling of *mazhanje (Uapaca kirkiana)*, a rainy season activity many villagers relied on. Traditionally, *mazhanje* was sold to middlemen for US$1 per eighteen kilograms. A few enterprising villagers, like Mai Njere, took the riskier route of selling directly on Harare's streets, fetching prices between US$3 and US$5 per eighteen kilograms, but facing the constant threat of confiscation by municipal police.

These findings are consistent with research by Shambel (2012) in Ethiopia, which found that climate challenges deepen existing gendered inequalities. Similarly, Hassan and Nhemachena (2008) highlight that adaptation strategies are shaped by access to

resources and credit, echoing the experiences of women in Gutsa village. By foregrounding the perspectives of elderly women in Gutsa, the findings highlight the urgency of including marginalized voices in climate adaptation policy and research across sub-Saharan Africa, echoing and extending recent calls for more inclusive approaches.

Conclusion

This study has explored how elderly female household heads in Gutsa village navigate climate change through adaptive strategies grounded in cultural knowledge, community engagement, and innovation. Despite growing environmental stressors, these women demonstrate remarkable resilience, adapting through shifts in farming, seed preservation, and economic diversification. Three core insights emerge. First, local knowledge, especially around seed selection and water management, serves as a powerful tool for adaptation. Women increasingly rely on open-pollinated varieties like *garabha*, whose performance surpasses hybrid seeds in uncertain weather conditions. Second, the shift away from traditional agro-based livelihoods toward non-farm and informal income-generating strategies such as barter trade, gravel sales, and *mukando* savings groups reveals how adaptation extends beyond agriculture. Third, age and gender intersect to shape both vulnerabilities and adaptive capacities, with older women constrained by reduced physical labour, land insecurity, and exclusion from formal support systems.

These findings demonstrate the urgency of inclusive climate policy. Programs that support local seed systems, subsidize water-saving technologies, and formally recognize informal markets and savings groups could significantly strengthen rural women's adaptation efforts. Land reform efforts must also consider the differentiated impacts on smallholders, especially elderly women whose livelihoods depend on stability and access. Through detailed ethnographic engagement, I have traced how elderly female household heads in Gutsa develop and adapt their strategies in response to changing climatic realities. The experiences documented here offer fresh insights into ongoing discussions about gender, aging, and adaptation to climate change in rural southern Africa. The study highlights the importance of integrating elderly rural women's perspectives into adaptation planning, both in Zimbabwe and across Sub-Saharan Africa. It would be valuable for future studies to explore the long-term sustainability of these non-farm livelihood strategies and explore how generational knowledge transfer affects community resilience in the face of accelerating climate disruptions.

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