Small Grain Production as an Adaptive Strategy to Diet Diversification: A Case of a Selected Village in Norton Rural District, Zimbabwe

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Abstract

Small grains have historically played a vital role in global food systems but have been marginalised due to the rise of modern cereals. Recently, there has been renewed interest in these climate-resilient and nutrient-rich crops as a strategy to combat food insecurity and enhance dietary diversity. This study explores small grain production in a selected village in Norton Rural District, Zimbabwe, focusing on its contribution to diet diversification and fostering community resilience. Employing a qualitative case study design, 15 households were purposively interviewed from a population of 138 households actively engaged in small grain cultivation. Findings revealed that small grains, such as millet, sorghum, and rapoko improved nutritional outcomes and provide resilience against climatic variability. However, adoption was hindered by negative cultural perceptions, limited extension support, and infrastructural challenges. This study concludes that targeted policy interventions, gender-sensitive support mechanisms, and community awareness programs are critical to revitalising small grain production. Integrating traditional foodways into contemporary food systems can foster sustainable nutrition and climate adaptation in Zimbabwe and similar contexts.

Keywords: Small grains, Diet diversity, Traditional crops, Agroecology.

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1. Introduction

1.1. Global Context of Small Grain Production

Cultivating small grains has garnered renewed interest globally due to their resilience in the face of climate variability and their significant nutritional benefits. According to the Food and Agriculture Organization [FAO] (2022), small grains, such as millet, sorghum, and teff, are increasingly cultivated in arid and semi-arid regions as climate-resilient alternatives to conventional cereals. These crops exhibit high tolerance to drought and require minimal inputs, rendering them particularly suitable for low-resource farming systems. Beyond their agronomic benefits, small grains are rich in essential micronutrients, such as iron, calcium, and zinc, which play a vital role in combating hidden hunger and malnutrition (Lukman et al., 2021). The global shift toward diversifying food systems is also reflected in research and policy recommendations promoting indigenous grains for environmental sustainability and public health.

Climate change has further intensified the need for agricultural diversification, especially in regions vulnerable to extreme weather patterns. In sub-Saharan Africa, small grains have gained increasing recognition for their role in safeguarding food security amid unpredictable climatic conditions (Mugendi et al., 2020). This trend underscores the global urgency to strenghten resilient farming systems, particularly in rural communities where food insecurity is closely tied to the reliability of seasonal rainfall.

1.2. Shifting Grain Trends in Zimbabwe

Zimbabwe presents a compelling case of cereal transition, where the predominance of maize production has overshadowed the cultivation of traditional grains. Since the colonial era, maize has become the staple grain, supported by state-led policies and commercial seed systems that marginalised local varieties (Manyeruke et al., 2019). While initially aimed at enhancing food security, this shift has inadvertently heightened the country's vulnerability to climate-induced crop failures. The country's current

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agricultural strategy, as articulated in the Zimbabwe National Development Strategy 1 (2021–2025), seeks to revitalise traditional grain farming as a measure to restore biodiversity and improve adaptive capacity to climate stressors.

Recent government initiatives, such as the Pfumvudza/Intwasa Conservation Agriculture Programme, have explicitly included small grains among the targeted crops, marking a policy reversal that acknowledges the ecological and nutritional value of these grains (Ministry of Lands, Agriculture, Fisheries, Water and Rural Development, Zimbabwe, 2022). Despite this policy support, uptake remains uneven due to lingering perceptions of traditional grains as inferior and labour-intensive.

1.3. Clarifying Terminology: Small Grains, Traditional Grains And Indigenous Grains

Within Zimbabwean agricultural discourse, terms, such as "small grains," "traditional grains," and "indigenous grains," are often used interchangeably. For the purposes of this study, these terms refer to a group of cereal crops including finger millet (rukweza), pearl millet (mhunga), and sorghum (mapfunde). While "small grains" typically refer to the physical size of the cereal kernels, "traditional grains" and "indigenous grains" emphasise their cultural and historical significance within local communities (Chivenge et al., 2015). This synonymity will be maintained throughout the paper to reflect local usage and policy language.

1.4. Presenting the Problem: Food Insecurity and Decline in Indigenous Crops

Zimbabwe continues to experience chronic food insecurity, with over 5.6 million people estimated to be food-insecure during the lean season of 2022–2023 (ZIMVAC, 2023). This crisis is partly attributed to the overreliance on maize monocropping, which suffers severe yield losses during drought. Once central to Zimbabwean diets, indigenous grains have been systematically neglected in favour of hybrid maize varieties, resulting in the erosion of traditional agricultural knowledge and biodiversity (Nyikahadzoi et al., 2020).

Monocropping has led to unsustainable land use patterns and increased susceptibility to pests, further exacerbating the food security dilemma. Case studies from regions, such as Masvingo and Matabeleland South, demonstrate that communities that maintained small grain cultivation showed greater resilience during drought periods, suggesting the untapped potential of these crops in enhancing household food access (Mutenje et al., 2019). Reviving small grain production thus represents a practical and strategic response to current agricultural challenges.

1.5. Purpose and Research Questions

The purpose of this research is to investigate the role of small grain production as an adaptive strategy to diet diversification in the context of Norton Rural District, Zimbabwe. Specifically, this study aims to understand how small grain cultivation contributes to household food security and nutritional improvement. This objective is pursued through the following research questions:

1. What motivates households in Norton Rural District to produce small grains?

2. What dietary and livelihood outcomes are associated with small grain consumption?

3. What constraints limit the adoption and expansion of small grain farming in the study area?

These questions are grounded in a qualitative research approach that foregrounds local experiences and perceptions.

1.6. Significance of this Study

This study contributes to the broader discourse on food system diversification and climate adaptation by foregrounding the localised experiences of smallholder farmers. In an era of increasing climatic uncertainty, exploring the adaptive potential of indigenous crops is timely and essential. This research provides empirical insights into how small grain production supports dietary diversification, a recognised pillar of food and nutrition security (Burchi et al., 2018).

Furthermore, the study aligns with national and global efforts to build sustainable and inclusive agricultural systems. By documenting the enablers and barriers to small grain production in Norton, the findings can inform targeted policy interventions, extension services, and community-based strategies aimed at revitalising traditional farming knowledge and practices. Ultimately, the research underscores the need to re-centre indigenous crops in both policy and practice as part of a resilient rural development agenda.

1.7. Research Gaps and ratIonale for this Study

While the literature affirms the resilience and value of small grains, most studies are either national in scope or focused on drought-prone provinces, such as Masvingo, Matabeleland, or Manicaland. Very few explore the dynamics in peri-urban rural districts like Norton, where land-use pressure, climate variability, and changing dietary preferences intersect in unique

ways. Furthermore, there is limited qualitative research capturing household-level perspectives on small grain production and diet diversification, particularly from the lens of indigenous knowledge systems.

This study addresses this gap by focusing on a micro-level case in Norton Rural District, where 15 households out of a population of 138 were purposively sampled. It seeks to understand how smallholder farmers in this locality engage with small grains to enhance food security, reclaim traditional diets, and build climate resilience. By foregrounding lived experiences, the study contributes to a growing body of knowledge that calls for decolonising food systems through agroecological and culturally appropriate interventions.

2. Theoretical and Conceptual Framework

2.1. Agroecology and its Relevance to Small Grain Production

Agroecology is a foundational framework for understanding the resurgence of small grain production, especially in the context of climate change, ecological fragility, and the erosion of indigenous knowledge systems. It integrates ecological principles with socio-cultural practices, enabling farming systems that are both resilient and sustainable (Wezel et al., 2009). By promoting biodiversity, local seed use, and low-input farming, agroecology challenges the dominant monocultural agricultural models that have long undermined traditional crops, such as small grains. Scholars like Altieri et al. (2020) underscore that agroecological systems are more environmentally sustainable and socially just, as they place value on farmer autonomy and ancestral farming practices. This lens is critical for understanding small grain farming in Zimbabwe, where farmers often operate within marginal agroecological zones.

In the case of Norton Rural District, agroecology offers explanatory power for the community's shift back to traditional grains like finger millet and pearl millet. These crops require fewer external inputs, are well-suited to dryland farming, and support agro-biodiversity. Furthermore, agroecology links localised knowledge with environmental stewardship, making it instrumental in promoting food and seed sovereignty (Pimbert et al., 2021). Therefore, the framework guides this study's focus on how local farmers leverage indigenous ecological knowledge to adapt to contemporary climatic and economic disruptions.

2.2. Food Sovereignty and Localised Food Systems

The concept of food sovereignty, championed by the global peasant movement La Via Campesina, provides a complementary analytical lens. Food sovereignty asserts the rights of people to healthy, culturally appropriate food produced through ecologically sound and sustainable methods (Patel, 2012). Unlike the conventional food security approach, which focuses on availability and access, food sovereignty emphasises control over food systems, including decisions about what is grown, how it is grown, and who benefits from it. As Nyéléni Declaration (2007) contends, food sovereignty restores decision-making power to communities and values traditional agricultural knowledge.

In the Zimbabwean context, state-driven policies have historically favoured maize through subsidies and research investment, sidelining small grains and thereby limiting farmer autonomy. However, food sovereignty frameworks validate the actions of communities in resuscitating small grains as a cultural and ecological imperative. Research by Matondi et al. (2021) reveals how communal areas in Zimbabwe are reclaiming food sovereignty through seed fairs, participatory breeding, and community granaries that centre local preferences over commercial imperatives. This approach not only diversifies the food base but also strengthens community resilience in the face of erratic rainfall and economic volatility.

Food sovereignty thus becomes a critical lens in this study, helping unpack the role of local agency in food system transformation. It allows for a nuanced understanding of how communities resist dependency on state and market-led solutions by asserting their own food priorities and reclaiming traditional grains.

2.3. Integrating Agroecology and Food Sovereignty in this Study

Together, agroecology and food sovereignty offer a robust conceptual framework for analysing small grain revival in Norton Rural District. While agroecology explains the ecological and technical aspects of crop suitability and adaptation, food sovereignty foregrounds the political and cultural dimensions of food choice and control. These frameworks are not mutually exclusive; rather, they are co-constitutive. Both assert the importance of farmer knowledge, biodiversity, and autonomy in building resilient food systems (Rosset & Altieri, 2017). They challenge dominant narratives of modernisation and offer pathways that reconnect people, culture, and ecology.

In this study, the frameworks has been applied to analyse how households in the selected village engage with small grain production not only as a farming choice but also as a culturally and politically motivated practice. The intention is to reveal how local actors exercise agency, revalorise neglected grains, and engage in adaptive strategies that challenge mainstream agricultural paradigms. This research contributes to wider conversations on sustainable agriculture, indigenous knowledge, and food justice in Southern Africa.

2.4. Global and Regional Marginalisation and Resurgence of Small Grains

Historically, small grains, such as millet, sorghum, and teff, were staple foods across many African and Asian regions. However, post-Green Revolution agricultural paradigms led to the prioritisation of high-yield cereals like maize, wheat, and rice at the expense of these traditional grains (Pingali et al., 2021). This marginalisation was due to colonial agricultural restructuring and due to structural policies favouring standardised monocultures, particularly in India and parts of sub-Saharan Africa. In India, for example, finger millet and pearl millet cultivation declined as rice and wheat were heavily subsidised under the Public Distribution System (Chivenge et al., 2015). A similar shift occurred in the Sahel, where millet and sorghum were relegated to marginal lands, even though they remain crucial to subsistence farmers facing erratic rainfall.

Recent years have witnessed a resurgence in the promotion of small grains, largely driven by global recognition of their climate resilience and nutritional benefits. In Ethiopia and Kenya, agricultural strategies increasingly acknowledge the potential of teff, millet, and sorghum in food security frameworks (Tesfaye et al., 2020). These developments are further echoed by the Food and Agriculture Organization (FAO), which promotes small grains as future-smart crops under its climate-smart agriculture initiative. The shift signals a paradigmatic return to neglected food systems, affirming their cultural, environmental, and health significance.

2.5. Zimbabwean Scholarship on Small Grains and Climate Change

In the Zimbabwean context, small grains, such as pearl millet, sorghum, and rapoko, have historically played a pivotal role in traditional diets, particularly in semi-arid regions. However, colonial and post-independence agricultural policies gradually displaced them in favour of maize production, a shift reinforced by the Grain Marketing Board's pricing incentives and storage policies (Mashingaidze et al., 2021). As climate variability intensifies, scholarly interest in small grains has resurged. Research by Manyeruke et al. (2022) confirms that sorghum and millet outperform maize in drought-prone districts like Chivi and Buhera, offering a lifeline to resource-constrained farmers.

Studies by Muzamhindo et al. (2023) argue that small grains are not only ecologically appropriate but also economically viable if value addition chains are improved. Yet, institutional support for their expansion remains inconsistent. The Command Agriculture programme, for instance, continues to prioritise maize, undermining efforts to mainstream traditional grains. This imbalance reflects a broader policy neglect that Zimbabwe must urgently address to build a resilient food system.

2.6. Nutritional and Climatic Advantages of Small Grains

Nutritionally, small grains are superior in key micronutrients. Sorghum and millet, for instance, are rich in iron, calcium, and fibre, offering alternatives to maize-dominated diets that are often deficient in micronutrients (Kebede et al., 2019). These grains also exhibit low glycaemic indices, making them suitable for managing diabetes and other lifestyle conditions, which are increasingly common in both rural and urban Zimbabwe.

In the context of climate change, small grains possess adaptive traits, such as deep root systems, short growing seasons, and high tolerance to heat and water stress. These characteristics make them vital for food security in drought-prone zones like Norton District. Empirical studies by Jiri et al. (2020) demonstrate that households cultivating millet and rapoko in arid zones not only experience fewer crop failures but also show improved household dietary diversity. This adaptive capacity underscores the necessity of repositioning small grains in mainstream agricultural planning.

2.7. Challenges Facing Small Grain Production

Despite their advantages, the cultivation and consumption of small grains face multiple constraints. A major hurdle is limited market access. Most formal markets remain structured around maize, reducing incentives for farmers to grow small grains beyond subsistence. In addition, there is inadequate investment in agronomic research for traditional crops. Extension services often lack updated knowledge and training to support farmers growing millet or rapoko, particularly in peri-urban areas like Norton

(Mutambara et al., 2021). Furthermore, small grains are labour-intensive to process and require specific post-harvest handling techniques that are often unavailable in rural communities.

Policy frameworks also continue to prioritise cash crops and cereals with export potential, further marginalising small grains. Although Zimbabwe's Food and Nutrition Security Policy recognises the role of traditional foods, implementation is inconsistent. For example, input support programmes rarely include sorghum or millet seed varieties, and subsidy schemes remain maize-centric. Without a deliberate shift in institutional focus, the potential of small grains may remain underutilised despite mounting evidence of their benefits.

2.8. Gender Dimensions in Traditional Food Systems

Women are central to the cultivation, processing, and preparation of small grains. Studies by Matondi et al. (2020) indicate that women in rural Zimbabwe possess invaluable indigenous knowledge related to seed selection, storage, and recipe innovation using sorghum and millet. Yet, their contributions are often overlooked in policy and programming. Moreover, patriarchal land tenure systems limit women's access to land, credit, and extension services, undermining their capacity to lead in small grain revival.

Evidence from communal areas around Norton reveals that while women dominate small grain farming at the household level, they lack representation in decision-making structures like cooperatives or ward-level agricultural committees. This gendered disparity reflects broader systemic issues in agricultural development and must be addressed to create inclusive and sustainable food systems. Empowering women through training, land rights, and market access can accelerate the revalorisation of traditional grains and their reintroduction into diversified diets.

3. Methodology

This study employed a qualitative exploratory case study design to understand how small grain production functions as an adaptive strategy for dietary diversification in a rural-urban transitional context. A case study design was most appropriate for this research because it enabled in-depth exploration of localised farming practices, lived experiences, and socio-cultural dynamics within a single village setting. Qualitative methods are particularly useful in uncovering meanings and interpretations embedded in everyday practices, especially in contexts where community knowledge and values play central roles (Creswell & Poth, 2018). The selected village in Norton Rural District, located on the periphery of Harare, was purposively chosen due to its dual exposure to rural agrarian traditions and urban influences. The area is characterised by mixed subsistence and semi-commercial agricultural activities, and small grains have re-emerged as a strategic response to erratic rainfall and food insecurity.

Out of a total population of 138 households, 15 were purposively selected based on active involvement in small grain farming, gender representation, and a minimum of five years of farming experience. This approach ensured the inclusion of information-rich participants capable of articulating detailed accounts of their agricultural and dietary practices (Palinkas et al., 2015). Data were collected through semi-structured interviews, oral histories, and field observations, facilitating triangulation and deepened contextual understanding. Interviews explored participants' motivations, challenges, and perceptions surrounding small grain usage, while oral histories captured generational shifts in food production and consumption. Observations provided additional insights into storage methods, field preparation techniques, and meal preparation practices. Ethical standards were upheld through informed consent, confidentiality, and cultural sensitivity in line with guidelines by Orb et al. (2001). Data were manually coded and analysed thematically using categories informed by this study's conceptual framework. Emerging themes were refined to align with the objectives of exploring food sovereignty, climate resilience, and dietary diversity.

4. Results

4.1. Participant Characteristics

Table 1 presents a summary of the 15 interviewed households coded as P1 to P15 and includes gender, years of farming experience, crops grown, and education levels. Education categories included primary, secondary, advanced level, certificate, diploma, and degree, reflecting the range of formal education among participants.

The data revealed that female participants (9 out of 15) dominated small grain cultivation in the sample, consistent with the literature emphasising women's critical role in traditional agriculture. The years of farming varied widely, with most participants having over a decade of experience, providing a rich base of knowledge. Education levels were generally moderate,

with most having secondary education; a few possess certificates or diplomas, while some have only primary schooling. This diversity suggests varying access to formal agricultural knowledge and training, which may influence production practices and adaptation strategies.

Table 1. Socio-demographic Profile and Crops Grown by Participants

Participant	*Gender*	*Years Farming*	*Crops Grown*	*Education Level*
P1	Female	20	Millet, Rapoko	Secondary
P2	Male	25	Sorghum, Millet	Certificate
P3	Female	10	Rapoko	Primary
P4	Male	30	Sorghum	Diploma
P5	Female	15	Millet, Sorghum	Secondary
P6	Male	22	Millet, Rapoko	Advanced Level
P7	Female	12	Rapoko	Primary
P8	Female	18	Millet, Sorghum, Rapoko	Secondary
P9	Male	35	Sorghum, Millet	Certificate
P10	Female	8	Millet	Primary
P11	Female	16	Rapoko	Diploma
P12	Male	27	Millet, Sorghum	Secondary
P13	Female	14	Millet	Secondary
P14	Male	19	Sorghum, Rapoko	Certificate
P15	Female	21	Millet, Rapoko	Secondary

4.2. Household Use and Nutritional Benefits

The data from semi-structured interviews, oral histories, and field observations demonstrated that small grains, millet, rapoko, and sorghum, significantly contributed to dietary variety in households. Participants commonly used these grains in traditional foods, such as porridge, sadza, and fermented beverages, offering nutritional benefits alongside staple maize.

One participant (P5) described, *"We prepare millet porridge every morning; it gives the children energy and helps them stay healthy during the dry months."*

Another participant (P12) emphasised the role of sorghum, saying, "Sorghum sadza fills the stomach better than maize, and it doesn't cause stomach problems."

These verbal accounts are supported by oral histories, which trace the use of small grains back several generations, suggesting long-standing recognition of their dietary importance. Field observations during household visits confirmed the frequent preparation of these dishes, with women demonstrating cooking techniques.

Across all data sources, there was clear consensus that small grains improve nutritional outcomes, particularly in resisting malnutrition and providing dietary diversity. This finding is consistent with broader research indicating the micronutrient richness of small grains and their role in combating food insecurity (Midega et al., 2021; Gebrelibanos & Melesse 2020). The consistency of responses underscores the integral role of small grains in household diets in this community.

4.3. Traditional Knowledge and Practices

Traditional knowledge surrounding small grain cultivation is deeply embedded in the community's cultural fabric. Interviewees described inherited planting techniques, such as sowing timing aligned with first rains and careful seed selection to optimise yield.

Participant P3 explained, *"My grandmother taught me to plant rapoko just after the rains start, so the crop can survive if it stops raining."*

This illustrates the intergenerational transmission of ecological knowledge. Communal seed exchange was another salient practice. Participants frequently engaged in informal seed sharing to ensure access to diverse and resilient crop varieties. Oral histories recounted how these exchanges reinforced community bonds and helped preserve genetic diversity critical for adaptation. During field observations at a local seed exchange event, the social and practical importance of this system was evident, with farmers discussing seed characteristics and best practices.

The convergence of interview data, oral histories, and direct observation confirms the vitality of traditional knowledge systems in sustaining small grain production. These practices provide ecological and social resilience, supporting the argument that agroecological approaches are crucial for climate adaptation (Baudron et al., 2021).

4.4. Challenges

Despite clear benefits, several challenges limit the potential of small grains. Labour intensity was widely cited as a significant constraint.

Participant P7 noted, *"Planting and harvesting millet takes more effort and time compared to maize."*

This was corroborated by oral histories that recalled the demanding nature of traditional farming, often reliant on manual labour.

Market access emerged as a critical barrier. Several respondents expressed frustration at the lack of stable buyers and fair pricing.

P9 remarked, *"Sometimes we have more sorghum than we can sell, and there is no guarantee of income."*

Field observations showed few commercial outlets for small grain products, and promotional materials were scarce.

Government extension services were reported as inadequate, with farmers often left without technical support or inputs. This gap was echoed in interviews and oral histories, indicating a long-term neglect in policy and resource allocation.

A socio-cultural challenge identified was the negative perception of small grains among youth, who often associate these crops with poverty or backwardness.

Participant P14 stated, *"Young people don't want to grow rapoko because they say it is for old people."*

This reflects a generational divide that threatens the sustainability of small grain traditions. The consensus among data sources highlights the urgency of addressing both economic and social obstacles.

4.5. Role of Women and Elders

Women prominently lead in seed selection, preparation, and preservation of small grains. Interviews revealed that women manage most household food production decisions, ensuring seed quality and food safety.

Participant P11 explained, *"It is my duty to save the best seeds and make sure the family eats nutritious food."*

This leadership role is well documented in agrarian studies focusing on gender dynamics in African rural settings. Elders function as custodians of knowledge, maintaining oral traditions related to seed use and strategies for coping with drought. During oral history sessions, elders shared narratives of past climatic challenges and adaptive responses, reinforcing community memory and resilience. Observations at community meetings underscored elders' respected status and their role in mentoring younger farmers. The agreement across all data sources highlights the centrality of women and elders in sustaining small grain production and knowledge transmission.

4.6. Emerging Opportunities

Recent engagement with NGOs and local markets offers promising avenues for small grain promotion. Participants noted that community nutrition fairs now regularly showcase small grain products, raising awareness and demand.

P2 observed, *"Since the NGO started promoting millet, more people are interested in buying and growing it."*

Field observations at such fairs confirmed active participation and positive reception from community members.

These developments align with national policy efforts to diversify food systems and improve climate resilience. However, participants emphasised the need for sustained support, particularly in market development and youth inclusion, to fully realise these opportunities.

5. Discussion

5.1. Local Findings in Relation to Global and National Small Grain Trends

The local resurgence of small grains in Norton Rural District resonates strongly with global and national trends emphasising the renewed importance of traditional cereals. Across regions, such as Ethiopia, the Sahel, and parts of South Asia, crops like millet, sorghum, and teff have gained traction for their adaptability to climate stresses and their nutritional benefits (Gebrelibanos & Melesse 2020; Midega et al., 2021). This alignment indicates shared agronomic and socio-cultural responses to environmental uncertainty and food insecurity. Zimbabwe's national context reflects a gradual shift away from maize monoculture toward embracing small grains, a response to the country's increasing climatic volatility (Manyeruke et al., 2022). However, this shift remains constrained by structural legacies embedded in agricultural policy that have historically prioritised maize production over indigenous cereals (Mashingaidze et al., 2021). The local case thus exemplifies how farmers negotiate the tensions between entrenched food systems and emerging ecological realities, highlighting the agency of rural households in navigating policy and environmental change.

Theoretically, these observations underscore the necessity of adopting food system frameworks that

acknowledge the interplay between historical path dependencies, cultural values, and environmental adaptation (Creswell & Poth, 2018). Small grains' revival reflects a critical re-embedding of foodways within local ecosystems and knowledge systems, challenging dominant development paradigms that often marginalise indigenous crops.

5.2. Small Grains' Role in Food Security, Ecological Sustainability, and Cultural Continuity

The contribution of small grains to diversified food security extends beyond their caloric value to encompass nutritional adequacy and resilience. The local practice of integrating millet, rapoko, and sorghum into traditional diets enhances dietary diversity, micronutrient intake, and fibre consumption, key components in addressing hidden hunger and malnutrition (Kebede et al. 2019). This supports broader nutrition-sensitive food security models which assert that food systems must deliver not only calories but also health-promoting nutrients (Burchi et al., 2018). Moreover, the inherent drought tolerance of small grains ensures more stable production under erratic rainfall patterns, thus providing a buffer against crop failure.

From an ecological perspective, small grains contribute positively to soil health and agro-biodiversity conservation, central tenets of conservation agriculture (Baudron et al., 2021). The observed traditional cropping methods, including intercropping and seed sharing, maintain genetic diversity and ecosystem services, strengthening agroecosystem resilience. This aligns with agroecology theory, which views farming as an ecological process that integrates social and biophysical components (Altieri et al. 2020; Wezel et al. 2009). The cultural dimension is equally significant: small grains serve as conduits for indigenous knowledge, oral traditions, and identity formation. Elders' stewardship of seed varieties and drought coping wisdom exemplifies the transmission of cultural memory, thereby embedding agricultural practices within communal heritage (Matondi et al., 2021). These findings emphasize the inseparability of ecological sustainability and cultural retention in small grain systems.

5.3. Contradictions in Policy Frameworks and Social Perceptions

Despite their evident advantages, small grains remain marginalised within Zimbabwe's agricultural policies and broader food narratives. Government extension programmes continue to favour maize, resulting in limited technical support, subsidies, and market incentives for small grains (Mutambara et al., 2021). This institutional neglect contrasts starkly with the grassroots reliance on indigenous cereals as climate adaptation strategies (Jiri et al., 2020). Such contradictions highlight the political economy of food systems, where entrenched interests and historical trajectories impede equitable resource allocation.

Socially, perceptions among youth that small grains are outdated or associated with poverty threaten the sustainability of knowledge transmission and crop cultivation. This stigma reflects the cultural politics of modernity, where westernised ideals often devalue indigenous practices despite their practical and nutritional merits (Matondi et al., 2020). The disconnect between policy neglect and societal attitudes reveals an urgent need for integrative approaches that recognise both the material and symbolic dimensions of food crops.

Theoretically, these tensions illustrate the limits of technocratic agricultural models that separate ecological resilience from social justice and cultural relevance. Integrative frameworks, such as agroecology and food sovereignty, explicitly challenge these divides by foregrounding farmer knowledge, cultural identity, and equitable access (Pimbert et al., 2021).

5.4. Ubuntu Values and Gendered Knowledge in Small Grain Cultivation

Ubuntu philosophy, with its core principles of sharing, mutual dependence, and communal wellbeing, deeply informs gendered knowledge systems surrounding small grains. Women's pivotal role in seed saving, food preparation, and intra-community seed exchange reflects a relational knowledge economy grounded in Ubuntu ethics (Patel, 2012). This communal approach reinforces social cohesion and food security through collective resource management and reciprocity. Elder women act as custodians of agricultural wisdom, ensuring continuity through intergenerational teaching, which embeds small grain cultivation within cultural and social networks.

This gendered dimension counters reductionist agricultural narratives that privilege individual productivity over community-based knowledge systems. It reveals how sustainable food systems are not solely biophysical but are embedded in social relations and cultural values. Ubuntu thus provides a theoretical lens to understand agricultural knowledge as a living, shared practice that sustains both human and ecological communities (Pimbert et al., 2021).

5.5. Small Grains through the Lens of Agroecology and Food Sovereignty

The small grain systems documented in this community vividly demonstrate agroecological principles in practice. Agroecology's emphasis on biodiversity, ecological processes, and co-production of knowledge finds expression in traditional planting techniques, seed diversity maintenance, and organic soil management (Altieri et al., 2020; Rosset and Altieri, 2017). This approach contrasts with industrial monoculture paradigms by fostering resilience and adaptive capacity at the local level.

Food sovereignty frameworks further complement agroecology by advocating for local control over seeds, food systems, and cultural foodways, emphasising equity and justice (Patel 2012). The community's engagement with seed saving, informal markets, and local value chains asserts autonomy in a context dominated by industrial food regimes. These practices illustrate how small grains become vehicles for political and economic empowerment, reinforcing social and environmental rights simultaneously (Muzamhindo et al., 2023).

Together, agroecology and food sovereignty challenge dominant food system logics by linking ecological sustainability with democratic governance and cultural dignity. The local findings embody these intertwined principles, suggesting that small grains offer pathways to environmental adaptation and transformative food system change.

6. Conclusion and Recommendations

Small grain production emerges as a critical strategy for enhancing food diversity, ecological resilience, and cultural identity in rural Zimbabwean contexts, such as Norton Rural District. These indigenous cereals, including millet, sorghum, and rapoko, contribute to dietary diversification and improved nutrition and more sustainable agricultural ecosystems due to their drought tolerance and low input requirements. Beyond their agronomic benefits, small grains are vital cultural symbols, preserving indigenous knowledge, oral traditions, and community identity amid changing socio-economic conditions. Women play a central role in sustaining this knowledge system through seed saving, preparation, and intergenerational transmission, often navigating multiple constraints despite systemic neglect by agricultural policies and extension services. Their contributions underscore the gendered dimensions of small grain production and the significance of inclusive approaches to food security. The findings underscore the urgent need for supportive policy frameworks, infrastructural investments, and public awareness initiatives to fully realise the potential of small grains. Without concerted attention to these areas, the resilience and cultural heritage embodied in these crops risk being undermined, threatening the sustainability of rural livelihoods. Small grains provide viable pathways for addressing climate change impacts, food insecurity, and cultural erosion in Zimbabwe and beyond, provided that institutional and societal recognition is aligned with local realities and knowledge systems.

To advance the revitalisation and sustainable development of small grain production, agricultural policies must explicitly integrate these crops into subsidy programmes and national food security strategies. Recognising small grains as strategic staples would provide farmers with the targeted financial incentives and expanded market opportunities to invest in their cultivation. Equally critical is the strengthening of extension services through specialised training of agricultural officers in small grain agronomy, pest management, and post-harvest processing technologies. This will ensure that farmers receive contextually relevant technical assistance that acknowledges indigenous practices and mitigates common challenges, such as storage losses. Given the pivotal role women play in the stewardship of small grains, targeted gender inclusion measures are essential. Women farmers and processors should be empowered through access to resources, such as quality seed, credit facilities, and training programmes that enhance their capacities in sustainable production and value addition. Addressing negative stereotypes surrounding traditional grains requires comprehensive awareness campaigns that engage communities, schools, and media outlets to reshape perceptions and promote the nutritional and cultural value of these crops. Such initiatives can help reverse the decline in youth participation and foster pride in indigenous food systems. Furthermore, investment in community-level infrastructure, including improved storage facilities, affordable grinding mills, and accessible marketing channels, is critical to reducing post-harvest losses and enhancing the marketability of small grains. This infrastructure will support farmers in preserving quality and extending shelf life and enable participation in emerging value chains. By adopting these multi-faceted interventions, policymakers and stakeholders can create an enabling environment that realises the full potential of small grains as drivers of food security, ecological sustainability, and cultural resilience.

Declaration of Competing Interest

The author declares that they have no financial or non-financial competing interests.

Author's Contributions

R. Zhakata (0009-0008-5336-2159): *The author solely carried out all stages of the research, including conceptualization, methodology design, data collection (qualitative interviews), data analysis, manuscript writing, and editing.*

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