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Colonization and the Decline of Indigenous Systems, A Case Study of Finger Millet in Chikukwa, Zimbabwe

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Abstract

Indigenous food systems play a critical role as we battle with global climate change. These still exiting smallholder farmers sustain much or the world biodiversity and ancient land-based wisdom. Although these food systems have stood the test of time, there is little research on what caused their demise as well as what held them together before they were dismantled. This research sought to capture the indigenous agroecological wisdom that still exist and the understanding of the loss surrounding finger millet of the Shona people by conducting a participatory case study on the Chikukwa community in the Eastern Highlands of Zimbabwe. This research showed that practices surrounding finger millet played a key role in the social cohesion, food security, physical wellbeing, and spirituality that enabled resiliency that held this community together before the introduction of colonization and Christianity, which alongside Zimbabwe's new country politics and intergeneration dynamic were key causes to the demise of finger millet. Concluding that the role of indigenous food systems was much more than agricultural but play a vital role in the overall cultural. Therefore, as the western world continues to operate in the space of development it is vital that we understand the full biocultural and historical context of these communities.

Keywords: Finger millet, indigenous agriculture practices, colonization, ritual, social cohesion

List of Tables and diagrams

1. Introduction

Never have we been in such a crucial time to revise our agricultural practices to participate in a better relationship with our natural world. We are facing grave and irreversible effects as a part of global climate crisis, such as loss of biodiversity, increased carbon dioxide in the atmosphere, decreased soil organic carbon contents, droughts, and famines (Berry et al. 2015; Steiner et al. 2020). Agriculture contributes to major disruptions of the natural world and is arguably the most vulnerable sector in the face of erratic weather patterns (Abbass et al. 2022). To work towards an agricultural transformation is a perfect place to begin to move towards a more ecologically minded global community.

Modern industrial agricultural methods and the Green Revolution contributed to the creation of a global agricultural business that monetarizes control over the ecosystem. Industrial agriculture can be an extractive model, part of a system of domination that uses chemical inputs, high yielding crop varieties, and machinery to produce food. This dominating model of agriculture is deeply rooted in the western, colonial mindset: the idea of man being placed outside of and above nature (Pfrimer et al. 2017; Decena 2014; Adams and Mulligan 2003; Waldmueller 2015).

This worldview – a cosmology with human beings at its center - has led to the disconnection between nature and humans; This shaped a relationship of control and dominance of the natural world, abandoning a symbiotic relationship of balance within? our ecosystem. This system of forced extraction has failed in the promise of feeding the human population (Patel 2013; De Gregori 2004): the Green Revolution was conducted under the promise of a world without famine; yet, despite living in an age where more land is under intensive agriculture to produce food, widespread malnutrition and starvation still continues to be a major challenge around the globe (Adams and Mulligan 2003; Pfrimer et al. 2017; Gómez et al. 2013).

Reconnecting with the natural world and traditional agricultural practices that are in balance with our ecosystem are key to counteract the influences of climate change on food security (Matties 2016; Hanspach et al. 2020; Steiner et al. 2020; Kuhnlein and Chotiboriboon 2022; Vijayan et al.

2022). Paradoxically, the threats of climate change are the perfect catalyst to revisit extractive agricultural approaches and integrate a balanced cosmovision.

There exist indigenous communities that still carry traditional agricultural wisdom in their practices of kinship with the land, despite the intentional colonial dismantling of their traditional agricultural and cultural practices that forced them to go underground or disappear (Wright 2021a). Although research on climate change and agriculture is still largely dominated by anthropocentric narratives that sees nature as an exploitable resource (Moreno Cely et al. 2021; Swiderska et al. 2022), regenerative scholarship in the Global North has slowly started to recognize the value of indigenous ecological knowledge (Shava et al. 2009; Pimbert 2018). This emerging body of research and action has been focusing on indigenous traditions as ways to mitigate global climate change through climate smart agriculture practices (Altieri et al. 2015; Hanspach et al. 2020).

As localized responses to climate change, there has been a revival of traditional crops through the incorporation of indigenous practices in the national food production strategies (Department of Crop Scienc, Federal University Dutse, P.M.B.7156, Jigawa State – Nigeria. and Sambo 2014). Famous examples include the movement in India for the revival of traditional agricultural practice to grow millet (Gupta et al. 2017; Pradhan, Panda, and Bhavani 2019; Suri n.d.) and the movement in Peru among Quechua communities to grow local varietals of potatoes by reviving traditional agricultural (Swiderska et al. 2022; "You Can't Grow Potatoes in the Sky: Building Resilience in the Face of Climate Change in the Potato Park of Cuzco, Peru - Sayre - 2017 - Culture, Agriculture, Food and Environment - Wiley Online Library" n.d.).

Yet, while movements for the revival of indigenous agricultural practices are on the rise in South America and South Asia, the same revival does not seem to be taking place on a large scale in the African continent (Shava et al. 2009; Gukurume 2013; "Harnessing Zimbabwe's Indigenous Knowledge for a Changing Climate" 2021). The "African revival" is lagging partly because of the exceptional and unmatched colonial disappearance of African traditions. On the continent, Euro-Western economic, political and religious reforms have mostly replaced traditional ones, resulting in some of the deepest agricultural transformations witnessed across former colonial states (F.G.H. Lupton 1996; Vijayan et al. 2022). This caused a widespread loss of African traditions and land-

based wisdoms that were key for social cohesion and spiritual well-being. In places where agricultural practices were socially held and inextricably linked to spiritual ones, cancellation of the one resulted in destruction of the other (Nyoni 2017; Chigudu 2021). In southern Africa, for instance, Shava and colleagues found that traditional grains and religions have been replaced by hybrid maize and Christianity: the agricultural transformation, they argue, could not have happened without the spiritual one (Shava et al. 2009). The colonial disruption of the African traditional agricultural system over time has compromised the food security of local populations across the continent. In the example mentioned above of southern Africa, the local population began growing hybrid maize to pay taxes imposed by the colonial government in a major shift from an agriculture of subsistence to a market-based one (Bjornlund, Bjornlund, and van Rooyen 2022; Page and Page 1991). This pattern of exploitation still continues today in the key agricultural policies created and implemented by several national African governments (Mkandawire and Aguda 2009).

In Zimbabwe, a southern African country that famously experienced dramatic and long-lasting harmful consequences of colonialism, the government is still actively promoting hybrid maize and industrial agricultural practices decades after independence, despite evidence that both hybrid maize and industrial practices are threatening national food security (Byerlee and Heisey 1996; McAllister and Wright 2019; Rurinda et al. 2015; Shava et al. 2009). For example, the minister of agriculture recently projected a 43% decrease in maize production where he cited erratic weather patterns spawned from global climate change as the major cause (XINHUA 2022). In the country, the destruction of pre-colonial agricultural methods has not only led to the erasure of local grains and as mentioned above, spiritual beliefs; it has also profoundly disrupted the social fabric of local populations who, through those agricultural practices, maintained social cohesion (Nyoni 2017; Tavuyanago, Mutami, and Mbenene, n.d.). Yet, despite the ongoing pressure that indigenous Zimbabwean populations face, some are still defying cultural erasure by keeping alive traditional agricultural methods to face the problems of food insecurity. An example of this is seen in a community in the Mangew District in Zimbabwe who initiated a successful traditional agriculture revival as a strategy to food shortages

Another such pocket exists in the community of Chikukwa in the Eastern Highlands, where some of the local Shona populations are striving to keep alive cultural and agricultural practices based on a cosmovision where humans, nature, and spirit are inextricably interlinked (Muzerengi and Tirivangasi 2019). The maintenance of these traditional Shona practices and worldviews are, however, continuously under the influence of a market-based agricultural system that threatens the survival of local plants, and the spiritual and social practices associated with them (Muza 2019). The Shona populations upholding these traditional practices themselves are aware of the threat posed to the survival of their culture, especially in terms of agriculture. The increase in droughts and erratic weather patterns has further increased their desire to preserve traditions that have allowed them to be resilient through similar challenges before. The interests of the Shona populations of Chikukwa matches a call in the literature to study the resilience of indigenous agricultural systems, developed over thousands of years (including their spiritual connection to the land) and their recent dramatic disappearance (Vijayan et al. 2022; Wright 2021b).

My research responds to both this call in the literature and the documented interest of the Shona population by investigating how social and spiritual traditions and rituals related to the Shona indigenous agricultural practices contributed to their connecting as a community. As such, this study has both an archival intent by documenting the causes of the disappearance and the benefits of a culturally important plant, to counteract the loss of the story, culture, rituals, and techniques that make these land-based cultures resilient, as well as a practice- and policy-oriented goal, aiming to identify critical learnings for agroecological praxis in Zimbabwe and, more generally, the African continent (Muza 2019; Wright 2021b). In the design of this research, as discussed later in further detail, I partnered with Shona community co-researchers to identify a plant that was spiritually, agriculturally, and medicinally sacred to them, responding to their desire to preserve the knowledge associated with it. In tracing the history of their relationship with finger millet I studied how a plant that once had great community importance was now disappearing in ways that affected the agricultural, social, and spiritual traditions of the community. Finger millet is not only a plant of high social importance in Chikukwa, but it is also very valuable as a drought resistant plant with dense nutrition (Pradhan, Panda, and Bhavani 2019; Gupta et al. 2017; Chandra et al. 2016; Shava et al. 2009).

In this study, I was aiming to understand the effect of the disappearance of a traditional plant (in this case, finger millet) on the resiliency of the indigenous community living in Chikukwa. To this purpose I sought an answer to the following four questions: 1) What are the benefits of finger millet that contributed to its prolonged use in this community? 3) What threatened its cultivation and later potentially caused the loss of its cultivation? 4) What consequences has the people in Chikukwa faced because of that loss? And 5) What solutions do they envision for its revival? By studying the case of this Chikukwa community we have gained insights that may contribute to the body of knowledge on the importance to preserve and revive indigenous plants to counteract the local and global effects of colonialism and industrial agriculture. This research seeks to understand the phenomena around the decline in use and production of traditional, sacred agricultural plants and traditional cultural practices associated with those plants. How has this decline affected the community and what role does the loss of this particular, traditional, ecological knowledge play in overall resiliency of the Chikukwa community.

I offer the findings included in this work first to the members of the Chikukwa community themselves, wishing they might preserve their relationship with finger millet in the many years to come, as well as to practitioners and policymakers willing to implement decolonial agricultural praxis that has the potential to contribute to a safer, more just and food diverse world.
In the next section, I provide information on the methods I used to collect and analyze the data, then I present findings that can help me answer my research questions. In the third section I discuss these findings and contextualize them in the recent decolonial literature on indigenous agriculture revival in Africa. In the last section I summarize and conclude this work.

2. Methodology

2.1 A Qualitative Approach

Qualitative methods are best suited when exploring the collective understandings that groups of people attach to specific cultural (and agricultural) practices; for instance, the understandings that a relatively secluded indigenous group assign to a culturally important plant growing in their area (Hammarberg, Kirkman, and de Lacey 2016). Qualitative methods allow researchers and participants to engage in in-depth explorative conversations on themes of investigative relevance (Blandford 2013). In this research, I used a qualitative approach with semi-structured data

collection methods. They offered the most appropriate toolset to answer questions related to the lived experiences and shared perspectives of the people of Chikukwa, specifically related to their agricultural, spiritual, and cultural practices related to finger millet (Hammarberg, Kirkman, and de Lacey 2016).

2.1.1 Case Study Design

I used a case study approach to investigate the experiences of people living in Chikukwa related to their indigenous agricultural practices and a potential loss of traditional culture. I was interested in conducting an in-depth investigation within the "real-world context" of the Chikukwa, and of how the people living in the area were interfacing with the local, national, and international context in the conservation (and potential loss) of their agricultural practices (particularly related to the plant(s) they deemed to be central to their physical cultural, social, and spiritual survival) (Yin 2018).

2.2 Agroecological principles and Participatory Action Research

Agroecology has developed over the decades, and the idea of integrating local knowledge with western scientific knowledge has become a prominent principle in the field (Mendez 2012; Figueroa-Helland, Thomas, and Aguilera 2018). This intersection allows for a perfect setting to implement the methodology of participatory action research (PAR). Participatory action research uses design tools to collaborate with local communities to understand where the needs of both the community and the researchers can be met (Mendez 2012; Figueroa-Helland, Thomas, and Aguilera 2018). Research can be one way of maintaining the status quo of an extractive and colonial academic system (Heleta 2016). Since this research aimed to contribute to a rebalancing of the power dynamics that exists between researcher and the participants, I decided to implement some PAR tools to create a collaborative process of mutual learning and collective inquiry (Chevalier and Buckles, n.d.; Méndez et al. 2017). To use PAR approaches, I collaborated with people living in Chikukwa to design a research project that addressed their worries related to the loss of their local traditional agricultural knowledge.

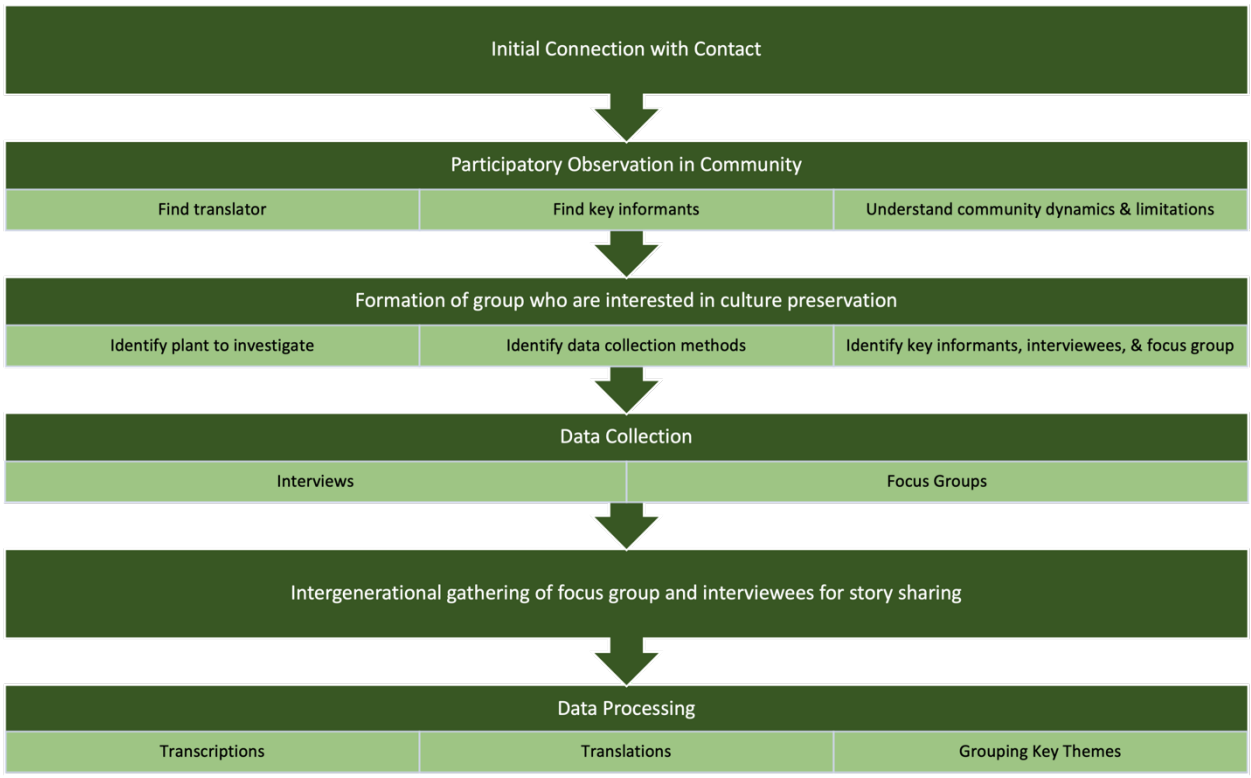
Specifically, in preparation for the study I undertook the following actions: 1. Conducted an exploratory phone call with a community leader who invited me to come to Chikukwa to understand the context of the community 2. Conducted an informal group discussion and plant knowledge workshop with key informants, that I located with my guide after two weeks of participatory observation in the village, to understand the needs and perceived cultural loss of the community. 3. Co-designed tools with these key informants to use for data collection 4. Co-created the content of semi-structured interview guides with the same key informants, and 5. shared results with the focus group participants and discussed possible ways for intergenerational knowledge sharing as there seemed to be a point of triangulation for knowledge sharing. The co-design workshop was the most crucial step in preparing aims and methods. There, participants identified the main areas of knowledge they wanted to protect and revive. The priority of the co-designing group was to archive the traditional knowledge related to finger millet, specifically knowledge related to local, indigenous, ecological knowledge, the agri-food system, and spiritual practices, as well as the problems with intergenerational transfer of that knowledge. Despite the intention to implement a full PAR approach (Mendez 2012), the use of PAR in this research was limited due to the nature and scope of a master's thesis research, and I therefore focused mostly on the design phase.

2.3 Participants and Data Collection Methods

This research took place in the community of Chikukwa which is located within the Chimanimani district in the eastern highlands in Manicaland Province of Zimbabwe. This community, which consists of around 5,000 people, identifies as a tribe of Shona peoples and Shona (Ndau) is the main language spoken. To understand and gather information on the traditional knowledge surrounding finger millet, and the barrier to intergenerational transfer of knowledge, participants in this research included 1) people living in Chikukwa, 2) from different generations, and 3) having distinct roles in the community. Having to make critical choices on participants' gender, due to the limited resources available for this self-funded research, I sought co-designers' advice on who to include as research participants. Co-designers alerted me to the fact that, in Shona culture, women are the keepers of knowledge related to indigenous plant and medicines. They also pointed, however, to the importance of including men with specific plant-related roles, such as traditional healers. To collect data with women and traditional healers in the co-design workshop we chose

three data collection methods: 1. Observation, 2. Focus Group Discussions which included a visioning session for the future, and 3. Semi-structured interviews. Table 1 breaks down the process.

Table 1: Process of data collection methods and Processing



2.3.1 Participant Observation

I lived in the community and conducted participant observation for approximately three months (Baker 2006). During this time, I was hosted by a family who was extremely active in the community. In these three months I participated fully in the day-to-day tasks for the household as well as went to local community events. I was also invited to participate in ceremonial spaces which included rituals around agricultural activities. At each event I took detailed notes that I recorded in my log and every night I recorded detailed notes from my observations and the conversations of that day.

2.3.2 Focus Group Discussion

To understand the intergenerational dynamics of knowledge sharing in the community, I also conducted focus group discussions with nine women three different times. They are smallholder farmers and mothers aged between 20 and 40 years old (Kitzinger 1995). There are two main reasons for inviting the same nine women to three discussions, as opposed to collecting data

through multiple one-time focus groups with diverse groups of women. The first reason is that these women are the core part of a revival movement of indigenous traditions in the community, hence guaranteeing key information and aspirations that were critical to attain research aims. The second is that multiple conversations would offer the possibility to achieve, over time, greater trust, and touch sacred aspects that–co-creators said– would only be shared after having gained participants' trust in ways that a single focus group would not offer.

Following co-designers' recommendations I interviewed older women individually, as these women would not have been comfortable speaking in a group.

Each focus group discussion began with a prayer ritual, traditional songs, and dances to encourage a place of security and non-judgement. They were conducted in Shona language with the help of a live interpreter and recorded for future translation. See Appendix A for detailed information on participants' occupation, sex, and age. Their real names have been changed.

2.3.3 Semi-structured Interviews

Because I was collecting data on largely unknown practices, semi-structured interviewed seemed the most appropriate data collection tools with individual participants (Blandford 2013). Interview participants were chosen in collaboration with the co-creation group: we decided on 9 women and 5 men in the community, viewed as experts or knowledge keepers around finger millet and their rituals. All these interviewees, besides one, are above 60 years of age. They are all known in the community to grow or have grown finger millet and use traditional practices. In addition to 9 older women (interviewed for the reasons mentioned above) the group of participants included four men: a traditional healer and three activists for the revival of sacred Shona knowledge. The interviews lasted for approximately an hour each. They were conducted in Shona language with the help of a live interpreter and recorded for future translation. See Appendix A for details on the interviewees.

2.4 Data Analysis Procedures

Following standard procedures for qualitative data analysis (Hammarberg, Kirkman, and de Lacey 2016), I began by preparing and organizing my data from the semi-structured interviews and focus groups, as well as gathering all my observational notes from the field. All data that was obtained through focus group- and semi-structured interviews conducted in Shona has been transcribed and translated into English by an external interpreter who crossed checked the live translation done by my field interpreter.

I broke the data into broad categories that were relevant to my research questions. Afterwards, I coded the transcripts. I did this by breaking the raw text into topics or codes that were meaningful and related to the research questions. Then, I aggregated these codes into themes. I looked at these themes and chose certain themes that were relevant for the research questions and dropped themes that were not relevant, for example recipes using finger millet. Afterwards I looked at the patterns within the chosen themes to compare within the relative themes, while doing this I remained alert on what could explain the similarities or the differences. I chose to present my themes by putting them into sections related to each research question. To keep my data clear and concise I used the software NVivo for this process. An example of my raw data is in appendix C.

2.5 Ethics

I informed the participants about my research and how I was going to use the data collected during this research. Informed consent was obtained verbally after reading the consent document created for this research. This research has used pseudonyms to protect the identity of all participants. All recordings and data have been safely stored in a password protected area to ensure confidentiality and data security for the participants. This was clearly communicated to all participants while I was in the field. Consent was also obtained to use this information to record knowledge about their specific community for preservation and education.

3. Results

3.1 The Cosmovision Chikukwa - A Spiritual Nexus

Participants volunteered critical information that helps contextualize the Shona people of the Chikukwa and their unique cosmovision that weaves through multiple aspects of their lives in a spiritual nexus connecting people, nature, spirit and, most importantly, ancestors.

3.1.1 Rituals & Ancestral Communication

Ancestral communication, appeasement, and thanksgiving, specifically, is a crucial cultural aspect of Shona's practices and an essential building block for community. Participants offered that it dictates many aspects of their lives, especially agriculture, health, and social cohesion. For this paper, we specifically talk about their strong connection with finger millet because of its cultural importance and perceived disappearance. Ruwadzano, for instance, remarked: "Without finger millet, there is no relationship with the ancestors."

The importance of communicating with ancestors was mentioned across all interviews. A few participants said that for that purpose they would "keep alters for our ancestors" often "in the kitchen, because that way we can spend the most time with our ancestors" (Anokosha). The ancestors, who also communicate through illness, disease, rainfall, and other significant events, need to be appeased constantly: "If the ancestors say they want beer (through manifestations of illness or droughts) I simply oblige and prepare it, then offer it to them to make things better," Ropafadzowas.

3.1.2 Finger Millet and Ancestors

Among the many ways participants communicated with ancestors, brewing finger millet beer occupied a privileged place: "There is a strong link between finger millet and many ancestral rites here" (Aizivaishe). Every single participant across generations reported rituals for brewing finger millet beer as a way of talking to their ancestors. Shohiwas, for instance, said: "The act of brewing and doing rituals is actually talking to them [ancestors];" and Zendaya, echoed: "Finger millet has a strong link with the ancestors…We have been brewing with finger millet for our ancestors from beginning of time." Asked why they used finger millet; they said it was the ancestors' way: "Our ancestors have always used finger millet for rituals and ceremonies" (Anodiwa). The importance of finger millet was so critical that participants made overwhelming reference to a legend of finger millet being given by the ancestors. Miriro, for instance, said:

> Our elders used to tell of a story where their ancestors…would wander in the bush during a famine searching for food. At that time, they made sadza [porridge] from a tree called "mutendeni." But [at that time the tree] was not available, because it was during a famine. So, they stumbled upon an unusual looking grass plant [finger millet]. So, they took it back home and nursed it. Soon it became a staple because immediately the seed was shared throughout the community. It is a special crop because finding it was no mere coincidence, but it was led by the ancestors.

The connection that participants made between finger millet, beer brewing and ancestors provides a critical insight into the socio-cultural context, necessary to understand the social, agricultural and health benefits of the plant in Chikukwa, presented in the next section.

3.2 Benefits of Finger Millet

This section answers the second research question, seeking to understand the benefits of finger millet that contributed to the survival for this community. Participants discussed three main reasons why finger millet was important to their community: the plant 1) contributed to social cohesion, 2) was agriculturally resilient, and 3) was a reliable and rich food source, and 4) its medicinal purposes.

3.2.1 Finger Millet Rituals and Social Cohesion

All participants remarked extensively on how, through finger millet-related rituals, their community as whole would come together to celebrate. Shohiwa remarked, for instance, said it would be impossible to "do any rituals, personal or community-wide, like rain ceremonies or speaking to the ancestors without finger millet brew or sadza." Similarly, Ruwadzano described the need for finger millet for community ritual gathering: "If we do not have finger millet, we cannot do our rituals that bring our community together."

Multiple rituals that gathered the community using finger millet were mentioned by all the participants. An important one for women was the ritualistic brewing of beer, mentioned above, done either at family level or for the entire community.

Beer could traditionally only be brewed by women who are post menopause said Aizivaishe: "women who take part in these rituals are supposed to be strictly post-menopausal and not sexually active during the brewing," so that they would not be distracted by the "impurity" of sexual desire. For the same reason, women who brewed beer had to "abstains from sex and be pure for the spirits" (Ruwadzano). Women who had not reached menopause could still support the brewing, for instance by "making food, getting firewood" (Anokosha). Participants remarked that, because beer takes several days to brew (most participants said seven), the ritual offered women a socially acceptable reason to gather for an extended period. Brewing of beer in the family were important opportunities for women to socialize in a gender homogenous space: "if you need to brew beer in your family you call relatives to help you and that's where you chat about everything, it's safe" (Danai).

Conversely, when the brewing was a ritual performed at community-level, some men (mostly elders and traditional leaders) did enter the sacred brewing space to perform secret ceremonies that were never disclosed to me, presumably given their profound sacredness. While the traditional leaders and the women engaged in the sacred brewing, the remaining of the community (and at times, as Aizivaishe's quote below suggest, even people from different villages) would engage in a non-sacred space to engage in other, more public, ritual brewing and feasting:

> They would appease ancestors by preparing pounded finger millet served with traditional chicken set at a secret place in the sacred forest or caves where no one lived. The villagers would also enjoy the same [food] at a central place where the celebrations took place. The traditional beer, prepared by setting the finger millet in water for seven days, was served on the next day at rainmaking, thanksgiving, or harvest ceremonies.

In addition to brewing beer, the people of Chikukwa had rituals to prepare planting and harvesting that would "bring our community together" (Anesu), but that were dependent on the presence of finger millet: "we need the finger millet to preform them" continued Anesu. These rituals were important "galas or conventions … to enlist the help of other villages to either plough, weed or harvest our land" (Tonderayi). Such rituals took place at every stage of the agricultural process, from plantation to harvesting. Aizivaishe mentioned a ritual conducted at the beginning of the process where: "the chief … would instruct us to prepare finger millet porridge and put it on barks of trees, any tree, and set the barks at every corner of the field for blessing and protection of the field from pests or natural disasters." And after the harvesting, Ruwadzano said: "we used to cook finger millet porridge … and pour the porridge on the corners of the fields to ward off pests and diseases. We would do this in community because we all helped each other harvest and plant.... We would also pour some in the water source so that it would not dry up".

3.2.3 Finger millet and Agricultural Resilience

Finger millet had a plethora of agricultural benefits (due to the biophysical aspects of the plant) that many participants listed, showing a depth of well-informed traditional ecological knowledge. The main four were: 1) the long-term viability of finger millet seeds, 2) the little amount of seeds necessary for replanting it, 3) its drought-resistant qualities, and 4) finger millets by product use preservation of other seeds.

Some participants were very specific about storage times and uses after the seeds are no longer viable for planting: “Finger millet can be stored up to twenty years for food and as medicine, however, it can only be used as seed before the expiry of about seven years” said for instance Aizivaishe. Other participants, such as Ropafadzo, mentioned the ease of storage of the seed: “We would just pluck the heads from the stalks and put them in big traditional pots with no preservatives. If you wanted to … cook it, you just take it and use it”. Participants were aware that the seeds viability made it easier to keep seed for the next planting season lending itself to seed sovereignty for the community: Anodiwa for instance said: “It is more beneficial to return to our ways because you’d use the same harvest as seed for the next planting season.”

Participants also mentioned a second benefit of the plant: the small amount of seeds necessary to produce a large amount of food, which in turn ensured food security in the community: “All you would need is a little seed for planting the fields,” said for instance Tonderayi; and similarly Zendaya remarked: “You can plant a whole field with just a cupful of seed, without fertilizer. To do that with maize you would need at least 10 kgs and all the fertilizer”. Some participants mentioned using fertilizers, in contradiction to what Zendaya and others said, but always using natural inputs, such as “Cow dung and leaves” (Aizivaishe) or “the leaves [from the fig tree] and over ripe figs” (Anochengeta).

Participants mentioned a third benefit: drought resistance. Because finger millet was planted well before the rainy season “when the first rains fall, the finger millet seed is already in the ground. [Now the rainy season comes late] … but unlike the maize the finger millet is okay.” (Anesu). And similarly, We always know the finger millet will be okay, even today now that the rains are late, I plant finger millet because I can count on having a harvest. It has aways been secure” (Kuntenda). Finally, participants remarked how the husk of finger millet could be used as a seed coat for seed storage, to the point that participants would: “Take the husks and mix it together with seeds … to preserve – that will keep the bugs out” (Anochengeta). When processing finger millet, they “would save the husks and mix it with other seed” (Tonderayi) for storage purposes.

3.2.4 Finger Millet's Nutritional Value

The resiliency of finger millet played a main role in granting food security to the community, both as a part of a normal diet but especially during drought and famine: "During drought periods you can cook just a small amount of finger millet meal and the whole family will survive" said, for instance Zendaya.

Anodiwa commented made a link to the seed property: "Since our seed [finger millet] is denser [than maize], you use less to prepare meals." Most participants compared eating finger millet to eating maize, all praising the former: Miriro, for instance, said: "Finger millet meal differs greatly from maize meal…you are full for longer" and Zendaya echoed, "when preparing porridge or sadza, you don't use a lot of finger millet unlike maize."

In their comparison, participants also remarked that finger millet was "very nutritious" (Ruwadzano), so that when people ate it, they "would rarely get sick or weak" (Aizivaishe) and to the point that it would be the preferred food for "babies who would have just been weaned" (Miriro). Zendaya jokingly remarked that if others will leave some finger millet porridge over: "I will eat it by myself and be strong;" and her grandson similarly knew that eating finger millet would "Make you feel strong, you don't feel weak or tired, you don't feel well with this new type of food." Several participants touched on finger millet's benefits for physical and brain development. Anochengeta made a case for the unnatural development of girls in the community as due to "the unnatural foods …that make kids at 12 years of age appear to have grown and want to marry yet the brains are still immature. Because of the natural diet we knew that girls would first develop breasts only at sixteen".

3.2.5 Finger Millet as medicine

Finger millet could be used as a traditional healing plant; said, for instance, Zendaya: "We have a strong relationship with finger millet. Why? Because of the medicine. It is medicine." Finger millet and traditional healing "Always go hand in hand" (Miriro) and "Traditional medicine is mostly mixed with finger millet porridge to heal ailments and never with maize meal" (Anochengeta). Itai, a traditional healer, couldn't imagine his work as a healer "Without finger millet, so I have to find seed to grow it."

While most referred to finger millet being generally “good” and “important for health” some participants specifically provided evidence of the health conditions that can be treated. For instance, it could help with lack of appetite, “It helps greatly when a sick person is not eating. You make porridge out of it, and they start to recover immediately” (Miriro) as well in case of “Common sicknesses like stomach aches or diarrhea” (Itai). In these cases, finger millet can help “Running tummies in both adults and babies” (Ruwadzano); that is, if prepared correctly, by “Soaking the husks for a while and using the water to prepare porridge – it’s a bit sour, but it stops running tummies in babies and adults alike” (Anochengeta). One participant, Fadziso, knew a more drastic treatment to be used in extreme cases: “If someone is on their death bed you make a thin porridge and try and pour it in their anus.” Finally, finger millet also played a role in the more spiritual dimension of healing: “If someone is sick, you can put finger millet in a plate to temporarily appease the ancestors before brewing the finger millet brew”.

Participants provided overwhelming evidence of the benefits of finger millet for their social, spiritual, agricultural, and physical wellbeing. This being the case, I was interested in understanding the causes of decline of finger millet usage in the area – the second research question of this study, on which I report in the next section.

3.3 The Gradual Disappearance of Finger Millet Cultivation

Despite the many benefits of cultivating finger millet discussed, the fields surrounding the community were almost exclusively covered in maize. Participants unanimously lamented the gradual disappearance of finger millet, that once covered “vast fields” (Anochengeta) and was cultivated “on a large scale” (Anodiwa). Yet, at a certain point in time, the local populaton stopped “Growing it here as they used to traditionally” (Ruwadzano). What was the reason for this disappearance?

Across all the interviews, participants gave four reasons for the reduction in finger millet cultivation: 1) The colonial disruption of local traditional agriculture practices; 2) The erasing of traditional spiritual beliefs at the hands of Christian evangelism; 3) Invasive market-oriented government agricultural policies; and 4) Intergenerational community dynamics.

3.3.1 Colonial Disruption of Finger Millet Cultivation

All participants held British colonizers responsible for disrupting the local cultivation of finger millet. Some believed they did so by changing local food culture: “They mainly ate … a lot of canned foods, … and the locals would taste it and … started to like it. So, the locals were convinced that the white settlers’ food tasted better than their own, contributing to the demise of finger millet in the community” (Anodiwa). Others instead reported that colonial powers intentionally discouraged and even sanctioned the cultivation of finger millet: “During the times of the white settlers, they would burn down our grain stores of finger millet and huts, so the elders started to store reserve finger millets in the caves, and it would last for years ensuring traditional grains food security” said Anochengeta. And similarly, Miriro echoed: “getting rid of finger millet was a way of dispossessing us of our rituals, ceremonies, agriculture traditions and ultimately our culture because it works and connects us to our ancestors. The colonizers knew that without our ancestors we are exposed, and they could control us”.

Miriro was not the only participant connecting the destruction of finger millet to the intentional erasure of local cultural, spiritual, and medicinal practices. Anodiwa for instance told stories of when the colonizers “Brought maize and would want us to grow it instead of finger millet. …. So, most were discouraged and discontinued growing the finger millet but a few, … [who] they knew that we get our medicine and many other things from [it]”. Participants were measured in their assessment of the impact of colonization and mentioned that not all changes to the traditional agriculture system were negative. Some crops “Unlike the white maize, … have become almost native here and we have incorporated them in ceremony, like the red maize” (Kutenda).

3.3.2 Christianization and Loss of Traditional Spiritual Beliefs

Most participants referred to Christianization of the country as the biggest reason for the loss of their traditional spiritual beliefs and practices: “Those that are now Christians do not practice traditional ways because it is forbidden by the church” (Anodiwa). The loss of the traditional wyas also included rituals connecting with ancestors: “The branch of Christianity here is the Apostolic … which … forbids ancestral worship” (Anesu). The disappearance of traditional ancestral rituals, participants argued, decreased the demand for finger millet. .Ruwadzano said with concern: “Christianity has really dealt a blow into our traditions, including the use of finger millet,” and

Tete Betty echoed: “Many have converted and no longer see the need to practice traditional rituals and community practices.” Some participants mentioned a hidden system of practices to resist and counteract the effect of Christianity: they would be Christian in public but follow traditional beliefs at home: “I still do the rituals so that I get protection for my crops … despite being a Christian.” (Aizivaishe). Not without a certain degree of irony, Zendaya also revealed: “Even the leaders of the church now consult us secretly for these rituals.”

3.3.4 Zimbabwean National Agriculture Policies

Participants believed that the independent Zimbabwean government: “Brought [agricultural] modernization in the form of contract farming, which availed artificial fertilizers hence we concentrated more on growing maize” (Aizivaishe). To promote maize, “The new government gave us free maize seed.” (Zendaya). Anesu explained how “After independence people were given seed and fertilizer for free, and they quickly switched to growing maize hence forgetting about ancestors and finger millet rituals stopped.” The free distribution of seeds didn’t last long: Anodiwa recalls that “we were given about twice for free when the Agricultural Extension Officers came, but after that you had to buy seed and fertilizers because if you tried growing the hybrid seed without fertilizer, it would not germinate – the chemicals from the fertilizers had leached the soil. It became heavy on us because we did not have the finances to farm. But we needed money to pay for the new things”. The government's approach, she explained, created dependance on fertilizing chemicals and, in turn, would drag the community into a national capitalist agricultural system where money was necessary for food production.

One participant, Anodiwa, also added that the government policies not only disadvantaged the cultivation of finger millet, but they also aggressively restricted it: “Two to three years after independence … there were Agricultural Extension Officers from the new government who were strict in enforcing new hybrid seed and farming methods which did not allow mixing indigenous and their seed”.

3.3.5 Intergenerational Community Dynamics

Finally, participants mentioned a growing disinterest in traditional culture in their community. Ropafadzo, for instance, said she “Noticed that people here are no longer as serious about tradition

because many harvest without consulting the ancestors." Ruwadzano echoed, "No one will agree to growing finger millet. Maybe it only makes sense for us the elderly and royals who know that beer brewing and its rituals are indispensable."

More specifically, participants lamented disinterest in younger generations; Miriro, for instance was "disheartened" to "note that even these little kids do not know finger millet porridge. Those who know, do not want it." Similarly, Zendaya believe the "problem with the new generation" was that "they do not want to do the work. … it is so sad." Some participants said they would try to revive the plant, but with little results; among these, Ruwadzano: "Yes, I teach them but at times it is disappointing because the only time you see them do it is when you are teaching them. They do not carry it out themselves."

Surprisingly, despite the older generations pointing at disinterest and laziness in the younger ones, younger participants lamented the lack of opportunities to engage in traditional agricultural practices both physical practices such as intercropping with finger millet as well as the spiritual finger millet rituals of plant and land protection. Zendaya's grandson, for instance, said: "Most [youth] tend to see traditional ceremonies and culture as the preserve for the elderly. There is a lack of intergenerational gathering". And Aneni similarly said: "They do not want to share the information, but they are growing old, and they are going to die. What about tomorrow and out indigenous knowledge of our plants? We want our knowledge to be shared with the world. They are denying us information." Some younger women complained their mothers did not share traditional knowledge that they would have instead welcomed. For example, Anokosha said:

> We are listening to them but the way they are telling us, like myself-we are born a Christian and I don't know how to grow finger millet and I don't even know how to brew beer, so how come my mom would tell me that I should brew beer to my ancestors, but not teach me what it means…who are our ancestors, I was not taught…I know God….it is the system that we are existing in.

3.4 The Consequences of the Loss of Finger Millet

The third question guiding this research investigated the consequences of the loss of finger millet for the people in Chikukwa. Many participants frequently remarked on the current unavailability of finger millet in the community: "We have to go to Mozambique to buy the finger millet for all

that [planting and rituals]" (Anodiwa); "Those who would like to talk to the ancestors or brew beer … buy the finger millet outside of the community" (Anesu); and: "I am currently going back and forth to Mozambique because our elders here with agricultural and ritual knowledge of finger millet have died and/or no one knows here when I ask" (Kutenda). As for the specific consequences of the lack of finger millet, participants mentioned three of major relevance: 1) the disruption of indigenous agricultural practices leading to decline in physical and land health; and, more largely, 2) the disruption of their spiritual tradition, and 3) the weakening of social cohesion in their community.

Participants' indigenous agricultural practices were disappearing in ways that led to serious land degradation, unstable harvest and an increase of pest and diseases. Anesu, for instance, reflected on the recently changed conditions of the land: "People switched to maize because finger millet is labor intensive… but it is destroying our land … [Before] the land was rich enough from naturally occurring natural fertilizers and our way of planting. It was not damaged like today." Land degradation further worsened people's health and compromised their food security: "The fertilizers and insecticides that we use in the fields are compromising the land and our immune system," said for instance Miriro. And later, sharing deep knowledge of the nutritional value of finger millet, added: "Things have shifted greatly because back then the community would have finger millet in their diet and we would rarely be hungry, get sick or weak." Similarly, Anodiwa said: "It is sad that the decision [to not grow finger millet] helped many diseases [physical and environmental] to sprout … There were outbreaks of pests and diseases when people were forced to adopt the hybrid seed and new farming methods. Leading to a decline in food."

Finger millet is a key component in community traditional spiritual rituals, the lack of the seed also resulted in the gradual loss of the traditional spiritual practices associated with it: "It is a challenge [to perform community rituals] because of the lack of finger millet," said Anesu. And Anodiwa explained how "We couldn't brew beer in community because there was no finger millet." In response to the lack of finger millet community members "had to use maize meal which is forbidden by the ancestors" (Anodiwa), "cutting corners in preparing the brew and traditional dishes … [so that] The ancestors are not pleased" (Zendaya). As they observed an increase in pest and diseases, participants started to create causal connections between the use of maize for rituals

(as Anodiwa said, forbidden by the ancestors) and that increase. Most participants lamented the loss of spiritual protective practices, what Ruwadzano called the shield, and "now that shield [of protection] has lifted, our community is exposed." When the seed was regarded as sacred, it was planted not only for body and land nourishment, but also for nourishing a spiritual and connective ancestral community practice. When speaking about the loss of traditional finger-related spiritual practices, Anodiwa said, "I think this has also caused a break in our community since we were practicing our rituals together before." Ruwadzano was more direct, pointing to Christianization as the culprit of this disappearance: The church is a cross section of the community where all these problems and diseases are."

As mentioned above, the reduced availability of finger millet for community rituals also profoundly changed participants' social relations, something that every single participant referred to as cause for sadness: "There is saddens, we have lost a great part of our culture," said sadly Anochengeta. Since finger millet rituals created a space of communal gathering, their decline contributed to social disconnection between them: "Now we have less [finger millet] so we have less community and traditional practices to bring us together," said for instance Anesu. And Zendayafurther explained:

> I feel that we are disconnected in our community because of our lack of communal ancestral ritual. We as a people used to brew lots of beer and so many people would gather. When we used to have a rain ceremony the whole community would come and gather. But now that we are not planting finger millet, we brew very few beers and have very few social interactions to create community.

One participant, Zendaya, described clearly an iterative negative loop: The lack of finger millet seeds in the community led to its reduced consumption (and thus demand) and to the decrease of rituals, which, in turn, led to the intergenerational loss of both 1) the spiritual knowledge connected to those rituals as well as 2) the dietary habit of consuming finger millet, eventually resulting in less physical seed and need for finger millet therefore less plating of the grain because of lack of seed In her words: "Fewer people practicing our traditional rituals and coming together are a result

of the decreased growing of the finger millet here, and the decrease growing [of finger millet] reinforced that lack of community and ritual."

Although participants felt deep sadness and social and ancestral disconnection because of the loss of finger millet, they did believe that there existed ways of breaking the "disappearance loop" we discussed above. They had a vision of how to revive the plant and reconnect as a community to create the strong spiritual, agricultural, and social link they once valued. We discuss their solutions for the future in the next section.

3.5 Participants' Vision for Reviving Finger Millet

The last question of this research looked at opportunities for the revival of finger millet. Participants mentioned four different ways that could spark restoration: 1) Involvement from traditional leadership and elders, 2) Intergenerational knowledge sharing 3) Youth engagement, and 4) Zimbabwe government action. Most did not speak exclusively about one but a mixture of all four.

Several participants argued on the importance of engaging the local leaders in reviving and protecting finger millet: "We need the chief and his family to initiate the process to revive these traditions surrounding finger millet. No one can action anything unless sanctioned by the chief and the leaders of the land." (Itai). Similarly, Mai Shumba said: "Our chief needs to decree the need for reviving our old ways for community". And Anesu explained in greater detail:

> The Headman should encourage us to grow portions [of finger millet] so that we can contribute to the community beer brewing ceremony when required. I feel that if the Headman enforces it, we would have enough for communal ceremonies and rituals, but this has not happened.

Others mentioned that their current leaders would need to be reminded about the importance of rituals for people in the community, suggesting the need for "Traditional leaders to have a workshop to understand their key role and what they want to take on from the community. Then wider workshops set up by them for the key people in the community" (Kutenda).

In addition to engaging leaders, participants suggested creating community gatherings for sharing elders' knowledge with younger generations. Aizivaishe, a younger woman, believed it to be

important “to enlist the help of local elders to first teach us the significance of finger millet in our society and culture.” And Anesu, an elder, suggested they could “Hold awareness campaigns and enlist the wisdom and help of the community elders regarding finger millet to teach the youth”. Ropafadzo believed that there could be a sort of mentorship for younger people: “Young people … need to be taken as apprentices and be allowed to attend meetings and secret rituals with the elders”. And Anesu even suggested “having cooking clubs for youths run by older generations.” Another space where traditions related to finger millet could be revived and protected was the family. Anochengeta, for instance, suggested elders should “eat traditional dishes with the children so that they can catch on … every morning my grandchildren demand for breakfast with finger millet sweet drink”. And Mbuya Zendaya’s grandson confirmed this the passing of wisdom in the family would work, when he said: “I know these things because of my mother and grandmother, they tell me why it is important. But I don’t think I could convince my friends that it is important or teach them what finger millet sadza is. It needs to start within the family”.

A few participants suggested that outsiders – specifically researchers and politicians – could also play a role. Miriro, for instance, suggested that research on finger millet would “helps us come back to our roots,” and Tonderayi said this research motivated participants to the extent they were now “thinking we could bring back community programs to grow finger millet again!” The Zimbabwe government had also a key role to play: “Instead of giving us maize like they did, they should [now] give us finger millet seed.” (Zendaya), even if just through “An announcement … by authorities [that] will get everyone to grow finger millet again” (Tonderayi).

4. Discussion

This study aimed to understand the effect of the disappearance of finger millet on the resiliency of the indigenous community living in Chikukwa. Findings from this study provide evidence that this erasure contributed to making the Chikukwa community less physically, socially, spiritually, and environmentally secure. The diagram below shows a summary of the benefits reported by my participants as well as the reasons for the disappearance.

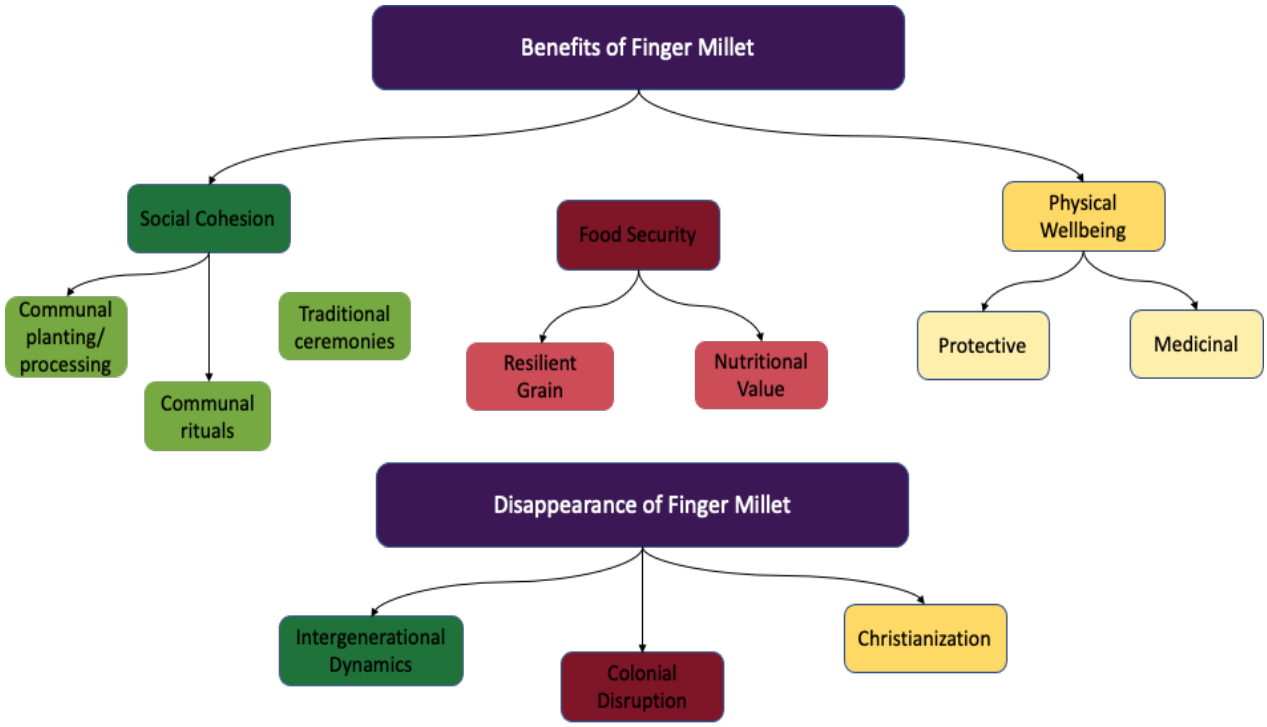


Diagram 1: Summary of key findings

Diagram 1 does not split the findings between the two groups. This was not split because the research found little difference between what each group believed were the benefits and reasons for disappearance. The difference between the two groups only lay in blame for knowledge not being passed down. The interviewees believed it was the younger generation not wanting to learn while the younger focus grouped concluded it was the "community knowledge keepers" not wanting to share. This finding instead showed that there was a deep disconnect between the two generations.

The research showed that before the disappearance of finger millet there was a strong social cohesion through the social cohesion brought together by finger millet.

My first key finding relates to the causes of the quasi-erasure of participants' practices connected to finger millet. Evidence from this study points to three key contributing factors, aligned on a (post)colonial continuum of exploitation that connects the introduction of hybrid maize during the British colonial domination with the policies of independent Zimbabwe that further fostered its use to meet international economic demands, and the Christianization of the country that eradicated the sacred ritual meaning of indigenous crops. Evidence on the effect of this continuum

of colonial exploitative, extractive, and destructive practices has been reported in former colonies by the few studies available on the topic. Weerasekara et al., for instance, presented historical evidence of how the Sri Lankan food system was dismantled by the Portuguese, Dutch, and finally British colonial rule that replaced healthy eating habits and food sovereignty with an industrial food system causing hidden hunger and irreparable ecological damage (Weerasekara et al. 2018). Similarly, Markowitz described the influence on Spanish colonialism on the Andean food system creating taboos of local food varieties and weakening the food security (Markowitz 2022). Similar to what happened in Chikukwa, the agricultural policies in these colonies imposed monoculture of external plants that threatened indigenous populations' food security and increased their dependence upon the national agricultural market system (Jacques and Jacques 2012; Bjornlund, Bjornlund, and van Rooyen 2022).

Another key finding from my research presented evidence on the negative consequences of the loss of finger millet for participants' physical, social, and spiritual health, as well as the health of their land. The disappearance of finger millet, which was mostly replaced by hybrid white maize, created an environment of eating nontraditional foods associated with finger millet which eventually increasing food-related diseases. Scientific evidence on the nutritional properties of finger millet provides credit to participants' observations. The plant has higher nutritional density when compared to hybrid maze (Chandra et al. 2016; Gupta et al. 2017) as well as the highest calcium content of a majority of grains, making it extremely beneficial for all stages of life (Ramashia et al. 2018). The main protein in finger millet (eleusinin) provides crucial nutrients (tryptophan, cystine, methionine, and total aromatic amino acids) that are crucial to human health but are deficient in most cereals (Chandra et al. 2016). Finger millet has such nutritional value that researchers blamed its abandoning as one of the main causes for famine in southern Africa (Maharajan et al. 2021). The consequences of the disappearance of finger millet were not limited to participants' physical health: traditional rituals around finger millet created spaces for the community to discuss their needs in the face of possible climate uncertainty, similarly to what others found in land-based communities around the world (Swiderska et al. 2022). Similar 'panpsychist' worldviews, researchers suggested, play a key role in the resiliency of indigenous systems, embedding sacred agroecological rituals that unite people with their land (Wright 2021b). The loss of finger millet also led to land infertility. As Singh and Singh suggested, exploitative

agricultural systems similar to the one imposed on Chikukwa are leading to a decline in the health of the land in an harmful cycle that is threatening the very survival of our species (Singh and Singh 2017), similarly to what McMichael and Patel found, respectively, in India and Mexico, where agro-business development practices implemented intensive farming in the two countries (McMichael 2007; Patel 2013).

Another important finding relates to the holistic nature of the food production system in Chikukwa, what I call the land-spirit connection. Participants continuously cross-referred to finger millet when speaking of food, medicine, community, agriculture, and spirit. To them, the health of the land (which guarantees the physical health of the community) is dependent on the community's spiritual and social health. In their worldview, land, body, community, and spirit are thus tied in a land-spirit connection that other researchers have found to be typical in indigenous African food production systems (Tarusarira 2017). Researchers warned that western scholars often overlook indigenous worldviews that integrate food within social, physical, and spiritual health; the overlooking is dangerous as this integration is key in the functioning of resilient indigenous agricultural systems (Eyong, n.d.; Rahman, Moussouri, and Alexopoulos 2021). In other words, in these systems the land is important because it nourishes the body as much as the spirit and the community in ways that are transmitted across generations: indigenous agricultural practices create a sacred ritual space in which people of all ages participate, guaranteeing the intergenerational survival of these sacred practices (F.G.H. Lupton 1996). These practices exist because of indigenous worldviews in the land-spirit connection do not position humans at the center of the cosmos, but in balance with it. That is, communities with holistic food systems, like Chikukwa once had, do not see the system functioning outside of themselves: they are in the food system as much as the land and the animals. Only by understanding these linkages can we dignify indigenous populations' worldview in ways that will help them protect, revive, and/or build a resilient food and cultural systems (Swiderska et al. 2022; Wright 2021b). Researchers interested in similar land-spirit connections have largely gathered in the fields of biocultural heritage and subtle agroecology. These researchers advocated for a radical new view of agriculture informed by indigenous people's cosmovision, where the land-based culture is linked to the conservation of their food system in a reenforcing loop (Swiderska et al. 2022; Tarusarira 2017; Wright 2021b). My findings help other to further understand the reasonings behind the destruction of indigenous

agri-cultural systems, such as the one that existed among the Chikukwa: when maize replaced finger millet, it did not only cause a disruption in the food system but dismantled the bedrock of their culture that rested on a set of spiritual-social practices.

This study has two main implications for future policy, research, and practice. The first relates to the need to deepen the agroecological understanding of resilient indigenous systems for climate adaption. My finding on the land-spirit connection is important for the work of those striving to reintegrate indigenous food sovereign community systems (Pimbert 2018). My evidence suggests that agroecological food programs must engage with the spiritual and social systems of rituals and beliefs that made indigenous food system resilient. Precisely because of their spiritual connection with food and land, indigenous populations take loving care of it: not because it generates revenue, but because that land is us; that is: because in the land we found meaning and human connection (Tarusarira 2017). The simple reintroduction of indigenous plants is not enough: effective decolonial policy and practice must understand and engage with the spiritual rituals and beliefs connected to those plants because they guarantee the community cohesion needed for resiliency and food sovereignty.

The second implication relates to the importance of integrating indigenous cosmologies into agricultural policy making using participatory co-creational processes. Increasingly, researchers have been urging policymakers to invest in the co-production of hyperlocal agricultural solutions (Hanspach et al. 2020). To my knowledge, however, similar co-production processes have largely ignored the importance of engaging with indigenous populations in spaces of co-creation that are designed around and create space for non-western understanding of the land-spirit connection. Honoring the voices and ideas of the participants in this research, future practice will have the opportunity to engage with humility in co-productive conversations that are designed to allow non-western vision of the world into the room, in ways that might be surprising or traditional agriculture policymakers and that yet are so fundamental to the indigenous populations for whom those policies are designed.

5. Conclusion

This qualitative research investigated the effects of the erasure of finger millet on the social, spiritual, and physical health of an indigenous community (the Shona community of Chikukwa, eastern Zimbabwe). The research uncovered three major benefits of finger millet: 1) Food security, 2) Nutrition and health and 3) Social spiritual cohesion. I found that all three of these benefits helped to create a community that could persist in time of uncertainty. Participants also agreed on four major disruptions to their traditional systems: 1) Colonization, 2) Christianization 3) Zimbabwe's agricultural policies and 4) intergenerational community dynamics. I would argue that the system that existed in Chikukwa was one what had aligned with an agroecological system. As shown in the results a finger millet centered system integrated biodiversity in food production. The research showed that when planting finger millet, they were direct seeding with minimal tillage and alongside this there was planning native squashes and peas etc. Participants also claimed that they used no external inputs but onsite compost when needed. Off the farm level there was an embodiment of the social aspect of agroecology in the traditional system of Chikukwa as well for example the co-creation of knowledge which was passed down through intergenerational knowledge exchange, and the embodiment of culture and food traditions that are integrated in the system as well as the interconnects with nature and the agriculture system.
The extractive neocolonial agricultural practices implemented in Chikukwa led instead to greater food insecurity, mostly due to the loss of the protective effects of native and companion plants that was provided by the finger millet system.

These findings highlight the need to integrate a holistic framework when gleaning agricultural knowledge from indigenous communities, one that weaves the technical practices, traditional seeds as well as understanding the rituals involved. The land-spirit connection of the community allowed for them to be resilient and agile in the face of vulnerability by creating social gatherings where the community could interpret and discuss early signs of environmental differences which helped them to prepare for and respond to them. Similar agile systems are needed to face the challenges of climate change in southern Africa, but their revival requires reconnecting land and spirit: these two systems were destroyed together in Chikukwa and can only be regenerated in synchrony.

While the cultural genocide of indigenous agricultural practices is already a tremendous loss for the whole human species (other than a serious violation of indigenous people's rights and dignity),

its consequences will be (and are) felt by the entire human population (Altieri et al. 2015). Climate change-caused erratic weather patterns are decreasing the yield in maize, especially in Zimbabwe. The decreased yields in Zimbabwe are causing an economic and food crisis that is felt by both indigenous and non-indigenous populations (Rurinda et al. 2015). These negative effects of climate change will eventually, extend to all those living in countries who buy maize from Zimbabwe (and by extension, by other countries who similarly are mindlessly implementing post-colonial (or should we say neocolonial) industrial agricultural practices (Jacques and Jacques 2012; Munsaka et al. 2021; Altieri et al. 2015). Colonial arrogance is at the core of the destruction of indigenous plants. The local native grains have been seen as lesser than the western wheat and maize, much less valuable on the global market. Yet, because of the global and urgent need to adapt to global climate change, resilient grains like finger millet are receiving more attention, mostly (and sadly) because the western markets have started to deem them valuable. Despite this recent surge of interest, however, there still exist major research gaps to understand their full potential (Vijayan et al. 2022). Future research should continue to investigate the land-spirit connection that this study pointed at as the key feature of resilient indigenous systems in southern Africa.

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Appendices

Appendix A : Participant Tables

Table 1 : Focus Group Participants

Name	Sex	Age Group
Anokosha	Female	35-40
Aneni	Female	25-30
Danai	Female	25-30
Fadziso	Female	35-40
Maita	Female	20-25
Mudiwa	Female	20-25
Vimbo	Female	35-40
Rufaro	Female	25-30
Annona	Female	30-35

Table 2: Semi-Structured Interview Participants

Name	Sex
Anochengeta	Female
Miriro	Female
Ropafadzo	Female
Itai	Male
Zendaya	Female
Ruwadzano	Female
Anesu	Female
Anodiwa	Female
Aizivaishe	Female
Chatunga	Male
Kutenda	Male
Shohiwa	Male
Tonderayi	Female

Appendix B: Consent Form Example

Please note script was read out loud in English and then translated into Shona by my counterpart.

Introduction (*): Hello [again], my name is Mallory. I'm currently graduate degree with NMBU and ISARA

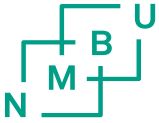
- In my study, I want to investigate traditional knowledge around finger millet. I'm interested in elders who hold this wisdom as well as were around during the introduction of hybrid maize into the community and the independence of Zimbabwe. If you choose to be a part of this project, here is what will happen:
- **Interviews**: We will have a semi-structured conversation with you where I will ask a range of questions about finger millet, sacred practices, community engagement, traditional knowledge, Shona culture, Christianity
- **Data sharing/ access/ confidentiality**: The answers you give will form the basis of my master's thesis.
- **Data storage**: I will store your data safely and confidentially on an external drive**/ photos/ notes**: With your permission, I would like an audio recording of our discussion to make sure I'm getting an accurate record of the interview Instead of recording you, I can take notes in my notebook. Which would you prefer?
- **Keeping contact details:** I would also like your permission to keep your contact details so that I can re-contact you to clarify information you gave me in your interview.
- **Rights**: You don't have to take part; you can ask me any questions you want before or throughout; you can also withdraw at any stage of the interview without giving a reason.
- **Publication plans**: The project may be published in a thesis/ academic journal and/or creative works
- **Complaints/ concerns procedure**: If you have any complaints or concerns please feel free to contact me.].
- **Questions/ concerns**: Do you have any questions?
- Do you give your permission for me to interview you/ take your photo/ video/ audio record you?
- [Do you give permission for me to re-contact you to clarify information?
- Do you give me permission to quote you directly without identifying you]?
- Are you happy to take part?

Ok, thanks, let's start.

Appendix C: Example of raw data analysis

Theme	Code	Data
Physical Health	Hunger	However, all that stopped when people realised that finger millet needed more labour to grow but now that area in deep in hunger.
	Hunger	Also, during drought periods you can cook just a small amount of finger millet meal and the whole family will survive.
	Medicinal use	Finger millet on its own is medicine. If you soak the husks for a while and use the water to prepare porridge – it's a bit sour, but it stops running tummies in babies and adults alike
	Medicinal use	It helps greatly when a sick person is not eating. You make porridge out of it and they start to recover immediately
	Medicinal use	We also make traditional drinks for babies who would have just been weaned. It is highly nutritious
	Medicinal use	Of course it is medicine. It is medicine for running stomachs and most aches.
	Medicinal use	They always go hand in hand because most traditional medicines work with finger millet meal not maize meal (sadza).
	Medicinal use	Sometime when you are sick and to eat finger millet meal, you would not empty your bowels for two consecutive days- it will be working and repairing whatever

		was lost. That's a sign that you are healed.
	Medicinal use	It was our staple. It was also medicine for common sicknesses like stomach aches or diarrhea. You'd make porridge with it.



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