

## **Traditional food crops as a source of community resilience in Zimbabwe**

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### **Abstract**

This article draws upon local narratives and observations of food sustenance practices in relocated farming communities in Sebakwe, Zimbabwe. Local knowledge on traditional food crops and related agricultural practices were proven to be a source of local community resilience enabling residents to sustain their livelihoods. Local community agency in maintaining, cultivating and processing traditional food crops was found to sustain their culture and livelihoods, thereby providing community resilience in a changing environment.

**Keywords:** Agrobiodiversity; climate change; diversity; traditional food crops; food security; local knowledge; resilience; adaptive learning

### **Introduction**

Resilience has been defined as the capacity of a system to absorb shock while maintaining function (Folke et al. 2002; Resilience Alliance 2008). With regards to social-ecological systems, this refers to the ability to withstand external stress and disturbance that results from social, political and biophysical environmental changes (Adger 2000). Links have been identified between ecological systems and social systems, reflecting the co-dependence and co-

evolution of these systems as complex adaptive systems (Folke et al 2002). These links include relations between culture and biological diversity (biocultural diversity) (Cocks 2006) as well as between urban communities and urban environments/ecosystems (Tidball & Krasny 2007). In the present study we broaden this analysis of linkages to the interrelationship between rural farming communities and traditional agro-ecosystems within the framework of livelihood sustenance.

Three key attributes of resilience are identified within integrated systems of people and nature: i) the **ability to get back** (capacity to absorb shock and still maintain function); ii) **self-organisation**; and iii) the ability to build and increase **capacity for learning and adaptation** (Folke et al. 2002; Gunderson & Holling 2002; Folke 2006). The first attribute hinges on **diversity** within a system, which is essential for absorbing disturbance and regeneration (Folke et al. 2004). The concept of resilience and its related attributes is used in this study as a lens to explore the livelihood sustenance strategies of resettled farming communities in Sebakwe, Zimbabwe. Here we examine how local farming communities are able to re-organise their social sustenance systems under pressures from environmental vulnerability so that food security and sovereignty can be achieved. To emphasise the value of local knowledge and epistemologies too often marginalised by hegemonic knowledge discourses, we have prioritised local names and terminology over scientific terminologies.

### **The role of traditional food crops in providing food security**

Traditional food crops have been the fundamental sources of food and nutrition for indigenous communities since time immemorial, providing food security for local people. However, with the introduction of modern cash crops, traditional crops have been (and still are, to a large extent) marginalised and excluded by modern conventional agricultural practices. Their value as food sources has declined as they have been superseded by commercialised hybrid food crop varieties. This has been accompanied by the stigmatisation of traditional foods, their labelling as 'food for the poor' and a characterisation as inferior crops (Shava 2000 and 2005; Asafo-Adjei 2004). This marginalisation of traditional crops in favour of commercial crops has been experienced within farming communities in Sebakwe. They are generally considered minor crops. However, most of the newly introduced commercial food crops are not adapted to local conditions and require high inputs of agrochemicals such as fertilisers, mechanisation and water supply. In the advent of adverse environmental conditions and lack of inputs, modern cash crops have left local communities in

Sebakwe vulnerable to hunger and malnutrition due to crop failures. As was evidenced in this study, in such instances traditional food crops have (re)emerge prominently as a source of community resilience to food insecurity.

### **Farming community context of the study area**

This case study was undertaken in resettled farming communities around Sebakwe Black Rhino Conservancy, areas primarily dependent on agriculture for their livelihood sustenance. As a result of the Zimbabwean government's accelerated land resettlement programme of the early 2000s, these communities are a complex mix of cultures, ethnicities, traditions and practices, integrating people from diverse/disparate socio-cultural and geographical contexts across the country. The resultant dynamics of environmental (socio-cultural and biophysical) change have disrupted pre-existing social and environmental resource stability that residents of these communities had been dependent upon. In the socio-cultural sphere, migration has disturbed the stability of supportive traditional social institutional structures and systems such as kinship, extended family relations, as well as shared cultural norms. The consequence has been ethnic and cultural heterogeneity.

From a biophysical perspective, the community residents now find themselves in a relatively new geographic landscape. This presents challenges with regards to the availability of and familiarity with ecological resources that are the mainstay of the livelihood systems of many rural communities. The biophysical system is also under stress from the human population influx and demand for agricultural land (a shift from its earlier use for game farming) and ecosystem goods and services such as fuel wood, construction material, food resources (fruits, vegetables, game meat) and water. Also, while these communities claim to be heavily reliant on modern conventional agriculture, specifically cash crop farming, they are at risk. They are vulnerable to soil unsuitability, erratic rainfall patterns (characterised by persistent droughts), unreliable supplies of agricultural inputs such as seed, farming implements and agrochemical inputs (fertilisers, herbicides and pesticides), and fluctuating market prices for their produce. This study looks at local community strategies to cope with these stresses from an agricultural (food sustainability) perspective in the prevailing contexts of environmental risk, vulnerability and uncertainty.

## **Research methods**

This was a qualitative ethnographic case study (Wiersma 1986) aimed at examining the livelihood sustenance strategies of local resettled farming communities around Sebakwe Black Rhino Conservancy in Zimbabwe. It was set against a background of declining commercial agriculture productivity caused by, among other things, unprecedented climatic variability. Our research focus was food crops and related wild food plants as these are indicators of a rural community's ability to sustain itself. Through this we were able to explore the changing role of the significance of traditional food crops for community sustenance.

Following preliminary interviews with community members in four villages, a total of six farmers, selected on the basis of availability and willingness to participate, as well as their knowledge of traditional food plants, were interviewed. In-depth unstructured interviews were conducted in the local language (chiShona). The farmers were generally asked how they utilized agricultural practices to ensure food security in their homes. Although the researchers had a set of predetermined topics to address (Schurink 1998), neither the sequence of questions or the specific wording of questions was uniform. Open-ended questions were used in order to avoid restricting the participants' answers and to give respondents control over what they wished to say and how they wished to say it. Questions focused on food crops and livelihood sustenance. While the initial focus was on the types of crops grown by the local communities, the role of traditional food crops in providing food security in the context of environmental vulnerability emerged as an important theme during discussions with the farmers. The unstructured nature of the interviews allowed the participating farmers to express themselves freely and at length and enabled the researchers to capture unexpected insights on food security (Lecompte & Priessle 1993). This would have been missed in a more structured questioning approach. The interviews were made easier because one of the researchers was based in the area and familiar with most of the participants. Interviews were substantiated and triangulated with observations of food crops found growing in the fields around their homes.

## **Emerging findings/outcomes from the study**

Several findings and observations on the role of traditional food crops in providing food security emerged from the interviews. In this section we discuss

each of these findings, with a particular emphasis on multiple aspects of diversity in agricultural practices.

a) Self-organisation and adaptive learning

At the time of the study the Sebakwe area had experienced during the preceding summer growing season (October 2007 to March 2008) a period of drought alternating with heavy flooding. These combined weather extremes, among other factors, contributed to low cash crop outputs, thereby negatively impacting on food security for the affected communities. These adverse climate conditions were not new and have been experienced in other years, and are likely to recur in the future.

The local communities' adaptive capacity, their ability to tolerate and deal with change, to respond to the prevailing contexts of environmental risk, in order to meet their food needs, was evidenced through their self-organising, self-driven agency to mobilise prior knowledge on traditional food crops. Linked to this was the ability of the local communities to predict weather changes (through the gathering and interpretation of information on local weather conditions) and to make decisions on cropping patterns based on these predictions (Nyong et al 2007). The evidence of this prior knowledge (social memory capital) came through in interview discussions. Individual farmers made repeated reference to the traditional food crops and agricultural practices that they were exposed to when growing up in family homes in their areas of origin. This mobilised knowledge was then applied to revive/resuscitate previous traditional agricultural practices. It was imposed onto the present farming culture in which they lived as an added strategy in the struggle for food sustenance. It thereby provided a buffer to food security risks. This application of traditional knowledge was implemented in the growing, harvesting and processing of traditional food crops and in the storage of seeds for future use by community members. These traditional agricultural practices were similar among farmers of different origins, indicating a convergence of strategies to respond to and address the common problem of food vulnerability. Related to this convergence of approaches was a common collaborative culture cited by many interviewees to share both the produce and seeds within the community.

The fact that the present communities in Sebakwe were re-learning and relying on traditional agro-ecosystems as appropriate strategies to ensure food security when encountering food vulnerability could also be an indication of a history of exposure of their original communities to similar vulnerability in the past

(Tengo & Belfrage 2004; Gallopin 2006). In other words, these communities had learnt to respond to their (biological, physical and social) environment by developing these traditional agro-ecological systems over time (Holmgren & Oberg 2006). To cope with current conditions of risk and vulnerability, the communities in Sebakwe were drawing upon a collective social memory. This conclusion is supported by evidence of recorded periodic droughts in southern Africa (Holmgren & Oberg 2006) and from discussions with the farmers. It is a suggestion supported by Nyong et al (2007) in their observations in the Sahel that:

Local populations in this region, through their indigenous knowledge systems, have developed and implemented extensive mitigation and adaptation strategies that have enabled them to reduce their vulnerability to past climate variability and change, which exceed those predicted by models of future climate change (2007, 787).

Folke et al (2002) and Folke (2006) argue that in resilient social-ecological systems disturbance has the potential of creating opportunities for innovation and development. In the present study, these social learning processes are occurring in response to common challenges that local communities are facing in maintaining their food resources. The mobilisation of prior knowledge and its application in new contexts of vulnerability demonstrates an ability of local communities to build and enhance capacity for learning and adaptation. Reflexive competences, the ability to live with change and uncertainty and to manage change, are revealed. It appears that when faced with external disturbances that threaten livelihood sustenance, such as climate induced extremes, local communities adopt a predominantly subsistence-oriented strategy. This is manifested in traditional agricultural practices which are able to carry the community through turbulent times. The community is likely to revert back to a more commercially-oriented agriculture livelihood strategy when conditions are more favourable. This strategic self-regulated capacity to alternate between different livelihood approaches enables local community resilience to adapt to and survive climate induced variations in their lived environment.

#### b) Diversity

Traditional agro-biodiversity, that is diversity in traditional food crops, was observed at three levels: i) the diversity of crops grown in a single field; ii) a

diversity of varieties within a single crop; and iii) diversity in micro-environments selected for growing particular crops.

i. Diversity of crops within a field:

A characteristic feature of all the fields visited was the diversity of crops exhibited within each field (Figure 1). Growing within a predominantly maize planted field were several other sown crops: nyovhi (spider flower); mubovora (pumpkin); nyemba (cowpeas); ipwa (sweet reed). Also present were self-seeding 'weeds' (weeds in modern conventional agriculture perceptions) such as: *derere renyenje* (wild okra) and *musungusungu* (black nightshade) that are allowed to grow with cultivated crops because of their food value as vegetables. The use of wild food plants to augment cultivated staples, particularly in times of food shortage, has also been observed as a livelihood sustenance strategy for rural communities in Northern Nigeria (Harris & Muhammed 2007). Pimbert (1999) records that many rural people who are reliant on agro-ecosystems, deliberately incorporate wild resources as part of their livelihood strategies.

Such a richly diverse field (Figure 1) is able to supply both the starch staple and the accompanying relish to complete the traditional meal. Growing different crops enabled the provision of balanced nutrition, such as the supply of carbohydrates from cereals, vitamins and minerals from leafy vegetables, and proteins from legumes. The elderly farmers commented on how their traditional diet made them stronger, healthier and gave greater longevity as compared to modern diets.

Diversity within a field as a sustenance strategy also ensured the harvesting of other crops in the event that the main crop (maize) failed, thereby minimising risk from external environmental uncertainty. In this case crop diversity capital absorbs the risk of harvest loss due to unanticipated adverse climatic conditions by spreading it across a variety of crops with different climatic adaptabilities. This contributes to creating a robust food crop system that can withstand a wider range of environmental changes. Nair et al (2007) have similarly found crop diversification used as a coping strategy to accommodate risk and uncertainties by agricultural communities in Kerala, India. The sharing of such valuable agricultural knowledge and practices is educationally relevant for the continued sustenance of communities, particularly among the youth, residing in such contexts. A list of traditional crops cultivated in the area is given in Table 1. Among traditional crops identified are those that are indigenous those that

have been introduced and have been grown by local peoples over a long period of time. The latter are considered as traditional crops by local communities and have since been incorporated into their culture. The incorporation of introduced crops into existing traditional agro-biodiversity systems and local cultures is an indication of the dynamism of local knowledges (Shava 2000; Masuku van Damme & Neluvhalani 2004) that allows for growth from external interactions and for cultural evolution. In this way local communities have been able to develop robust and resilient traditional agricultural systems.

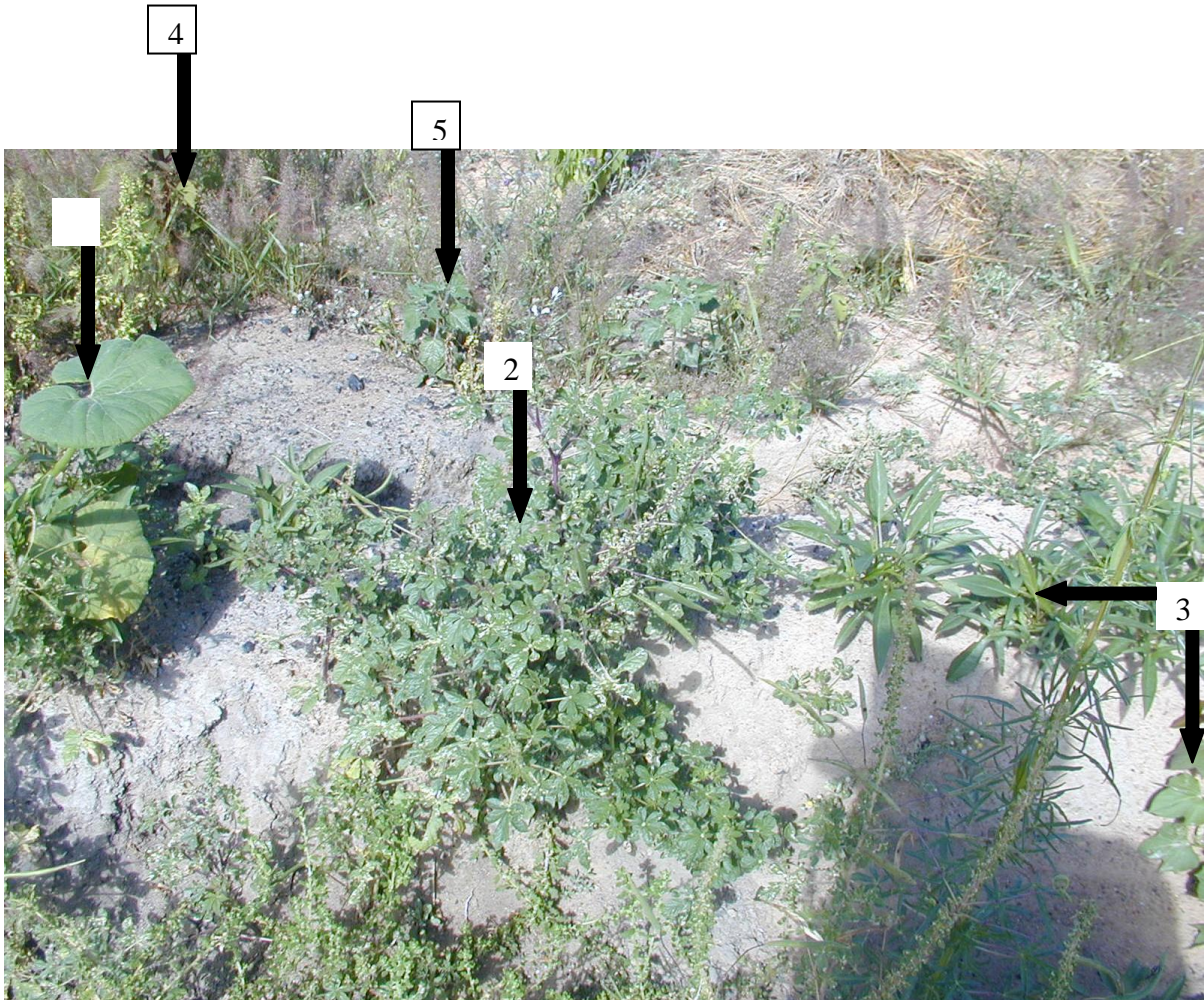


Figure 1: Diversity within a field - a maize field in which cultivated mapudzi<sup>1</sup> (bottle gourd – *Lagenaria siceraria*) nyovhi<sup>2</sup> (spider flower- *Cleome gynandra*), mbambaira<sup>3</sup> (sweet potato – *Ipomea batatas*), and self-seeding mowa<sup>4</sup> (pigweed - *Amaranthus hybridus*) and mubvunzandadya<sup>5</sup> (goosefoot - *Chenopodium album*), all pointed out as edible, are growing together.

ii. Diversity of varieties within a single crop

During interview discussions the farmers noted that there were varieties within certain crops that were specially selected by individual farmers. These included early maturing traditional maize varieties such as *mukadzi usaende* or *mukadzi dzoka*, (literally translating to ‘wife don’t go’ or ‘wife come back’) suited for the short rainy seasons or drought spells as well as late maturing traditional maize varieties suited for the longer rainy seasons; and white and red varieties of *zviyo* (finger millet) and *mhunga* (pearl millet). Growing different varieties of the same crop is said to better guarantee a harvest regardless of seasonal variability (short dry season or long wet season) and to ensure variety in taste and quality.

iii. Diversity in choice of growing sites selected for particular crops

Observation of planting sites revealed an in-depth knowledge of micro-environments (soil types, fertility, water) and their agricultural capabilities. Farmer knew which growing environment (microclimate) was suitable for specific crops. Drought resistant crops such as *rukweza* (finger millet), *mapfunde* (sorghum), *mhunga* (pearl millet) and *nyimo* (bambara groundnuts) were grown in poor sandy soils (Figure 2). Nutrient demanding crops such as *tsunga* (*Brassica carinata*) and *mubovora* (*Cucurbita maxima*) were planted on anthills (*churu*) and over disused dump pits (*gomba remarara*) where waste and ash from the kitchen were deposited (Figure 3). Water loving crops such as *mupunga* (rice) and *madhumbe* (*Colocasia esculenta*) were reserved for wetland areas (*matoro*) (Figure 4). This specialised knowledge of habitat choice for different crops has the benefit of ensuring successful growth and harvesting of the particular crops.

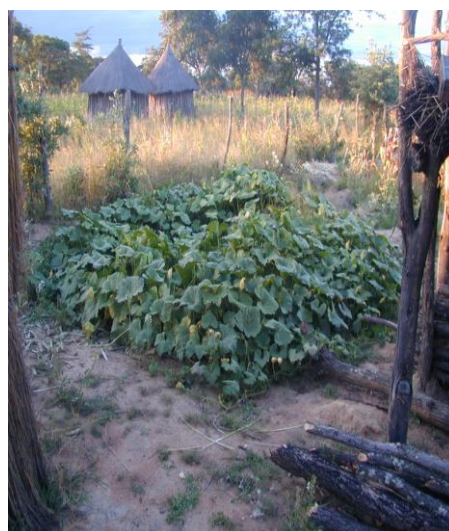


Figure 2: Rukweza growing on dry sandy soil



Figure 3: Mubovora growing in dump pit

Figure 4: Mupunga (rice) growing in wetland garden

c) Crop processing as a means of ensuring food security

Most crops are harvested, processed and stored for future use. This allows the community to fill the food gap during periods of scarcity, particularly in the cold and dry winter season. Processing food, besides preparing it for immediate consumption, included preserving it for later use. Sun drying (*kufusha*) was largely used for processing leafy vegetables (Figure 5). Leafy vegetables such as *mubovora* (pumpkin leaves) and *munyemba* (cowpea leaves) are sun dried to preserve them for later use. Sun drying is also used for *ipwa* (sweet reeds) which are first peeled and then dried.



Fig 5: Mai Gamba exhibiting mufushwa wemunyemba (sun-dried cowpea leaves)

Preservation of some crops involves elaborate processes. Groundnuts, for example, are roasted, winnowed to remove the skin coat, pounded in the mortar and finally ground into a paste (peanut butter) on the grinding stone (Figure 6).



Fig 6: Mbuya Mpfu grinding nzungu (peanuts) into dovi (peanut butter).

The preservation of seeds is important on many levels: for future planting, sustaining traditional crops and agricultural practices, and fostering independence from commercial seed sources. With most traditional cereals, the selected heads (or cobs) of grain were hung in the kitchen where smoke from the cooking fires preserved them from pest attacks.

**Table1: Some traditional food crops and plants in Sebakwe and their uses**

Local Name	English Name	Botanical Name	Food Type	Preparation
chiBage, chiBarwe	Maize	<i>Zea mays</i> **	Grain cereal	Dry seed grounded into mealie meal or pounded into samp and eaten with a relish. Green mealies roasted or

				cooked
muBovora, munhanga	Pumpkin, marrow, squash	<i>Cucurbita pepo**</i> and <i>C. maxima**</i>	Leafy vegetable, fruit, edible seed.	Leaves, flowers and young (mangare) cooked in cream (ruwomba) or mixed with peanut butter. Ripe Fruit cooked as a meal. Seed roasted as a meal.
muChakupuka, ndakupuka	Indian or Chinese mustard	<i>Brassica juncea**</i>	Leafy vegetable	Leaves cooked on their own or mixed with meat. Leaves also sun- dried for later use.
Chembere dzagumana	Rape	<i>Brassica napus**</i>	Leafy vegetable	Leaves cooked on their own or mixed with meat. Leaves also sun- dried for later use.
Derere renyenje		<i>Corchorus tridens*</i> , <i>C. trilocularis*</i>	Leafy vegetable	Leaves cooked with hundi (make from sieving water through burnt ground husks of finger millet) or soda into a slimy relish
Derere resamwenda/e		<i>Sesamum angistifolium*</i>	Leafy vegetable; seed	Leaves cooked with 'hundi' (make from sieving water through burnt and ground husks of finger millet) or soda into a slimy relish
Derere rechipudzi	Okra	<i>Abelmoschus esculentus**</i>	fruit	Young fruit cooked with 'hundi' (make from sieving water through burnt ground husks of finger millet) or soda

				into a slimy relish
iPwa	Sweet cane	<i>Sorghum bicolor</i> ***	Edible stem	Sweet stem chewed. Stem is also peeled, sun dried and stored for later consumption
muGaka		<i>Cucumis metuliferus</i> ***	Leafy vegetable, fruit	Young leaves cooked as a relish. Spiky fruit eaten raw.
maPfunde	Sorghum	<i>Sorghum bicolor</i> ***	Grain Cereal	Seed is ground into powder and cooked into sadza (thick porridge) which eaten with a relish. Also fermented and made into traditional beverages hwawa (beer) and mahewu
maPudzi	Calabash, gourd, bottle gourd	<i>Lagenaria siceraria</i> ***	Leafy vegetable, fruit, seed	Young leaves are cooked and eaten as a relish. The ripe fruit is cooked as a meal. Seeds are roasted as a snack.
Mbambaira, maDima	Sweet potato	<i>Ipomea batatas</i>	Edible tubers	Tubers are either eaten raw or cooked
mhunga	Pearl millet	<i>Penisetum americanum</i> ***	Grain cereal	Seed is ground into powder and cooked into sadza (thick porridge) which eaten with a relish. Also fermented and made into traditional beverages hwawa (beer) and mahewu
Mowa	Pigweed	<i>Amaranthus hybridus</i> *	Leafy vegetable	Young leaves are cooked as a

				relish
muBvunzandadya, muTyangetyange	Goosefoot, fat hen	<i>Chenopodium album*</i>	Leafy vegetable	Young leaves are cooked as a relish
muPunga	Rice	<i>Oryza glaberrima***</i>	Grain cereal	Seed is parboiled, ground into powder and cooked into sadza which eaten with a relish. Seed is also pounded an cooked with peanut butter as a meal.
muNwiwa, muVise, MuShamba	Water melon	<i>Citrullus lanatus***</i>	Fruit, seed	Ripe fruit eaten raw. Seed used to make edible oil or pound into balls and taken as a relish.
muSungusungu		<i>Solanum nigrum*</i>		
muTsemwatsemwa, muSemwasemwa		<i>Cleome monophylla*</i>	Leafy Vegetable	Leaves cooked as a relish
Mhuu, kanzota	Black jack	<i>Bidens pilosa*</i>		Leaves cooked as a relish
muNyemba, Nyemba	Cowpea	<i>Vigna unquiculata***</i>	Leafy vegetable, edible seed	Leaves cooked as a relish. Leaves are sun- dried and stored for later use. Seeds are cooked as a relish.
Nyimo	Roundnut, bamabara groundnut	<i>Voandzeia subterrana***</i>	Edible seed	Seed cooked as a meal
Nyovhi, nyevhe, rune/i	Spider flower	<i>Cleome gynandra***</i>	Leafy vegetable	Leaves cooked as vegetable on their own, with peanut butter or with meat. Leaves also sun- dried for later use.
Nzungu	Groundnuts, peanuts, monkey	<i>Arachis hypogea*</i>	Edible seed	Seed eaten raw, roasted or cooked. Seed is

	nuts			also roasted and ground into peanut butter.
Rukweza, zviyo, njera	Finger millet, rapoko	<i>Eluisine coracana</i> ***	cereal	Seed is ground into powder and cooked into sadza (thick porridge) which eaten with a relish. Also fermented and made into traditional beverages hwawa (beer) and mahewu
ruNinga	sesame	<i>Sesamum indicum</i> *	Edible seed	Seeds ground and made into a cherished peanut butter (dovi reruninga)
Tsungu		<i>Brassica carinata</i> ***	Leafy vegetable	Leaves cooked as vegetable on their own, with peanut butter or with meat. Leaves also sun-dried for later use. Plant cherished for its slightly bitter/pungent taste

Note:

\*wild plants ('weeds') that are allowed to grow together with cultivated crops because of their value as food

\*\*introduced crops that are considered traditional crops by local communities

\*\*\*native/indigenous cultivated crops

#### d) Threats to community traditional food security systems

Local community livelihood sustenance through traditional agriculture is dependent on two key factors: the **agricultural resources** (cultural capital), that is the availability and access to traditional agro-biodiversity; and the related **knowledge and practises** (collective social memory) of local communities that enable these communities to utilise the available agricultural resources for their sustenance. Resilience therefore emerges from the interplay between local community knowledge and practices and the agro-biological resources at the

community's disposal. Vulnerability of local communities results from a disruption of either or both of these two aspects, which subsequently erodes the capacity of local communities to adapt and respond to environmental change.

In this study several factors, both internal and external, were identified by the farmers as threats to local food sovereignty, that is, the capacity of local communities to produce nutritionally and culturally appropriate food and to control and maintain local food-producing resources and systems for their own sustenance: i) commercialisation of traditional crop produce and seed; ii) reliance on modern commercial seed varieties; and iii) limited trans-generational knowledge transfer interactions.

i. Commercialisation of traditional crop produce and seed:

Farmer participants in this study expressed their concern over a creeping commercialisation of all agricultural produce, particularly traditional food crops. For some, selling traditional food crops such as vegetables like *mubovora*, *nyovhi* and fruits like *magaka*, was, in the past, unthinkable. Some farmers recounted that traditionally, a hungry passer-by would not be prevented from entering a field and helping him/herself to *ipwa*, *magaka* and other ripe produce that could be eaten raw, so as long as the person did so only to satisfy his/her immediate hunger. A similar sentiment was expressed with regards to the sharing of seeds. It was said to be a common practice in the past that a person having seeds would freely share it with their neighbours in anticipation that the neighbour would reciprocate if the need were to arise. This culture of sharing was a strategy that enabled food and seed distribution within the community, thereby fostering resilience through maintaining traditional crop biodiversity and overall food security. Sharing produce and seed within the communities was witnessed during the study period.

Selling traditional crop produce threatens community food security and sovereignty by replacing the traditional barter economy with a modern cash-oriented economy. The latter negatively impacts on the traditional systems of distributing food produce and seed. Pimbert (2009) argues that radical monopolies, such as commercial entities, replace non-marketable use values of crops, for example, with commodities (commercial seeds) by appropriating the components that enable people to cope on their own (the sharing of seed and related knowledge), thereby undermining local food sovereignty.

## ii. Reliance on commercial seed varieties

Related to the commercialisation of produce, the current practice of modern agriculture reliant on seed companies to provide seeds each year was considered by most of the older farmers as a threat to food security and sovereignty (and thereby community resilience). It usurped the communities' self-reliance and increased dependence on external agents. They further maintained that a farmer was never sure of the success of the commercial crop varieties since he or she had no control over the selection of seeds. Added to that, the farmer had to first pay for the seeds in order to be able to grow it. Traditional crop varieties, on the other hand, were commended for their role in ensuring self-reliance with regards to access to and control over seed supply. Traditional seed production and selection processes were considered more reliable in terms of guaranteeing a successful harvest as local seed varieties were known to be adapted to local conditions.

Traditionally, seed was reciprocally exchanged among farmers. Related to this trading practice, was the communal practice of pooled labour and sharing knowledge on the propagation and processing of traditional crops. Shiva captures the significance of this system:

Seed is the ultimate symbol of food security...Free exchange among framers goes beyond mere exchange of seeds; it involves exchanges of ideas and knowledge, of culture and heritage. It is an accumulation of tradition, of knowledge of how to work the seed (Shiva 2000, 8).

## iii. Limited transgenerational knowledge transfer

Elderly farmers were concerned that their knowledge of traditional food crops and related agricultural practices was being lost as it was not reaching the youth. Transformations in learning processes and agricultural systems and the effects of modernisation were identified as some of the factors negatively impacting on traditional methods of transgenerational knowledge transfer. This hinged on the diminishing role of elders as educators, knowledge holders and referral points within the community (Kizerbo et al 1997). The stigmatisation of traditional food crops was also identified as a contributing factor. Many of the youth in the studied communities were said to shun traditional dishes and, from our observations, were found not to be growing traditional crops. The lack of effective mechanisms for the transmission of knowledge about traditional food

crops and skills related to traditional agricultural practices to the youth, therefore threatened the sustenance of food sovereignty within these communities. It disrupted the continuity of established local/internal resilience systems of ensuring food sustainability. There is a need therefore, to conserve the accumulated collective social memory on traditional agro-ecological knowledge and practices within existing communities.

## **Conclusion**

Local communities in Sebakwe rely on multiple systems for their livelihood sustenance. These include a combination of modern cash crop farming and traditional agricultural practices, with the former being dominant. However, in a context of risk, uncertainty and vulnerability caused by climate induced changes and lack of adequate agrochemical inputs and infrastructural support, traditional knowledge re-emerges and traditional agro-biodiversity and agricultural practices become prominent as a valuable livelihood strategy that proffers communities the capacity to manage, respond, adapt to and withstand environmental change and thereby sustain their food resources.

In this study food insecurity or vulnerability resulting from climate induced variability (drought and flooding) was observed to have a positive influence on local knowledge, traditional agro-biodiversity and traditional agricultural practices; it created an enabling environment for their re-emergence. Traditional food crops and related agricultural practices have been utilised by indigenous people over many generations and here they provide a source of community resilience by maintaining food sovereignty, meeting the needs of food and nutrition for rural households. Despite the diverse origins of the farmers in the studied communities, the similarity in the crop diversity exhibited revealed common cultural links over broader contexts. In the present heterogeneous communities this may have been augmented by the revival of a culture of sharing produce, seeds and related knowledge, as was observed during the study period. Such social learning processes and local agency that foster resilience should be articulated and represented.

However, traditional crop biodiversity and agricultural practices are under threat from their continued marginalisation by modern agricultural systems, disruption of cultural practices through modernisation of local communities and limited transgenerational knowledge and skills transfer. There is a need for developing contextually relevant educational processes which identify and build upon local coping strategies (local knowledge and expertise) towards achieving

resilient local communities with the adaptive capacity to manage environmental change.

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