THE NewsHawks

Food for thought

Maize is overrated - Embrace small grains

Food Security Blog
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A thriving sorghum crop at Icrisat Matobo Research Centre, south of Bulawayo. Pic by Brezh Malaba.

In Harare's leafy suburbs, one of the craziest jokes that cultural imperialism has inflicted on African people is playing out in a rather fascinating manner.

For centuries, black people have been told that traditional African cuisine, diet and culinary preferences are primitive, inferior and backward. To appear modern, educated and refined, people have had to abandon traditional dishes and embrace Western tastes.

A few generations later, the so-called modern diet is wreaking havoc on people's health, with lifestyle conditions such as obesity, diabetes, heart disease and hypertension consigning many to an early grave.

But how have Zimbabweans responded to this crisis? Some are now actively seeking out more organic and wholesome food, while others are frequenting restaurants that offer traditional African dishes. They avoid the usual maize-meal fare, sadza/isitshwala, choosing instead sorghum meal or other types of millet which are now hailed as superfoods. The grotesque irony, of course, is that the African delicacies now being sold in air-conditioned restaurants do not come cheap—and this is where the simplicity of village life trumps the pretence of urban sophistication. We have come full circle. Africa's past dishes are not dead; they are not even past.

Restaurants offering traditional African dishes are gaining popularity, and this surge in appreciation stems from a deep-rooted desire for Africans to pursue a healthier diet, reconnect with their heritage, celebrate their rich culinary traditions, and share their vibrant flavours with the world.

Perpetual Nyadenga, the Food and Nutrition Council of Zimbabwe's acting director of knowledge management, has a stark message: "We cannot develop Zimbabwe if we're not food secure. As we look at basic human rights, the first right we need to fulfil is the basic right to food security."

She adds: "Local foods, including indigenous vegetables and fruits, have been part of our diet and traditional food systems throughout human history. Contemporary traditional diets are known to offer valuable health benefits and form a significant portion of our total food basket for many households. Scientific evidence has shown that most traditional foods tend to be richer in micro-nutrients, and high use of our local traditional foods is linked with greater food security."

Maize is overrated

Maize, a crop which first arrived on the African coast from Mexico during the 17th century, deserves far less respect on this continent than it currently enjoys.

Africans have placed corn on a lofty pedestal, glorifying it as a wonderful staple food—yet the brutal truth is that maize is an inferior food crop and should have never been allowed to displace the superior traditional staple diet consisting of sorghum, millet, rapoko and yam in this part of the world. Maize really ought to be treated as a stockfeed and not the mainstay of African food security.

In this second instalment of our Food For Thought blog series—which takes a deep dive into food security issues—we present a compelling argument for embracing the nutritional powerhouses of sorghum, rapoko and millet over conventional maize.

There is no better moment to unshackle Africa from dangerous maize dependency than today. The United Nations General Assembly at its 75th session in March 2021 declared 2023 the International Year of Millets. The UN's Food and Agriculture Organisation correctly observes: "Millets can grow on arid lands with minimal inputs and are resilient to changes in climate. They are therefore an ideal solution for countries to increase self-sufficiency and reduce reliance on imported cereal grains."

INTERNATIONAL YEAR OF MILLETS 2023

For decades, maize has been the go-to staple food in Africa. However, as we confront the challenges of climate crisis, food security, and sustainable agriculture, it becomes evident that maize is not a sustainable choice for Africa's future. The reasons for reducing our dependency on maize are many, but here are the most compelling ones:

1. Vulnerability to climate crisis:
Maize cultivation heavily relies on predictable weather patterns and adequate water availability. Unfortunately, climate crisis brings extreme weather events, including droughts and floods, which pose a severe threat to maize production. As we witness erratic rainfall patterns and temperatures, the rain-fed cultivation of maize becomes increasingly risky. Investing in alternative crops that are more climate-resilient is crucial to safeguarding food security in the face of these challenges.

2. Environmental impacts:
The intensive production methods employed in maize farming take a toll on the environment. Large-scale monoculture systems degrade soil quality, deplete natural resources, and contribute to soil erosion. Furthermore, the extensive use of synthetic fertilizers and pesticides in maize cultivation leads to water pollution and damage to ecosystems. By shifting away from maize, we can promote sustainable farming practices that prioritise environmental conservation and protect delicate ecosystems.

3. Nutritional limitations:
While maize is a significant source of carbohydrates, it falls short in providing a well-rounded and diverse nutrient profile. It lacks essential micronutrients, including proteins, vitamins, and minerals necessary for optimal health. Relying heavily on maize as a staple food contributes to malnutrition and the associated health issues, particularly among vulnerable populations. Diversifying our food sources with more nutritious grains ensures a balanced diet and improves public health outcomes.

4. Economic vulnerability:
Maize's dominance on Africa's agricultural landscape leaves farmers economically vulnerable. Fluctuations in maize prices, coupled with the need for costly inputs such as fertilizers and pesticides, can push farmers into cycles of debt and impoverishment. Embracing alternative crops like sorghum, rapoko and millet—which require fewer inputs—can create a more economically viable and sustainable farming system for Zimbabwean and African farmers.

5. Loss of cultural heritage:
The reliance on maize across the continent has overshadowed the diverse culinary traditions and indigenous crop varieties that have sustained African communities for generations. By diversifying our food sources, we can revitalise and celebrate these valued culinary traditions, promoting a sense of cultural pride and reclaiming our food heritage.

Let's move on from maize

While maize has served as a staple food for Africa, its sustainability is increasingly in question. The susceptibility to climate change, environmental impact, limited nutritional value, economic vulnerability, and the erosion of cultural heritage underscore the need for a shift towards diverse, climate-resilient food sources. Embracing an array of crops, including small grains like sorghum, rapoko, and millet, can ensure food security, protect the environment, and improve the overall well-being of African communities. It is crucial that we prioritise sustainable alternatives to maize and pave the way for a resilient and prosperous future in African agriculture.

If not maize, then what?

In the quest for sustainable and nutritious food sources, small grains have emerged as the unsung heroes of Africa. Sorghum, rapoko and millet—often overshadowed by maize—possess exceptional qualities that make them superior food sources for the continent.

With their resilience, adaptability and remarkable nutritional profiles, small grains offer a solution to combat food insecurity, malnutrition and climate change.

Maize has monopolised the African diet for too long, leading to a lack of dietary diversity and its associated negative health consequences. Incorporating small grains into daily meals not only diversifies the diet but also helps preserve indigenous culinary traditions. These grains have been a part of African heritage for centuries, presenting an opportunity to reclaim cultural identity and promote a renewed appreciation for traditional foods.

Nutri cereals are superior to maize

Sorghum, rapoko and millet are far superior to conventional maize for the following reasons:

1. Nutritional value:
Small grains are nutritional powerhouses rich in essential nutrients, unlike maize, which primarily provides carbohydrates. Sorghum, rapoko, and millet contain significantly higher levels of protein, dietary fibre, vitamins and minerals when compared to maize. This superior nutritional profile makes small grains an ideal choice to combat malnutrition, strengthen immune systems and promote overall health.

2. Climate resilience:
One cannot ignore the pressing challenge of climate crisis that disrupts agricultural production in Africa. Maize is highly vulnerable to unpredictable weather patterns and requires ample water resources. Conversely, small grains such as sorghum, rapoko and millet exhibit superior drought tolerance, making them a sustainable and climate-resilient food source. By cultivating small grains, farmers can mitigate the risks posed by climate change, ensuring food security even in Zimbabwe's perennially arid agro-ecological regions 4 and 5.

3. Economic benefit:
Small grains offer significant economic benefits that cannot be overlooked. Maize production often demands substantial inputs, including fertilizers, pesticides, and water, which may be unaffordable for resource-constrained farmers. Conversely, small grains are known for their adaptability, requiring fewer inputs for cultivation. Farmers can cultivate small grains with minimal investment, reducing production costs and enhancing the economic viability of agricultural practices in Africa.

4. Dietary diversity and culinary tradition:
Maize has monopolised the African diet for too long, leading to a lack of dietary diversity and its associated negative health consequences. Incorporating small grains into daily meals not only diversifies the diet but also helps preserve indigenous culinary traditions. These grains have been a part of African heritage for centuries, presenting an opportunity to reclaim cultural identity and promote a renewed appreciation for traditional foods.

5. World food security:
Given the global population growth and the increasing demand for food, it is essential to identify sustainable and nutritious food sources that can benefit not only Zimbabwe and Africa but also the world at large. By promoting the cultivation and consumption of small grains, Africa can become a trailblazer in global food security efforts. The export potential of these resilient, nutrient-dense grains presents an opportunity to secure income and address food shortages on a broader scale.

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It's really a slam dunk
The time has come to recognise the true potential of small grains such as sorghum, rapoko and millet in revolutionising African agriculture and food systems. Their exceptional nutritional profiles, resilience in the face of climate crisis, economic benefits, promotion of dietary diversity, and substantial contributions to global food security make them far superior to maize. By embracing these small grains, Africa can foster a sustainable and healthier future for its people while showcasing the potential for a global agricultural transformation.

What do policymakers say?

Dr John Basera (pictured), the permanent secretary in the ministry of Lands, Agriculture, Fisheries, Water and Rural Development, argues that Zimbabwe should boost the production of small grains, which have shown remarkable resilience in the face of the climate crisis. He spells out other advantages of this type of crop.

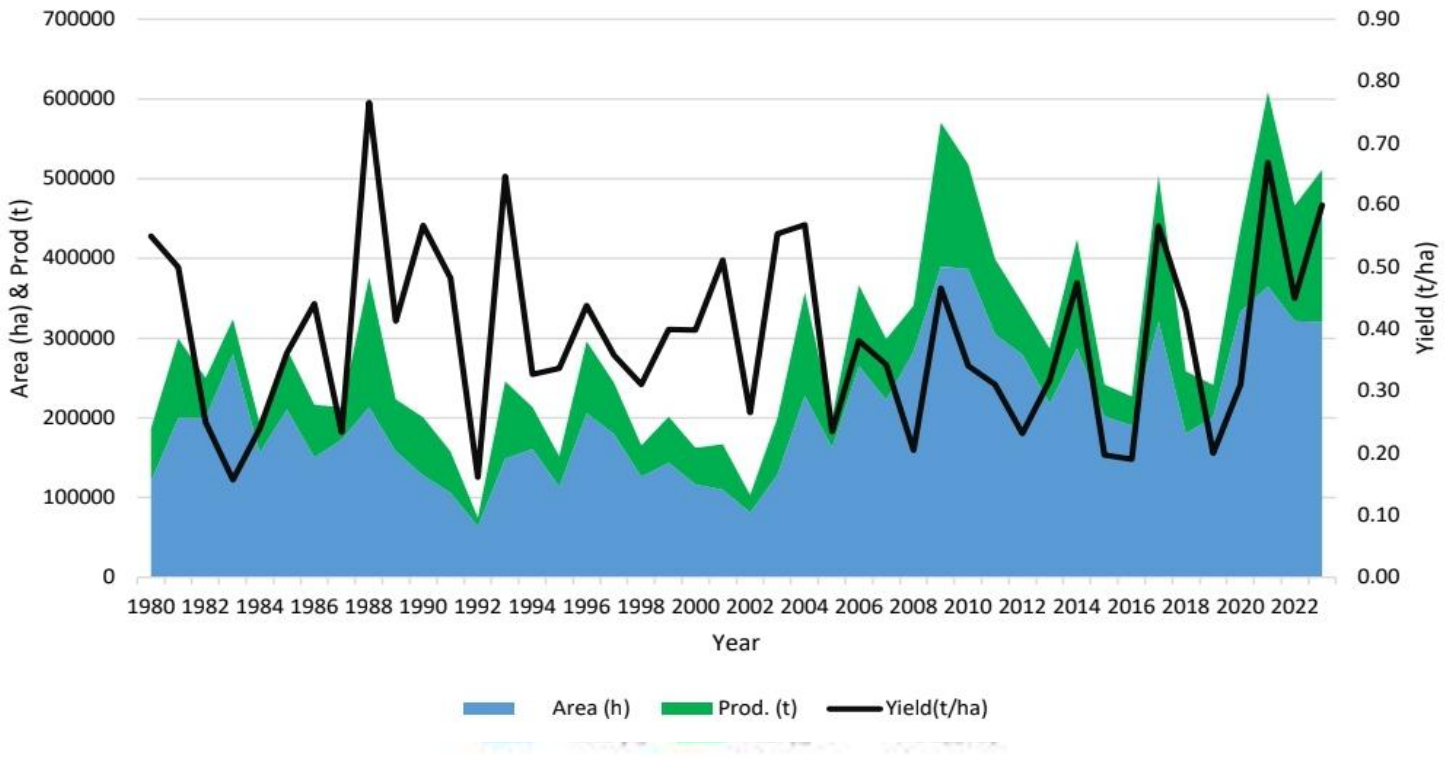
"Millets thrive in arid climatic conditions, which are characterised by harsh conditions of drought, high temperatures and poor soil nutrition. The crop is nutrient-dense and provides a cheap source of essential nutrients that are vital in human and animal diets."

Dr John Basera, the secretary for Agriculture, speaks about small grains at a field day at Icrisat in Matobo. Picture: Brezh Malaba.

Small grains production
The Zimbabwean government's 2023 Crop, Livestock and Fisheries Assessment Report (see graph below) shows that sorghum production was projected at 191 125 metric tonnes (MT) in the 2022-2023 summer cropping season, which is 32% more than the 144 633MT produced in 2021-2022.

Sorghum production trends

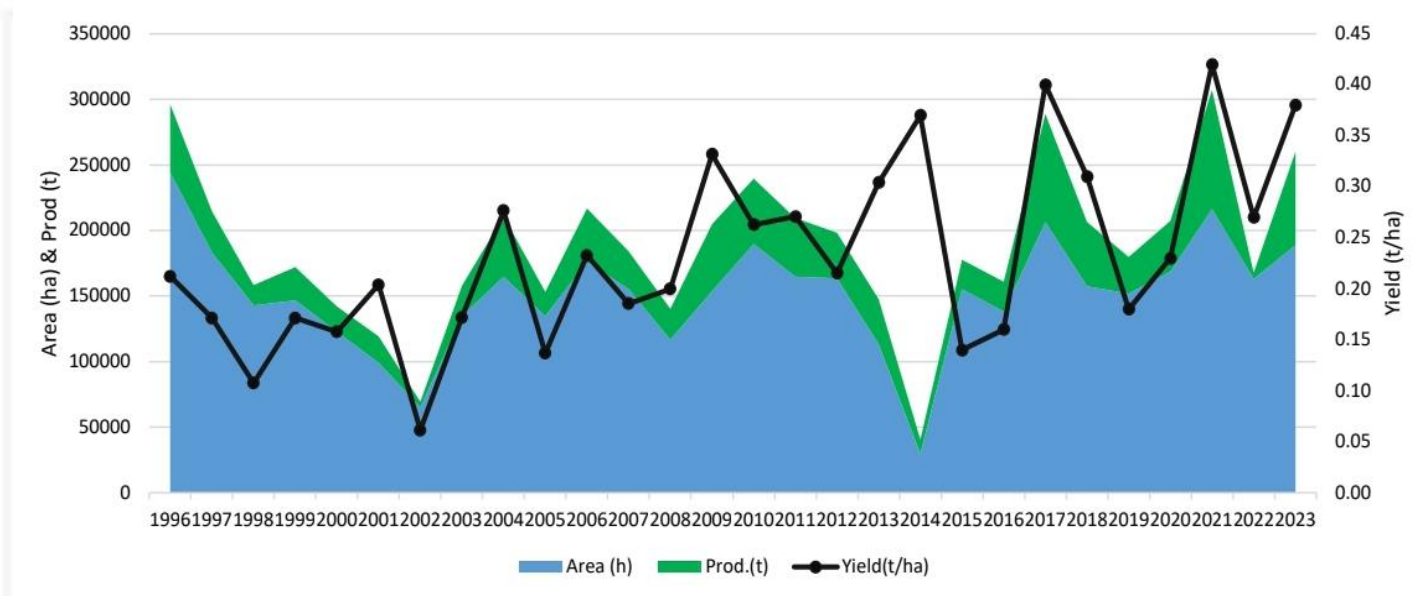
There is an increase in sorghum production, especially in drier regions, due to agricultural input distribution based on agro ecological matching.



Millet production in 2022-2023 is estimated at 280 966MT, which is 45% more than the 194 100MT produced in 2021-2022. Pearl millet production in 2022-2023 is expected to be at 71 221MT, which is 61% more than the 44 143MT produced in 2021-2022 (see graph below).

Pearl millet production trends

There is a general increase in pearl millet productivity.



Finger millet production in 2022-2023 is projected at 18 610MT, which is a 250% increase from 5 321MT produced in the 2021-2022 season (see graph below).

Finger millet production trends

- For the past 20 years there has been an increase in finger millet production in Zimbabwe.
- There is also general improvement in finger millet yield.

Crop productivity challenge

Ramping up the crop yield in the small grains sector should be a top priority, says Basera. "There is need to move up the average productivity level from the current 0.5 tonnes per hectare to a level of between 0.8 and 1 tonne per hectare. The transition should be predicated on a robust, responsive extension delivery system so that we bridge the gap between research trial results and what farmers are achieving. Research results are between 3.5 tonnes and 4 tonnes per hectare whilst farmers are averaging around 0.5 tonne per hectare."

Small grains offer significant economic benefits that cannot be overlooked. Maize production often demands substantial inputs, including fertilizers, pesticides, and water, which may be unaffordable for resource-constrained farmers. Conversely, small grains are known for their adaptability, requiring fewer inputs for cultivation. Farmers can cultivate small grains with minimal financial outlay.

The International Crops Research Institute for Semi-Arid Tropics (Icrisat), which runs Matobo Research Centre south of Bulawayo, has taken a lead in improving sorghum and millet production. Icrisat views food security through the lens of resilience.

At the research centre-located at the foot of the picturesque Matobo Hills, a World Heritage Site-we interviewed plant geneticists, agronomists and other specialists.

Dr Martin Moyo, the director and principal scientist at Icrisat, said the research centre has generated 55 new varieties of sorghum and pearl millet. The institute's foundational task was to devise practical ways of drought-proofing agriculture, not only in Zimbabwe which has 15 million people but also in the entire southern African region, whose total population is 380 million.

"In our research, we focus on six crops. We focus on sorghum, pearl millet, finger millet, groundnut, pigeon pea and chick pea. These are crops that are very relevant to the dryland, semi-arid areas. In terms of climate-proofing our agriculture, we believe these crops stand a better chance of surviving the harshest conditions."

Moyo variously described small grains as "future grains" or "smart foods" or "nutri cereals".

"Why smart foods? They're smart in that they're good for us, from a nutritional perspective and other factors."

He is convinced that small grains will give the country a fighting chance against the climate crisis.

"If we're talking about climate change, we have to be talking about these drought-tolerant crops and varieties. Climate change is going to force us into growing these crops; if we're not shifting, then we're dying."

Policy interventions by the government should focus on developing a vibrant market for small grains.

"What drives a farmer is not just the food security; it's also the income. So, we should be able to establish markets. Our agriculture should be market driven. Once farmers are earning an income, they will be able to re-invest," said Moyo.

Access to financing is a major drawback for most farmers.

"Access to financial services is a big issue within the country. Financial institutions have to see the potential of the smallholder farmers. It's really difficult for farmers to access inputs and technology, for example. We have to really step up. It's one of the main issues that we have to be talking about in any agricultural dialogue."

Over the years, some sorghum growers have signed contracts with Delta Beverages, which uses the crop in brewing traditional beer. But the commercial value proposition must now expand to promote small grains as a better staple food than maize.

Icrisat has 78 hectares of land, donated by the government of Zimbabwe. The epic irony is that some of this enchanting land—replete with majestic hills, gravity-defying granite boulders and teeming with wildlife—once belonged to the notorious British colonialist, Cecil John Rhodes, who lies buried in these mystical hills. Today, this sacred land plays a crucial role in preserving the ancient secrets of African food security for posterity.

Icrisat Matobo director and principal scientist Dr Martin Moyo (left) shares notes with secretary for Agriculture Dr John Basera. Picture: Brezh Malaba.

Icrisat operates the Matobo Regional Gene Bank, whose expertly calibrated refrigeration facility can store seed for up to 50 years. Seed dating back to Zimbabwe's pre-independence era is still available. This is how committed the scientists are. The gene bank serves East and southern Africa.

Tanyaradzwa Tenesi (pictured), a research technician at Icrisat, said the gene bank has 10 600 accessions in storage and 2 018 accessions in the field. An accession is a distinct, uniquely identifiable sample of seeds representing a cultivar, breeding line or a population, which is maintained in storage for conservation and use.

Tanyaradzwa Tenesi, a research technician at Icrisat, says the Matobo Regional Gene Bank is a massive resource enabling farmers to improve crop production and yield. Picture: Brezh Malaba.

The African value proposition

Dr Justify Shava, the head of the Southern African Development Community (SADC) Plant Genetic Resources Centre (SPGRC), accompanied The NewsHawks on a tour of the Matobo Regional Gene Bank near Bulawayo.

Shava said the Sadc Gene Bank—based in Lusaka, Zambia—focuses on co-ordinating and promoting plant genetic resources.

"We are targeting crop species that are indigenous to southern Africa. We keep plants like small grains—the sorghum, the millet—we're promoting their adoption as a core for food security for the region. Apart from that promotion in the member states, which works through national programmes, we also keep material at the regional gene bank, the SPGRC."

The SADC Gene Bank in Lusaka, founded in 1989, operates as part of a network of scientific researchers. One of the more recent projects of the institute involved the repatriation of crop genetic material to Zimbabwe, Mozambique and Malawi in the wake of the devastating Cyclone Idai.

The cyclone, whose fury was of biblical proportions, unleashed destruction which left farmers without seed. In the blink of an eye, the farmers lost vast quantities of seed and this could have spawned yet another disaster—food insecurity—if the seed specialists had not swiftly stepped up to the plate by taking seed from the gene bank and distributing it to farmers.

"Under those circumstances, we come in handy as the Sadc Gene Bank," said Shava

Dr Justify Shava (left), the head of the Lusaka-based Sadc Gene Bank, is taken on a tour of the Icrisat Matobo Regional Gene Bank, near Bulawayo, by research technician Tanyaradzwa Tenesi (right). Picture: Brezh Malaba.

Nutri cereals are superior to maize

Shava noted that there are many factors contributing to people's general reluctance to replace maize with small grains in their diets.

"There is some influence coming from what I would term the Westernisation of our lifestyles. It looks like most people, especially the young generation, they think that it's kind of backward to be eating small grains. But I tell you, the small grains are actually the most nutritious type of food that any human being can be eating, especially us in southern Africa, given that the small grains are widely available.
"These days we're talking of health challenges to do with obesity. We're promoting these small grains as they help people to overcome those challenges. So, the main reason why people are not eating these small grains is that some people think this type of food is quite inferior. It's really a lack of awareness."

Shava says apart from Namibia and Botswana which are doing relatively well in promoting the consumption of small grains, the rest of the Sadc region still has a long way to go in changing people's perception and attitudes towards sorghum and millet.

"Governments are already doing a lot in coming up with policies that promote the growing of small grains. The biggest challenge is that there's no awareness promotion...to ensure that small grains are adopted and are eaten with confidence. That's what is needed. The policy frameworks are there; now we need practical action."

conclusion

How can African farmers make small grains commercially viable and sustainable? There are several low-hanging fruits:

1. Market development: Developing markets, promoting small grains to consumers and connecting farmers with processing companies is key to making small grains commercially viable.

2. Farming techniques: Small grains require different farming techniques than traditional crops, so it is essential to provide farmers with training on concepts like crop rotation and soil management.

3. Government support: Public policies can make a huge difference in promoting small grains production. Policymakers should be actively crafting measures to introduce subsidies, provide financing for smallholder farmers and craft policies that support sustainable farming practices.

4. Research and development: Continued research and development—as shown by the work done by Icrisat in Matobo, the SADC Gene Bank and other institutes—can lead to the creation of new and improved small grain varieties that are more disease-resistant, higher yielding, and better adapted to local growing conditions.

5. Value addition: Adding value to small grains through processing, packaging, and branding can create new markets and increase revenue streams for farmers.

6. Knowledge sharing: Finally, knowledge sharing is essential to making small grains commercially viable and sustainable. Farmers should have opportunities to learn from each other, share experiences, and collaborate to further community development.

There are glimmers of hope. The Zimbabwe Merchantile Exchange (ZMX) is promising to become an innovative platform enabling commodity holders to deposit their commodity at designated warehouses in exchange for a warehouse receipt. The receipt is a negotiable instrument that can be used as collateral for credit facilities or can be used as an instrument of exchange in commodities spot market trading. Nothing should stop sorghum and millet growers from staking their claim in the food chain.

By implementing these and other strategies, farmers in Zimbabwe and wider Africa can make small grains commercially viable and sustainable, improve their livelihoods, and contribute to socio-economic development.

Credits

This work was conceived and created by Brezh Malaba, Bertha Challenge Fellow 2023, with the support of the Bertha Foundation and produced by The NewsHawks, Pictures by Brezh Malaba, Designed by Tapiwa Nyakabau.