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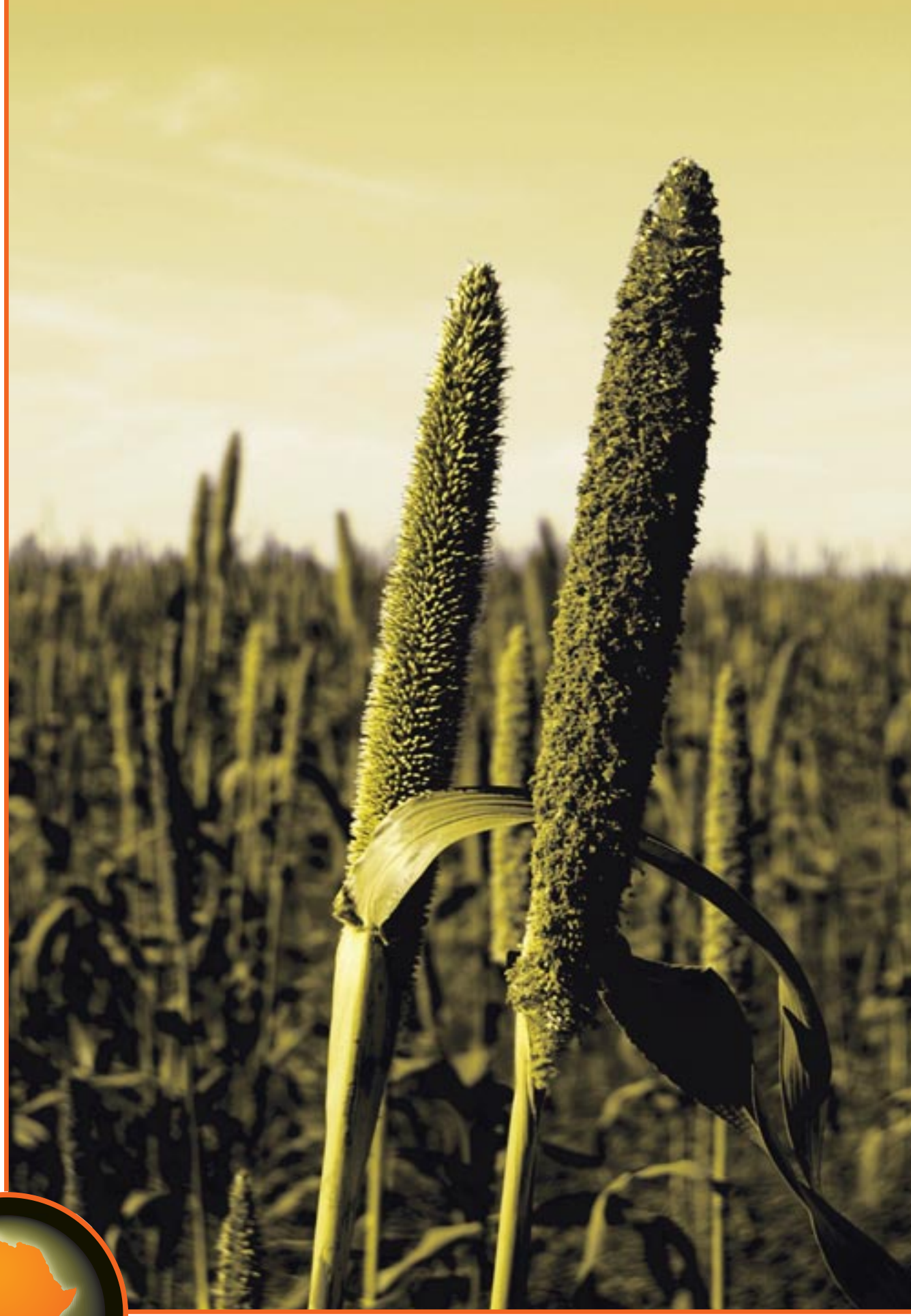

FEEDING FIVE THOUSAND

The case for indigenous crops, in Zimbabwe

By Paul Chidara Muchineripi

The Author

Paul Chidara Muchineripi is a management consultant with over 25 years' experience. He runs his own consultancy firm in Harare, where he lives with his wife and two youngest children.

Chidara was born in the Gutu district of Masvingo province in southern Zimbabwe, where he lived with his family until he completed his primary education. Following the death of his father, Chidara was employed as a house worker for a colonial police officer. He achieved O-level and A-level qualifications largely through self-education and distance learning. In 1972, he gained a diploma in agricultural support and subsequently spent six years training agricultural extension workers.

In 1979, Chidara enrolled in the University of Rhodesia to study for a bachelor of administration degree. He graduated with honours in 1981, shortly after Zimbabwe's independence. He spent six years at Anglo American, the resources and mining conglomerate, and 14 years at Astra Corporation, the construction and manufacturing group. In 2001, he set up Business Training and Development, a consultancy. His clients include construction, mining, food manufacturing and motor vehicle companies in Zimbabwe.

Chidara is the head of Tavengwa village and next-in-line for the paramount chieftainship of Gutu. In 2005, he established the Chinyika Communities Development Project to encourage seven villages to grow indigenous crops, predominantly finger millet. The project aims to overcome problems associated with growing commercial crops, notably maize, in regions with low rainfall.

The Policy Voices Series

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Acknowledgements

The author wishes to acknowledge the support and encouragement of Professor Ronnie Lessem. This project would not have been possible without the assistance of Phillip Chigumira and Steve Kada at Cairns Foods. Research and editing was by Jonathan Bhalla. Cover image by Krishna Stott. Design by Amanda Costikyan Jones. Africa Research Institute would like to acknowledge the generous assistance of Richard Smith.

Published by Africa Research Institute, 2008
ISBN No. 978 1 906329 03 7

Africa Research Institute

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Foreword

About two thirds of Africa's population depend for their livelihood on primary crops. Agriculture is the continent's largest economic sector, far bigger than banking, brewing, mining or telecoms – all industries propelled by innovation and investment. Yet in the most important sector of all, agriculture, productivity has lagged. Small farmers, largely because they are highly vulnerable, can be stubbornly resistant to change.

Governments have not helped them enough. Too often, earnings from agriculture have underwritten other economic ambitions. Industrial policy has trumped the interests of farmers, as state resources were diverted to fund the needs of exporters and urban economies. Nor has the international community done better. The tally of donor assistance for African agriculture has fallen by half since the era of Economic Structural Adjustment in the late 1980s.

Zimbabwe was, for some time, an exception. In the first decade of independence, President Robert Mugabe's government made substantial progress in supplying essential inputs to small farmers. "No African president did more," recalls Professor Lovemore Mbigi, a Zimbabwean at Rhodes University in South Africa. Alas, that early legacy has been undone. Small farmers have watched helplessly as systems for distributing seeds, fertiliser and expertise have been destroyed by the ongoing crisis.

In December 2008, fearful of a cholera epidemic, the government of Zimbabwe belatedly declared a state of emergency. Already, an estimated five million people need international food aid. Their prospects will not improve unless the agricultural economy can be rehabilitated. Small farmers need to be helped to become net producers of food, reversing a trend which has seen rural communities become net consumers of their own staple crops.

A persistent, underlying problem has been the failure to adapt the structures of a colonial economy to serve the larger needs of most rural populations. As the infrastructure which sustained large-scale commercial farming has broken down in Zimbabwe, small farmers have been direct casualties. Their dependence on markets, methods and systems which date from the mid-twentieth century, is common to many small farmers across Africa.

Tradition has a part to play in addressing this problem. In the southern district of Gutu, in the province of Masvingo, rural villagers have been spared the spectre of famine – largely thanks to the vision, research and inclusive leadership of Chidara Muchineripi. A Harare businessman, and next-in-line for the paramount chieftainship of Gutu, he believes strongly that indigenous knowledge systems must be allowed a role in Africa's development.

The case is convincing, although such arguments are often misunderstood. Agriculture is emotive terrain and rural livelihoods are fertile territory for a phoney sentimentality – to which foreigners can be especially prone. To this day, smiling African farmers feature disproportionately in western advertisements for 'Fair Trade' coffee and cocoa. Regrettably, such schemes are still concentrated overwhelmingly in South America, not sub-Saharan Africa.

Encouraged by Chidara Muchineripi, villagers in Gutu decided to plant finger millet, a neglected indigenous crop. Older people were initially reluctant, on the grounds that ancestral spirits had been disrespected when farmers abandoned the traditional crop in favour of maize. Younger farmers favoured the established cash crop, and often identified maize as emblematic of prosperity. Today, thanks to modern and more intensive farming techniques, families in Gutu possess adequate stocks of finger millet to feed about five thousand villagers.

The crux of the argument in these pages is that tradition has potential to foster innovation. Finger millet is better suited than maize to areas of low rainfall, requires fewer expensive inputs and can be stored for longer periods. A

study by the ministry of agriculture found levels of calcium, carbohydrate and iron in finger millet to be higher than maize. Other indigenous crops such as sorghum and pearl millet score still higher for nutritional content.

Families in Gutu have recovered forgotten skills in preparing, cooking and storing finger millet. Its grain can be ground for *sadza*, a thick porridge; fermented into beer, traditionally offered to appease local ancestors; or made into a sweet non-alcoholic drink. The newfound confidence of Gutu's farmers has enabled them to negotiate directly with agro-processors, creating a new cash market for the surplus crop.

In the distant world of government and international policy, much can be learned from Gutu. Promises of help for small farmers will ring hollow until the leading agencies abandon their lingering suspicion of state subsidies - properly and transparently administered - for key agricultural inputs. Chidara Muchineripi is surely right that momentum for rehabilitating African agriculture cannot come from abroad: the most important decisions are made on the ground. It follows that anyone trying to help should listen first to indigenous ideas.

Mark Ashurst
Director, Africa Research Institute

1. My family and childhood

I was born in the village of Tavengwa just outside the Chinyika township in the area of Chitsa, in the Gutu district of Masvingo province. I had a rural upbringing, spending much of my early childhood on my father's farm. In 1979, I moved to Harare where I have worked as a management consultant for the past 25 years.

My great grandfather was the first paramount chief of Gutu. He had four children: Chomutwiti, Muchineripi, Chaurura and Chingombe. My father had eight siblings, all of whom had children. I myself have 25 brothers and sisters. A majority of my extended family still lives in Gutu district. I remain in regular contact with many of them and often send money back in times of hardship.

When I was born on December 29th 1947, my father Paul Tsiwi Muchineripi was the paramount chief of Gutu district. The paramount chieftainship is the highest traditional authority in Gutu, and rotates between these four households.

My father became disillusioned with his role as paramount chief. By the late 1940s, colonial authorities had taken away many of the powers traditionally associated with his position. Most African land was transferred to state ownership. My father believed that the chieftainship had lost many of its traditional functions, becoming an instrument to serve the colonial administration. He made the decision to pass the chieftainship on to his brother, but retained an advisory role.

My father became a farmer when I was two years old. He enrolled in the 'Master Farmer' training scheme at Alford Farmer Training Centre in Gutu, a requirement for him to qualify to buy a plot of land in an African purchase area. On completion of his one-year training course, my father bought Farm Number 54, a 1000-hectare plot in Nyazvidzi purchase area. He grew maize and a number of indigenous crops. Growing up in Gutu, my family never experienced shortages of food. We always had enough crops to feed our large extended family, and a surplus of grain to exchange for cattle.

The current situation of persistent food shortages in Zimbabwe is in stark contrast to my childhood. Today, people in Gutu regularly experience food shortages caused by low rainfall and drought. Rural families struggle to cope with the environment in Gutu.

My father's legacy has taught me to respect both modern and traditional knowledge as a means for progress. He often told me about the importance of our cultural heritage. His achievements as a paramount chief and a farmer were grounded in our culture and traditions. He also stressed the importance of education, encouraging me to pursue my education over money and resources. I remember him telling me, "Education in your brain is yours and nobody can touch it." The farming methods which he had learned during his agricultural training course were crucial to his success as a farmer.

Poverty in Gutu is a direct result of food shortages. Self-sufficiency in food offers hope to escape poverty and a basis for economic development in Gutu. Social and economic change must come from within and cannot be reliant on external donors. Zimbabwe's recent dependence on western-based charities has done little to alleviate poverty in Gutu.

2. Life in Masvingo

Masvingo is the most densely populated province in Zimbabwe, inhabited largely by Shona-speaking peoples. During the 1980s, the population of Masvingo was home to the best-educated people in the entire country. The province has the highest number of primary schools in the country and a literacy rate above 90%. But the lack of opportunities to earn a steady income has led many of the most educated people to leave for urban centres or abroad in search of employment.

There are very few mining or manufacturing companies operating in the province. The biggest employers are the sugar plantations in the lower areas of Masvingo, owned by Anglo American, the natural resources group, and Tongaat Hulett, an agro-processing business. Subsistence farming and cattle-ranching are the dominant livelihoods.

Gutu is the most northerly district in the southern province of Masvingo. The weather is hot and dry throughout most of the year and prone to drought with some of the lowest rainfall in the country, usually 400-600mm per year.

Maize is the staple crop in Masvingo, but good harvests require high volumes of rainfall. Low rainfall makes the province ill-suited to growing maize. Commercial agriculture has been the main driver of economic growth in Zimbabwe since independence, but the dry climate in Masvingo is not suitable for large-scale agriculture. Food shortages are common.

3. The legacy in Gutu

Colonial agricultural policy stifled the production of indigenous crops in Zimbabwe. From the late 1920s, there was a steady shift away from growing indigenous crops to the production of commercial or 'cash crops'. Subsidies and agricultural support services were targeted at large commercial farms. Government marketing boards controlled the purchase and sale of all agricultural commodities, creating an effective monopoly of markets for maize, cotton, sunflower and tobacco.

The high demand from world markets and urban centres was an incentive for the colonial administration to encourage the production of commercial crops. Authorities were keen to establish an agricultural economy that would provide a reliable source of revenue to support development of manufacturing industries. Revenues from agricultural commodities were directed to modernise the predominantly urban industrial economy.

Agriculture and Colonialism
Key Dates

1930: *The Land Apportionment Act (LLA)* formalised a process already underway of segregating agricultural land by racial groups. White-owned estates increased in numbers and size to cover 50% of agricultural land, in the most fertile regions of the country. A majority of the rural African population were confined to 'native reserves', occupying 21% of agricultural land. Under the LLA, Africans could buy plots in designated African Purchase Lands (APL), which made up 7% of agricultural land.

1936: *The Maize Control Act (MCA)* introduced a dual pricing system for maize, paying higher prices to white farmers for their maize crop than to African farmers. The act allowed the state to subsidise white farmers, while also ensuring a cheap supply of food for cattle ranchers, tobacco farmers and mining companies.

1940: New legislation allowed private traders authorised by the Grain Marketing Board (GMB) to purchase maize directly from African farmers. Native reserves were located in remote parts of the country, far from marketing centres. African farmers often sold to private traders. The limited number of approved buyers increased the bargaining power of traders. Smallholders' crops were often sold below the minimum price stipulated by law.

1949: A 10% marketing levy was introduced on all produce originating from African farms, to increase state revenues.

1951: *The Land Husbandry Act (LHA)* divided the African population into two categories: 'farmer' and 'non-farmer'. Small plots of land were allocated to 'farmers' in the native reserves. Those farmers temporarily working in towns or on commercial farms were placed in the non-farmer category, and were denied access to agricultural land.

1966: The 10% marketing levy was lifted in APLs but maintained in native reserves.

1966: *The Grain Marketing Act (GMA)* divided the maize industry in two. White farmers were legally required to sell their produce to the GMB. Africans were allowed to trade without restriction within native reserves. In order to sell outside native reserves, African farmers were required to sell directly to the GMB, at a fixed price below that on offer to white farmers.

1969: *The Land Tenure Act (LTA)*, which replaced the LAA of 1930, permanently legalised the division of land. Of 33m hectares of land available for agriculture, white farmers were allocated 46.9%. The majority of Africans were allocated plots in 165 Tribal Trust Lands, covering 46.9% of land. APLs covered the remaining 4.5% of land.

Sources: Stoneman, C., "Agriculture", in *Zimbabwe's Inheritance*, Stoneman, C., (ed) 1981, (Macmillan).
Amin, N., *Maize Production, Distribution Policy and the Problem of Food Security in Zimbabwe's Communal Areas*, Development Policy and Practice working paper No.11, 1998, (Open University).

Prior to 1951, rural communities in Gutu practised a rotational method of farming. They would clear a piece of land, grow crops for several years until the soil became depleted, then move to a fresh plot of land for the next harvest. Previously farmed land would be left fallow until vegetation recovered and nutrients were restored to the soil.

Colonial policies disrupted this practice. The creation of native reserves under the Land Apportionment Act increased the population density in these areas. Most African families were restricted to farming small plots between two and six acres. Overcrowding in native reserves led to over-cultivation and soil erosion.

Land degradation in many parts of Gutu is severe. Any regeneration process will take years before land becomes productive again. To attain healthy yields from maize requires high volumes of rain. Gutu is a low rainfall region. Successful maize production requires fertilisers to replenish nutrients in the soil. Fertilisers are expensive and beyond the reach of rural families in Gutu. Consequently, maize harvests are highly volatile.

Over the years, there has been a steady reduction in the average size of farms. The combination of smaller plots with the difficulties of growing maize in Gutu has created a situation where many rural communities now consume more food than they produce. Subsistence farming has become the dominant mode of agriculture in Gutu.

Traditionally, families exchanged surpluses of grain for cattle and vice versa. Artisans would exchange products made from iron for livestock. The family was itself a business unit. Today, rural populations have become net consumers of staple crops purchased from commercial wholesalers. Increased regulation of agricultural markets encouraged an assumption that traditional crops had no place in the formal economy. Where indigenous crops are found, they are grown sporadically. The majority of rural farmers no longer grow a variety of crops.

Agricultural marketing boards

Agricultural marketing boards created by colonial authorities in Africa granted the state a legal monopoly over the purchase and sale of agricultural commodities. Initially, marketing boards established control over export crops, such as coffee and tobacco. Subsequently, they expanded to monopolise staple food crops, like maize. The prices paid to farmers by marketing boards were fixed; usually well below international commodity prices. Private sector trade in agricultural commodities was suppressed.

The motivation behind the marketing boards was twofold. First, colonial authorities sought to maximise state incomes from the sale of agricultural commodities to Europe in order to stimulate the local manufacturing and industrial sectors of the economy. Second, the state sought to regulate food prices, to secure a reliable flow of cheap food to urban consumers.

Post-colonial governments maintained agricultural marketing boards. In an era of strong socialist influence in Africa, marketing boards enabled governments to cushion the volatility of international commodity prices and encourage production. At the same time, they became a convenient instrument for patronage. Donors and international financial institutions (IFI) supported the development of agricultural marketing boards. During the 1960s and 1970s, they were viewed by the World Bank as a legitimate instrument to mobilise public sector revenues, in order to modernise and diversify under-developed economies.

The role of marketing boards was expanded to include the provision of farm subsidies, credit, and strategic food reserves for emergencies. Huge inefficiencies meant that marketing boards quickly became financially unsustainable. The international debt crisis in the early 1980s prompted a shift in donors' attitudes towards marketing boards. IFIs promoted a set of reform packages aimed at removing state interference from the agricultural sector, largely through the elimination of price controls and the privatisation of government marketing boards. The reforms did not have the intended results: per capita agricultural production has declined since 1980.

Marketing boards still exist in a number of African countries, although their responsibilities have been rolled back. Monopoly powers have been lifted, and marketing and processing functions privatised. Today, marketing boards focus on the provision of 'public goods', such as strategic grain reserves and insurance against irregular price fluctuations.

Sources: Barrett, C. B and Mutambatsere, E., "Marketing Boards", in *The New Palgrave Dictionary of Economics, 2nd Edition*, Blume, L. E. and Darlauf, S. N., (eds) 2005, (Palgrave).
Cabral, L and Scoones, I. *Narratives of Agricultural Policy in Africa: What Role for Ministries of Agriculture*, 2006, (Future Agricultures).
Lele, U and Christiansen, R. E. *Markets, Marketing Boards and Cooperatives in Africa, in Africa, Issues in Adjustment Policy*, MAIDA discussion paper 11, 1989, (World Bank).

4. My responsibility

Today, I am the eldest surviving son of my father's 26 children. I live in Harare and run my own management consultancy business. In 1996, I became the head of my home village of Tavengwa among the Chinyika communities. In 2005, I discovered that I was next-in-line for the paramount chieftainship of Gutu district. To be considered for the chieftainship is the highest honour in Gutu, and I am aware that with this title come huge responsibilities.

When I discovered I was next-in-line for the chieftainship, I felt a strong desire to give something back to my people. I am considered to be one of the leaders in Gutu, which brings a responsibility to assist my community in times of hardship. I was aware that people in Gutu regularly experienced shortages of food, so I decided that this is where my energies should be focused.

In 2004-2005, Gutu experienced a severe drought. Rainfall for the entire agricultural season was only 400mm. Average rainfall in Gutu, ranging between 400-600mm per year. Less than 400mm is not adequate to sustain a good maize harvest. In the wake of widespread crop failure, rural families lost almost half of their cattle herds. Aid agencies responded slowly and were unable to reach the worst-affected communities.

The drought was particularly severe in my home village of Tavengwa. I was able to acquire five tonnes of maize from northern Zimbabwe and arrange transport to the Chinyika communities. I provided one 50kg bag of maize for each family in two villages, enough to feed them for two months. My family and I paid for the maize and the transport to the Chinyika communities.

The drought highlighted the reality of food insecurity in Gutu. My response was a temporary solution, and exposed the wider systemic problem. In short, how do you achieve sustainable food security in a region that is prone to low rainfall and drought? I realised that I needed to do more in order to find a long term solution to this recurrent problem.

Finger millet, a risk analysis

Advantages

Finger millet is an important crop in many parts of eastern and southern Africa. It has several merits for rural communities. Finger millet is highly nutritious, containing high levels of amino acids absent in most staple cereal crops. High levels of iron and micronutrients mean it is an ideal food for diabetics, the elderly, and people with HIV. As a small grain, finger millet is naturally resistant to insects and pests when stored. Finger millet is a versatile crop. It can be processed to make flour, cakes, biscuits and bread. In summary:

- High nutritional value: contains 40 times more calcium than maize
- High levels of amino acids
- Adapts well to variations in climate and rainfall; can thrive in poor soils with limited moisture
- Storage: can be stored for up to 30 years
- Higher market value than other cereals, including maize
- High productivity: new seed varieties more than double crop yields
- Increased demand for processed finger millet products
- Potable: can be fermented into beer, or made into a sweet non-alcoholic drink

Disadvantages

Finger millet can also be problematic. Yields can often be poor. Finger millet is vulnerable to blast disease, a parasitic fungus that can reduce yields by up to 50%. Preparation can be time consuming, requiring extra effort to remove the grain from the husk compared with maize. Small farmers often depend on local seed varieties that produce poor quality grains and lower yields per hectare than maize. In summary:

- Highly susceptible to blast disease
- Labour intensive: weeding up to four times per harvest can be necessary for a good yield
- Vulnerable to pests while growing: birds, grasshoppers and armyworms reduce crop yields
- Local seed varieties are less productive
- High-yielding seed varieties are not widely available to smallholder farmers
- Declining land fertility in semi-arid regions reduces crop yields

Source: Mgonja, M.A., Lenné J.M., Manyasa, E. and Sreenivasaprasad, S., (eds.) *Finger Millet Blast Management in East Africa. Creating opportunities for improving production and utilization of finger millet,* 2007, (International Crops Research Institute for the Semi-Arid Tropics).

In late 2005, motivated by the experience of drought in Gutu, I enrolled on an MSc in Social and Economic

Transformation at CIDA City Campus, a non-profit higher education institution in Johannesburg. The course was run in conjunction with the University of Buckingham and a Geneva-based think-tank, Trans4m. I was fortunate to receive funding from the Kellogg Foundation to pay tuition fees and flights to Johannesburg.

The course emphasised the importance of local knowledge in the process of social and economic change. Donors and development agencies tend to neglect local knowledge when designing programmes and responses to crises. All societies have a wealth of knowledge that is specific to their history and experiences. By understanding local cultures and engaging with traditional knowledge, we are able to gain a better understanding of local needs.

The central message was that for traditional knowledge to develop and have relevance for current generations, we must engage with knowledge from other cultures and societies. I felt encouraged to combine traditional knowledge with modern innovations.

5. Lessons from my childhood

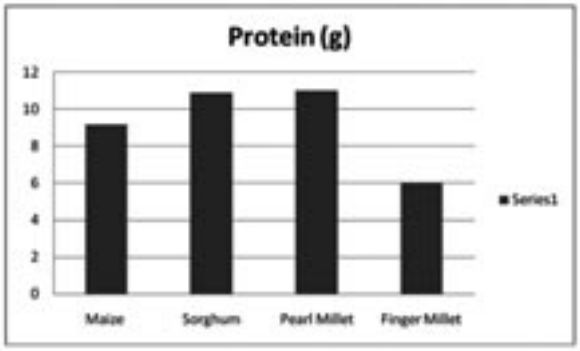
The course prompted me to reflect on my childhood, when my family grew a variety of crops, most of which were indigenous to Gutu. These traditional crops were far more resilient in times of low rainfall and were an important source of food for our large extended family.

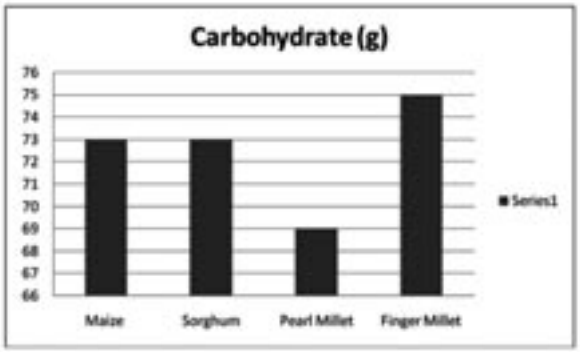
Today, most farmers in Gutu grow maize. I began to think that growing traditional crops, rather than maize, could help the people of Gutu to overcome the problem of food shortages. A number of crops are indigenous to Gutu, including pearl millet, finger millet, and sorghum. The primary indigenous crop grown by my father was finger millet, because of its resilience and versatility. I realised that rediscovering indigenous crops could assist the Chinyika communities to address food shortages.

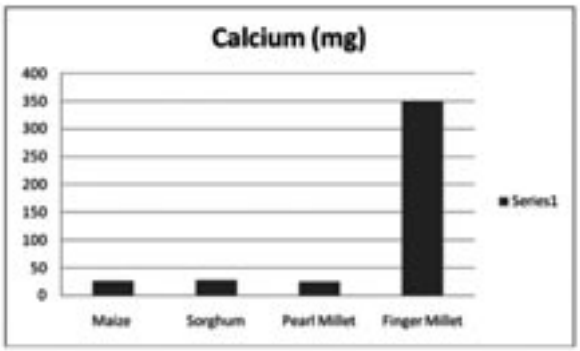
Finger millet is one of the main indigenous crops in Gutu. It does not require high volumes of rainfall and is less demanding of nutrients from the soil than maize. The use of cattle manure as a fertiliser is very effective at

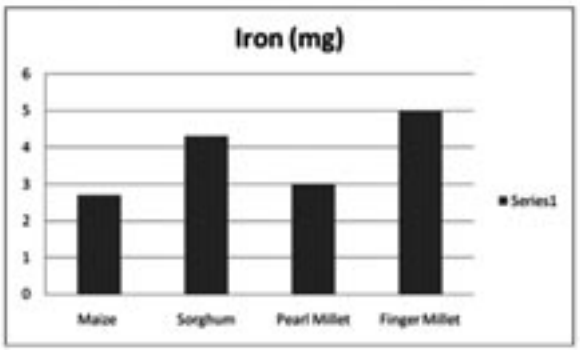
Nutritional value of indigenous crops

Nutrients in 100-g edible protein of cereals at 12% moisture









Source: Ministry of Agriculture, Zimbabwe, 1995.

increasing yields. Finger millet is a small grain, naturally resistant to weevils when stored. It is an especially durable grain, which can be stored for up to 30 years.

Traditionally, finger millet served several functions for the people of Gutu. Most commonly, it is ground into a powder, for *sadza*, a thick porridge eaten as a main meal. On special occasions, finger millet is fermented and made into traditional beer to appease the ancestral spirits. It can also be made into a sweet non-alcoholic drink which is drunk after meals.

Indigenous crops are highly nutritious - in some cases more than maize. A study by the ministry of agriculture in 1995 found that finger millet is higher in calcium, carbohydrate and iron than maize. Pearl millet and sorghum have also been found to have higher levels of protein than maize.

Crop Productivity in Zimbabwe
Sorghum and Millet versus Maize

During the 1980s, food shortages in semi-arid regions of Zimbabwe prompted the government to promote drought-resistant small grains among smallholder farmers. In 1984, sorghum, pearl millet and finger millet were reclassified as 'controlled crops' eligible for sale to the Grain Marketing Board (GMB). Official prices of small grains were set favourably in comparison to maize, in the hope that this would boost production.

In the early 1990s, a study at the University of Hohenheim in Germany, using datasets from 200 household surveys, was conducted into small grain production in four areas in western Zimbabwe: Ramakwebane, Mazvibwa, Nata and Semukwe. The study found small grains performed poorly against maize in terms of yield productivity, even in years of below average rainfall. Improved hybrid maize varieties outperformed traditional pearl millet and sorghum varieties by 8%, contradicting the common assumption that small grains grow better in semi-arid areas than maize.

However, the study argued these results reflect decades of research dedicated to developing new maize seed varieties, and a paucity of research on white sorghum and millets. In terms of labour productivity and profit margins per labour hour, pearl millet and sorghum outperformed maize in three of the four study areas.

Source: Hedden-Dunkhorst, B., *The Contribution of Sorghum and Millet versus Maize to Food-Security in Semi-Arid Zimbabwe*, 1993, (Wissenschaftsverlag Vauk Kiel).

6. Chinyika Communities Development Project

Whilst studying for my master's degree, I tried to relate what I learned to my home area in Gutu. I wanted to be able to apply knowledge acquired in Johannesburg to the situation in Gutu, in order to find a way of tackling food shortages.

In 2005, I founded the Chinyika Communities Development Project (CCDP) aimed at addressing food shortages in Gutu. For the CCDP to be sustainable in the long term, I was aware that it could not be reliant on large external inputs.

Donor-driven development projects in Zimbabwe have relied heavily on external resources and expertise from western countries. Ordinary Zimbabweans rarely have a say in the design of these projects. This approach initiated a 'dependency syndrome' within rural communities. People expect development to be done 'for them'. Rural development projects which originate outside Zimbabwe often lack impetus from within the community. I decided that the momentum for the CCDP had to come from within the Chinyika communities.

My aim in founding the CCDP has been to combine indigenous crops with modern farming techniques and business concepts. In Gutu, rural families are encouraged to grow three indigenous crops: finger millet, pearl millet and sorghum. I hoped that rural families would be able to increase the productivity of their land and generate a surplus of food.

The CCDP has two core aims. First, we need to address the persistent problem of food shortages. Once rural families can adequately feed themselves, they can focus on producing a surplus of food. Second, we want to develop a cash market for indigenous crops. Demand for indigenous grains from urban consumers is considerably higher than supply, representing a real market opportunity for the Chinyika communities.

The CCDP has been established to bring about social and economic change in the Chinyika communities. Each family should have food reserves for the next three to five years, with enough supplies to generate an income of US$5,000 per year. If this is sustained, sales of their produce will be sufficient to meet basic health and educational requirements.

I presented the concepts of the CCDP to a large number of villagers. Our initial discussions focused on the attitudes of the community towards growing indigenous crops. It soon became evident there were a number of obstacles that we needed to overcome if the Chinyika communities were going to revert to growing indigenous crops.

I asked them to select suitable people to represent the communities in our initial research. Seven villagers were selected; all of them mature people, between 60 and 90 years of age. They had not experienced a shortage of food over the previous five years, despite the poor weather conditions. All still grew indigenous crops and had assisted others in times of food shortage. They were regarded by the community as good farmers.

Over the past 100 years, the behaviour of rural communities has changed. Most families can no longer remember how to grow indigenous crops. The move away from maize production to growing traditional crops entails risks that many people were not willing to take. Rural families needed to be convinced that their harvest would not fail, before accepting that they would be better off growing indigenous crops.

Appetites have changed. Over the years, people have grown accustomed to eating maize. They enjoy the taste and it fills them up. The villagers were unconvinced that they would like eating indigenous crops. Many young people had never tried finger millet or pearl millet.

There is high demand for conventional crops; rural families know that there is a ready market for maize, which can be sold at a good price. When families generate a surplus of food they want to be sure they can sell their produce and make a healthy profit. Farmers were unsure that indigenous crops could offer the economic benefits associated with commercial crops. The irony is that widespread production

Indigenous crops in Kenya

In Kenya, indigenous crops are concentrated in arid and semi-arid lands (ASAL). ASALs cover approximately 80% of the land-mass and are home to around 30% of the population. The main indigenous crops are sorghum, finger and pearl millet, pigeon pea, green grams and cassava. These crops tend to produce higher yields than maize in areas with low and erratic rainfall.

The production of indigenous crops in Kenya steadily declined during the period of economic liberalisation. Obstacles to increased production of indigenous crops include:

- Seed companies have shown little interest in developing improved seed varieties, while productivity of these crops has steadily declined
- Urban consumers have a generally poor understanding of traditional crops and of their nutritional value
- Traditional crops are grown in ASALs far from urban-based wholesalers. High transportation costs and the large number of intermediaries along the supply chain has forced down farm-gate prices offered by traders
- Lack of concrete policies to support traditional crops. Policies encouraging imports of cheap food have further depressed production of traditional crops
- Funding for agricultural research and extension services has dried up since the early 1980s. Government funding allocated to agricultural research has been channelled towards high value export crops

Despite the obstacles, opportunities for increased production of traditional crops include:

- Traditional crops are well adapted to the climate in ASALs. Sorghum and millets require considerably less water than maize to maintain a high nutritional value
- The potential of sorghum and millets remain unexploited: productivity has remained low at 0.7 ton/ha for sorghum and 0.5 ton/ha for millets. New seed varieties have yield potentials between two and five ton/ha
- New funding for traditional crops. Over the past three years, the ministry of agriculture has allocated US$8.7m towards seed distribution and development of traditional crops in ASALs
- Rising consumption of traditional crops: increasingly food outlets in major towns are selling sorghum and millet porridge. Cassava and sweet potato are becoming a popular snack in cafeterias and restaurants

Source: Omiti, J. and Musyoka, P., 2008, Kenya Institute for Public Policy Research and Analysis.

of maize by smallholder farmers is the root cause of food shortages in Gutu. It was evident that in order for the CCDP to be successful, we had to address these concerns.

7. Local participation

Listening to the different obstacles made me realise the importance of engaging directly with the Chinyika communities. The CCDP had to take account of the opinions and beliefs of rural families, and actively involve them in the design of the project.

The guiding philosophy behind the Chinyika project is Participative Action Research (PAR). PAR places emphasis on developing solutions with local communities to address everyday problems. Our aim was to engage the whole community at every level of the decision-making process: to discuss their problems collectively; and agree jointly on practical solutions.

In order to overcome the obstacles it was important to ensure support from the local chief and village heads, who are highly regarded in Chinyika. They receive considerable support from the local population, but have not served the interests of the Chinyika people.

We invited the local chief and the village heads to a series of meetings at Machingambi secondary school in Gutu, with the seven farmers who assisted in our initial research. Given the poor weather conditions over the previous five years, local leaders were very open to discussing new ideas to address the problem of food shortages.

Our initial discussions revolved around the positive features of Gutu district. We established that there are good roads that connect to major cities, namely Masvingo, Gweru, Harare and Bulawayo. Gutu has a highly educated population by African standards, as most people are literate. The local business centre, schools and health clinics all have access to electricity, with good telecommunication networks.

We all agreed that food shortages are becoming more common and that the annual maize harvest is not large enough to satisfy the food requirements of the local population. I presented my idea of encouraging rural families to revert to growing traditional crops like pearl millet, finger millet and sorghum. It soon became evident that local leaders were aware of the positive features of indigenous crops: they could remember eating traditional foods when they were younger, and expressed disappointment that most farmers no longer grew such crops. We documented techniques for growing indigenous crops, and exchanged recipes for how to prepare them.

Local leaders were enthusiastic about the CCDP, but expressed concerns about how we could convince local

Minister of Agriculture
Honorable Rugare E. N. Gumbo, MP
at the Small Grains Field Day
Chinyika, Gutu
April 13th 2007

"I wish to thank the organisers of this field day for inviting my staff and me to witness this success story in growing small grains. Farmers are now heeding the call to return to our traditional roots and grow crop varieties that match our climatic conditions.

Long before the advent of colonialism, small grains constituted the staple diet for the people of Zimbabwe. These crops were well adapted to the local environment, growing in drought-prone parts of the country. The introduction of maize and its promotion by the colonial authorities resulted in small grains being relegated to the periphery of the agricultural economy. Maize crop failure has been widespread for those living in low rainfall areas.

There is a poor understanding of the benefits of growing small grains. Research and development organisations have reduced them to 'the poor man's crop'. Smallholder farmers are the backbone of our Zimbabwe's food security. They should be encouraged to grow small grains.

Once more, let me thank the organisers and the Chinyika farmers who have made this day a success. Let us all participate in the massive production of small grains."

farmers to convert from maize to indigenous crops. We agreed that the only way to convince people of the merits of growing indigenous crops would be to show them the benefits first hand. We decided to hold a field day on one of the most successful farms in the Chinyika communities.

The first field day on April 13th 2007 was attended by the minister of agriculture, Mr Rugare Gumbo, and two senior officials from his ministry. People from seven villages in the Chinyika communities came to the field day. Mrs Mlambo Junior, the owner of the farm, described her experiences of growing indigenous crops. She explained that traditional crops are easier and cheaper to grow than maize, and that healthy crop yields do not require expensive fertilisers. The guests were able to see the food reserves stored by her family, and encouraged to ask questions. We treated all the guests to traditionally prepared foods and drinks.

8. The village learning centre

The field day was successful but not every family attended, nor did it answer every concern. We decided to establish a permanent village learning centre among the Chinyika communities. The centre enables families who have heard about the CCDP to attend meetings, learn more about the project and ask questions.

The village learning centre served a number of functions. In presentations and workshops hosted by local traditional farmers, we were able to show families that indigenous crops are cheap, easy to grow, and economically viable. We were able to demonstrate simple farming techniques that could improve crop yields.

Cooking demonstrations enabled families to see how indigenous crops are prepared, and to sample different varieties of food. Traditional farmers were able to show the diverse uses of crops like finger millet, demonstrating how it can be made into a traditional beer or a non-alcoholic sweet drink.

The villagers participated in activities such as removing the husk from the finger millet grains, preparing and

Blast-resistant finger millet

Finger millet is a neglected crop. Despite its high nutritional value and yield potential, research organisations and international donors have tended to fund research into established commercial crops.

Blast disease, caused by a fungus during the growth stage, is the biggest obstacle to increased production of finger millet. From 2001-2005, the UK Department for International Development's (DFID) Crop Protection Programme (CPP) funded research projects in Kenya and Uganda.

Research objectives:
- Generate information about finger millet production in East Africa
- Increase knowledge and awareness about blast disease
- Develop blast-resistant seed varieties
- Develop and promote blast disease management strategies
- Improve links between farmers and agro-food processors

Demand for finger millet in East Africa exceeds supply. Increased production of finger millet will require productive seed varieties, improved farming techniques, and partnerships between producers and agro-processors. Small farmers must be able to ensure a regular supply of high quality grain to meet growing demand.

Notable outcomes:
- Baseline data on prevalence of blast disease, farmers' understanding of blast disease and current management strategies
- Identification of several high-yielding blast-resistant seed varieties
- Dissemination of improved seeds to targeted groups
- Field days held to demonstrate the potential of improved seed varieties in terms of resistance to blast disease, high yields and grain quality
- New agronomic practices to improve yield productivity, including row-farming and post-harvest grain management
- Farmer awareness of blast disease and management techniques increased through the dissemination of leaflets and direct interaction with research staff
- New links to grain processing industry

Source: Mgonja, M.A., Lenné J.M., Manyasa, E. and Sreenivasaprasad, S., (eds.) *Finger Millet Blast Management in East Africa. Creating opportunities for improving production and utilization of finger millet,* 2007, (International Crops Research Institute for the Semi-Arid Tropics).

tasting traditional foods. They were able to criticise each other's techniques and make recommendations for improvement. The centre has held a number of tasting sessions. People were very forthcoming about their preferences for how the food should be prepared.

The village learning centre played a crucial role in unlocking the creativity of the communities. It directly involved local people in the project. By encouraging participation in such activities, they were able to develop practical solutions to everyday problems.

9. New cash crops

A further problem that we needed to address was marketability. In short, how do we link the Chinyika communities with urban markets so they can generate an income from the sale of their surplus grain? I decided to approach Steve Kada, a long-time friend and director of Cairns Foods, an agricultural wholesaler based in Harare. The rapid decline of commercial agriculture in Zimbabwe has made it increasingly difficult for Cairns Foods to source commercial crops. The company has had to look for alternative commodities and suppliers to remain in business. Sourcing indigenous crops from the Chinyika communities provided a real market opportunity for Cairns Foods.

Cairns Foods contributed vital technical support to the CCDP. A group of seven agronomists from Cairns Foods attended field days where they taught rural families modern farming techniques to improve crop yields. Families were taught how to prepare their land, improve planting techniques and maximise the benefits of cattle manure.

The assistance from Cairns Foods is limited to technical expertise. They have not provided financial help or physical inputs, such as chemical fertilisers or farming equipment. It was important for the relationship between Cairns Foods and the Chinyika communities to be based on local needs. I wanted to ensure that the Chinyika communities become self-reliant, and that no one is in a position to control the terms of trade.

Cairns Foods created a cash market for our crops, by purchasing unprocessed grains directly from village associations. They have developed a marketing strategy and packaging for finger millet, which can now be bought at supermarkets in Harare. Demand for finger millet among urban consumers in Harare is high, and families currently receive five times the income that the government would pay them for maize.

Today, more than 5,000 people in seven villages have benefited from the Chinyika Communities Development Project. For the past two seasons, about 1,000 families have been growing indigenous crops, namely finger millet, pearl millet and sorghum. The quantity of food produced differs from family to family, but each household now has a surplus available to sell, with some earning up to US$5 a day per person. At least 60% of families have built up food reserves sufficient for the next three years.

Each household is operating as a business unit. Families have developed an annual work plan, with annual income targets and a strict budget. The Chinyika communities have established a village association which runs the village learning centre. It also works to develop marketing ideas and to negotiate good prices for families. Each village association administers a village trust, with a joint bank account for community development purposes.

10. Recommendations

Indigenous crops should play an important role in African agriculture. For too long, policy makers have neglected the production of indigenous crops in Africa.

The CCDP has shown that indigenous crops grow better than maize in regions of Zimbabwe with low rainfall.

They are highly nutritious and can be stored for long periods. CCDP has reduced the dependence of rural families on maize, by encouraging rural populations to grow sorghum, finger millet and pearl millet. Over-reliance on a single crop has been the root cause of food shortages in Gutu.

Rural communities should be encouraged to diversify their harvests by growing a variety of crops. Diversification can enable greater security in the case of crop failures. Farmers with diversified crops are better able to respond quickly to external shocks or changes in demand.

The success of the CCDP argues for African governments, donors and research organisations to promote indigenous crops. Priorities include:

- Emphasis on modern farming techniques to improve productivity
- Understanding the potential of indigenous crops to reduce food shortages in arid and semi-arid regions
- Increased funding to develop productive seed varieties

In Chinyika, indigenous crops have assisted families in addressing the problem of persistent food shortages. The Chinyika communities have become net producers of food, with sufficient food reserves in a period of scarcity and famine. They are no longer reliant on buying food from towns and urban areas.

In Zimbabwe, an estimated five million people will need food aid in 2008-9. Further afield, imports of staple food crops are increasing in Africa. Indigenous crops can assist these countries to reduce their dependence on imports, which often absorb valuable foreign exchange.

Demand for indigenous crops far exceeds supply. Policy makers have ignored the marketability of indigenous crops. By encouraging traditional crops, innovative small farmers have been able to capitalise on a ready market for their produce. Priorities to develop the commercial market include:

- Dialogue between retailers and small farmers to develop new markets
- Direct sourcing by agro-processors and retailers to maximise returns for small farmers
- Cooperation between small farmers and agro-processors to ensure stability of supply

The CCDP has successfully fostered changes in the established habits of people in the Chinyika communities. Farmers have grown maize in Gutu for several generations; they enjoy eating maize, which has, in the past, been a profitable crop. The behavioural change in favour of cultivating indigenous crops was not imposed from outside.

Chinyika communities have been actively involved in the design and implementation of the project. They saw the benefits of both adopting traditional crops and applying modern farming techniques. Rural development agencies should always involve locals in designing agricultural projects and policies.

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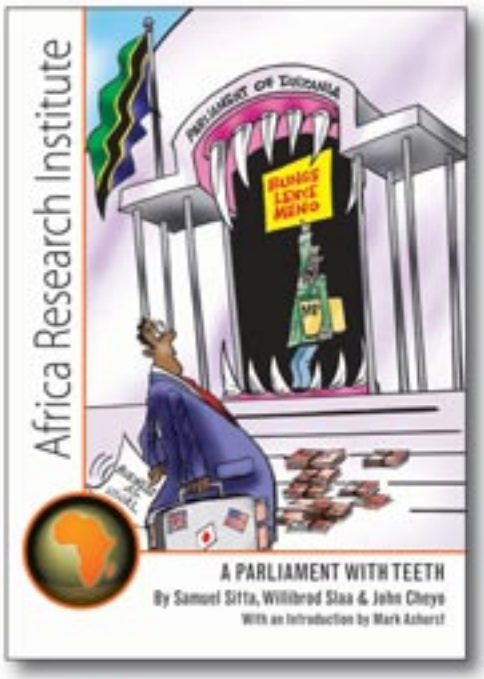

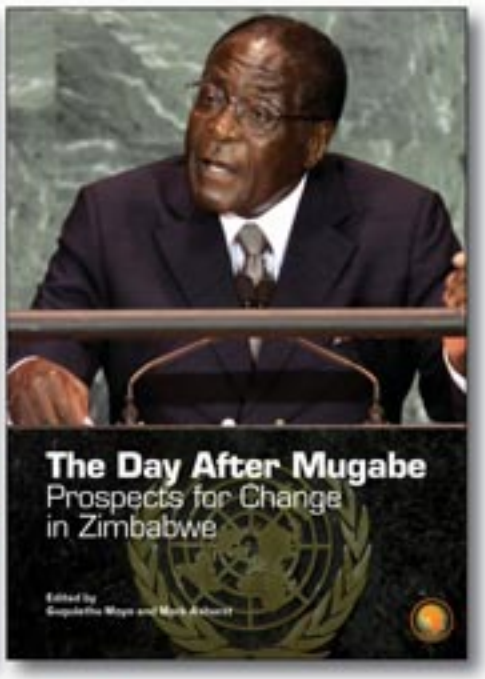

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