



**Climate disruption, food crises and biodiversity collapse:
Time to take Zambian Farmers' Rights seriously**



ZAAB
Zambia Alliance For Agroecology & Biodiversity

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ABOUT THIS REPORT

This report was commissioned as part of the Oxfam Sowing Diversity=Harvesting Security (SD=HS) project in Zambia. The research aims to provide a comprehensive review of Zambia's seed sector to enable a deeper understanding of the key legal frameworks, and current and planned revisions to them, identify key stakeholders and current initiatives in the sector, as well as challenges to the sustainability of seed systems in the country.

The report will act as a reference for the Zambian SD=HS project work focused on promoting the adoption of policies and institutional structures supportive of farmer-managed seed systems (FMSS) and Farmers' Rights. The global SD=HS programme through Oxfam Novib, supports work in eight countries (Zimbabwe, Zambia, Uganda, Guatemala, Peru, Lao PDR, Nepal and China) targeting 200 000 households of indigenous peoples and smallholder farmers, of whom at least 50% percent are women. Indigenous people and smallholder farmers' needs form the basis for its policy work on national, regional and global levels. See more about their work at www.sdhsp.org.

The Zambia Alliance for Agroecology and Biodiversity (ZAAB) is one of three primary implementing partners in the SD=HS project in Zambia, together with Oxfam in Zambia and the Community Technology Development Trust. ZAAB is an advocacy network of faith, farmer and civil society organisations committed to a common cause of realising a just and sustainable food and agroecological system in Zambia. It focuses on seed governance issues ensuring that critical elements related to plant genetic resources and equitable seed systems are considered and supported through policy and legislative mechanisms. See more about ZAAB's work at www.zambianagroecology.org. This report forms part ZAAB's ongoing work and contributes to its partnership within the Oxfam Novib SD=HS global programme.

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EXECUTIVE SUMMARY

Zambia has a wealth of natural resources,^{1/2/3} is politically stable and has enjoyed moderate but sustained economic growth in recent years.⁴ Despite these advantages, the country faces significant developmental and environmental challenges. Its people are hungry^{5/6} and poor,⁷ its forests and biodiversity are fast dwindling,⁸ its debt-to-gross domestic product (GDP) is quickly escalating,⁹ and its government continues to look to the industrialised agricultural models of the Global North for misaligned solutions to Zambian challenges. These models, created by and for large-scale commercial interests, are not suitable for the Zambian context. Their application has contributed to and exacerbates problems of soil erosion and degradation, biodiversity loss and malnutrition in the country.

This report focuses on Zambia's seed system as a critical enabler of agricultural productivity and basis of agrobiodiversity and nutrition and food security. Zambia effectively stands at a crossroads; the decisions it now makes regarding seed-related legislation and regulation could determine to a large extent the country's ability to respond effectively to its socio-ecological challenges, and to climate change.¹⁰

Zambia is revising its seed framework – policies and regulations – to align with regional harmonisation efforts and with the certification and registration standards set by the intergovernmental organisation – the International Union for the Protection of New Varieties of Plants (UPOV) 1991. This will disempower and, in some cases, criminalise farmers' traditional practices of selecting, saving, exchanging, marking and selling their seeds.

Zambia is under no obligation to choose this restrictive route. The current Plant Breeders' Act, for example, is already compliant with requirements mandated by the World Trade Organization's Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS). It is also making these decisions in the absence of a robust national seed policy.

It does, however, have obligations that it is not meeting. Zambia ratified the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) in 2004. The Treaty mandates that countries must take measures to enable the "conservation and sustainable use of all plant genetic resources for food and agriculture and the fair and equitable sharing of the benefits arising out of their use." Zambia has undertaken some administrative measures but has not implemented the Treaty in legislation or acknowledged and realised Farmers' Rights in the country.

Farmers' Rights to save, share and replant seed without restrictions and to breed new varieties adapted to localised microclimates,¹¹ among other rights, are core traditional and collective governing principles of FMSS.

FMSS are institutional (albeit informal, dispersed and under collective governance) levers to protect and enhance agrobiodiversity as well as landscape-level biodiversity. FMSS are cultural storehouses of genetic material used to produce appropriate and nutritious food, feed and medicines, and enable adaption to climate change. As proxies of landscape-level genetic material they will play a critical role in building the adaptive capacity of rural communities as a whole. FMSS will therefore need a legislative and regulatory framework that caters for the dynamic nature of farmer seed and how it is used as a physical, social, cultural and economic unit of exchange. This is not a call for narrow inclusion into existing formal seed frameworks. There is need for a deliberately crafted, inclusive and farmer-led framework that can help FMSS deliver multiple benefits at the community level. The establishment of a national working group focused on implementation of the ITPGFRA, associated Farmers' Rights and the cross cutting obligations to protect biodiversity under the National Biodiversity Strategy and Action Plan (NBSAP) would be a good first step.

There is significant potential to link FMSS and climate change adaptation efforts in Zambia. Zambia is obligated and committed to act on climate change under its Nationally Determined Contribution aligned to the 2016 Paris Agreement and to implement adaptation initiatives. FMSS are integral to diversified agroecological farming systems which offer multiple strategies for adaption and mitigation. We will not only need FMSS that are able to deliver a diversity of seed, able to quickly adapt to changing growing conditions, but also the diversity of traditional and indigenous knowledge that will support the breeding of new varieties from wild varieties and farmer varieties. The ITPGRFA and its obligations were developed for this reason and Zambia committed to fulfil these obligations back in 2006.

There is an urgent need for the Zambian government to view its developmental and environmental challenges as closely interlinked. Current fragmented policies and activities related to land, water, rural development, agriculture, biodiversity, health and climate change need to be brought together into a holistic strategy. This must place farmers, their seed and their diversified farming systems, in the forefront to achieve a sustainable food system and a viable future for all.

CONTENTS

ABOUT THIS REPORT	ii
ACKNOWLEDGEMENTS	ii
EXECUTIVE SUMMARY	iii
LIST OF FIGURES	vi
LIST OF ACRONYMS	vii
1. INTRODUCTION	1
1.1 Research approach and methods.....	1
2. COUNTRY OVERVIEW	2
2.1 Economic outlook.....	2
2.2 Social development indicators	2
2.3 State of the environment.....	2
3. AGRICULTURE IN ZAMBIA.....	3
3.1 Historical and current factors shaping agriculture in Zambia	3
3.2 Contribution of the sector.....	5
3.3 Agroecological zones and crop production.....	5
3.4 Government oversight of agriculture.....	6
3.5 Zambia's farmers.....	8
4. ZAMBIA'S SEED SECTOR	8
4.1 FMSS.....	9
4.1.1 Shifting understanding of FMSS.....	10
4.1.2 Seed as a common and cultural good.....	11
4.2 The formal seed sector	12
4.3 Key actors in the formal seed system.....	13
4.3.1 Government and public organisations.....	14
4.3.2 Industry bodies.....	15
4.3.3 Seed breeders in the formal system.....	15
4.3.4 Seed companies and agro-dealers	16
4.3.5 Seed inspectors and extension officers.....	16
4.3.6 Cross-border trade.....	16
4.4 National seed legislative and policy frameworks.....	17
4.5 Alignment with international and regional frameworks	18
5. REVISION OF ZAMBIA'S SEED FRAMEWORK	19
5.1 Harmonised legislation on production, certification and marketing of seed.....	20
5.1.1 Concerns related to harmonised variety testing, registration and release	20
5.1.2 Concerns related to harmonised seed certification.....	20
5.2 Harmonised legislation for plant variety protection and breeders' rights	21
5.2.1 Concerns related to adoption of UPOV 1991 standards.....	22
6. THE ITPGRFA IN ZAMBIA.....	23

6.1	About the ITPGRFA	23
6.2	Farmers' Rights	23
6.2.1	Urgent need to realise Farmers' Rights in Zambia	24
6.2.2	A shifting understanding of Farmers' Rights	25
6.3	Implementation of the ITPGRFA in Zambia.....	25
6.3.1	What are Zambia's obligations under the ITPGRFA?.....	26
6.3.2	Barriers to implementation.....	26
6.4	Conflicts about digital sequence information in the ITPGRFA	28
6.5	Proven approaches to implementation of Farmers' Rights	29
6.6	Power analysis in support of ITPGRFA implementation	31
7.	IMPORTANCE OF A LANDSCAPE APPROACH	31
8.	INITIATIVES WORKING WITH SEED IN ZAMBIA.....	33
9.	CONCLUSION.....	35
10.	RECOMMENDATIONS	36
9.1	Work through ZARI and the SCCI to raise awareness at government and farmer organisation levels about the ITPGRFA	36
9.1.1	Rationale	36
9.2	Position farmer seed, Farmers' Rights and implementation of the ITPGRFA as a determinant of community adaptation and resilience to climate change	37
9.2.1	Rationale	37
10.3	Actively advocate for a certification system for FMSS that responds to its needs and contributions	38
9.3.1	Rationale	38
10.4	Explore the potential of landscape approaches that support attainment of multi-functional agricultural landscapes, with a focus on FMSS as core elements	38
9.4.1	Rationale	38
APPENDIX A:	SCCI ENGAGEMENT WITH UPOV	40
APPENDIX B:	ZAAB NETWORK OF SUPPORT FOR ITPGRFA IMPLEMENTATION	41
REFERENCES	43

LIST OF TABLES

Table 1: Primary distinctions between categories of farmers in Zambia	8
Table 2: Characteristics of the formal and informal seed market	12
Table 3: Key actors in the formal seed system	13
Table 4: Overview of seed legislation in Zambia (2019)	17
Table 5: Stakeholders providing support for ITPGRFA implementation.....	41

LIST OF FIGURES

Figure 1: Stakeholder power analysis	31
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LIST OF ACRONYMS

CBD	Convention on Biological Diversity
CGIAR	Consultative Group on International Agricultural Research
COMESA	Common Market for East and Southern Africa
DSI	Digital sequence information
DUS	Distinctness, uniformity and stability
FAO	Food and Agriculture Organization
FISP	Farm Input Support Programme
FMSS	Farmer-managed seed systems
GDP	Gross domestic product
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
ITPGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture
MLS	Multilateral System
NGO	Non-governmental organisation
PELUM	Participatory Ecological Land Use Management
SADC	Southern African Development Community
SCCI	Seed Certification and Control Institute
SDGs	Sustainable Development Goals
SD=HS	Sowing Diversity=Harvesting Security programme
UN	United Nations
UPOV	International Union for the Protection of New Varieties of Plants
USAID	United States Agency for International Development
TRIPS	Agreement on Trade-Related Aspects of Intellectual Property Rights
ZARI	Zambia Agricultural Research Institute

1. INTRODUCTION

This report aims to support the full implementation of the ITPGRFA in Zambia by identifying a clear rationale for this, highlighting the contribution that farmers make to maintaining agrobiodiversity and thus adaptation to climate change; indicating obstacles to implementation; and proposing recommended interventions in this regard. It outlines Zambia's current economic, social and ecological context, reviews relevant legal frameworks as well as planned revisions, describes the formal seed sector and FMSS in Zambia and identifies key stakeholders and initiatives that either help or hinder a transition towards a sustainable agricultural sector based on principles of equity, inclusiveness, and socio-ecological wellbeing.

Key recommendations are made to correct the misalignment between Zambia's stated commitment to varied international treaties directing support to smallholder farmers and the protection of agrobiodiversity and its national legislative and policy direction that serves to support commercial, private interests.

1.1 Research approach and methods

This study reviewed government policies and regulatory documents, formal academic studies and grey literature sources to understand the context in which Zambia's seed system operates. It used primary data collection to ascertain the levels of awareness among Zambian smallholder farmers about the ITPGRFA and Farmers' Rights. This data was collected through a series of workshops and farmer focus groups held in 2019, including:

- Shibyunji farmers meeting, hosted at Bingo Farmer Field School, Shibyunji, Central province, 27-28 May 2019 – 65 participants.
- Mongu farmers meeting, hosted at Namushekende Farmer meeting, Mongu, Western Province 13-14 August 2019 – 63 participants.
- Chapula farmer meeting, hosted at Zambia Centre for Horticultural Training, Kalulushi, Copperbelt Province 13-14 May 2019 – 57 participants.
- Pemba farmer meeting, hosted at Kanchomba Farm Institute, Pemba, Southern Province, 23-24 July 2019 – 60 participants.
- Lead Farmer focus group discussion, 28 November 2019 at Kasisi Retreat Centre, Chongwe – 10 participants.
- Multi-stakeholder discussion meeting on the status and implementation of the ITPGRFA in Zambia, 19 September 2019.

Information was also gathered through discussions with key stakeholders, including with:

- Godfrey Mwila, Focal Point Person ITPGRFA, Director of Zambia Agricultural Research Institute (ZARI), 19 September 2019.
- Graybill Munkombwe, Curator, Zambia National Genebank, ZARI, 16 December 2019.
- Civil society and policymaker discussion meeting: Registration of Farmers' Varieties under the Auspices of the Southern African Development Community (SADC) Plant Genetic Resources Centre, Challenges and Opportunities Dialogue, 3-4 December, Victoria Falls, Zimbabwe.
- ZAAB member discussion meeting, 17 December 2019.

2. COUNTRY OVERVIEW

Zambia is a politically stable, democratic and lower middle-income country that has achieved consistent economic growth over the past few years – 3.5% in 2017, 3.7% in 2018¹² and projected to reach 4.3% in 2020.¹³ The country also has a wealth of natural resources – its lakes and rivers hold about 35% of the region's water,¹⁴ its millions of hectares of forests and grasslands are home to globally significant biodiversity,¹⁵ and 58% of its land is arable¹⁶ with only 14% currently under cultivation.¹⁷ It is also home to 6% of the world's copper reserves and is the fourth largest copper producing nation in the world.¹⁸ Despite these advantages, Zambia faces significant economic, social and environmental challenges.

2.1 Economic outlook

The country has one of the highest levels of inequality in the world.¹⁹ Its 2018 GINI rating for net income was a high 49.5;²⁰ Zimbabwe's was 39.8 despite its economic woes.²¹ The economy is significantly vulnerable to external shocks, such as the 2018/19 drought that led to a 35% contraction in agricultural output²² and fluctuating commodity prices on international exchanges. Zambia is in critical debt – the debt-to-GDP ratio grew from 25% in 2012 to about 39% in 2018²³ – affecting how government budget allocations; for example, the 2020 allocation to agriculture dropped by 25% from 2019 with funds diverted to debt financing.²⁴

2.2 Social development indicators

More than half of the Zambian population of about 18 million²⁵ lives on less than \$1.90 a day.²⁶ Twenty percent of the population enjoy the benefits of more than half the total national income²⁷ – and to those living in urban areas; rural poverty remains entrenched, often along gender lines.²⁸ More than 50% of the population live in the rural areas²⁹ with close to 60% dependent on the agricultural sector.³⁰ Zambia was rated as the third “hungriest country on the planet” in 2016³¹ and 2018 figures indicate that about 45% of children under five years of age are malnourished;³² 40% of children are stunted, 15% are underweight and 53% have anaemia.³³ The 2018/19 drought affected yields significantly leaving 1.7 million people severely food insecure;³⁴ 38 districts were declared emergency food insecurity zones in late 2019.³⁵

2.3 State of the environment

The country is losing its biodiversity and agrobiodiversity at an unprecedented rate, particularly in forestry, fisheries, wildlife and water resources.³⁶ This is primarily due to land-use changes for mining and housing development, bush fires (an increased threat under climate change) and overgrazing.³⁷ The country is losing about 276 hectares of forest each year – the equivalent of 6% of its forest cover³⁸ exacerbating already high levels of soil erosion and degradation.³⁹ Industrial-style, mechanised agriculture using pesticides and herbicides also damages soils and contaminates water sources, which, in turn, drives biodiversity loss.⁴⁰

Women farmers in Zambia

Women make up just more than half of Zambia's population,⁴¹ and 64% of its rural population.⁴² They are often forced or encouraged into early marriage – 41% are married by the time they are 18 years of age – and 1 in 37 die in childbirth.⁴³ Almost 50% have experienced physical violence⁴⁴ and HIV prevalence is higher among women than men (15.1% to 11.3% respectively).⁴⁵ Only 38% are educated beyond primary school and women are poorly represented in positions of authority holding only slightly more than 10% of parliamentary seats and about 85 of more than 1 000 local government positions in 2015.⁴⁶

They comprise 80% of food producers in the country, but are often engaged in lower-paid positions than men or undertake work for no pay.⁴⁷

They are often not allowed to own or inherit property in the rural areas,⁴⁸ tend to produce crops for the nutritional security of the household rather than the market and use labour-intensive means of production such as manual tillage because they do not have access to assets to secure finance for mechanised equipment.⁴⁹ They are and will be significantly affected by environmental degradation and climate change as they are mostly responsible for collecting water and firewood.⁵⁰ Women can spend on average 800 hours a year collecting firewood.⁵¹ And they will need to support household nutritional needs in the face of unpredictable weather patterns and shifting pest and disease vectors.

Women are more likely to be marginalised from government agricultural support as they cannot access the necessary capital for the upfront payment of the subsidised inputs and they are not equitably represented in the cooperatives through which subsidies are organised.⁵² Despite being the primary producers, preparers and processors of food, women are hindered from being the primary decisionmakers in the food supply chain. They have circumscribed power to determine what is planted, where and how; and then who has access to that produce whether food is consumed in the home or sold.⁵³

There is inadequate support for women farmers, who need equitable access to productive resources (including land and secure tenure rights) and markets, as well as support in improving post-harvest storage facilities.⁵⁴ It is also difficult for women to market and sell their maize as this is reliant on them leaving their homes – and their multiplicity of tasks and responsibilities.⁵⁵ Global studies indicate that women could increase yields on their farms by up to 30% if given the same access as men to productive resources.⁵⁶

3. AGRICULTURE IN ZAMBIA

3.1 Historical and current factors shaping agriculture in Zambia

Marginalisation of smallholder farmers started in the colonial era through the imposition of protective tariffs, measures and support structures (such as milling infrastructure suited to

large-scale production) biased towards colonial farmers. Maize came to dominate formal production, and it has since edged out more nutritious crops like millet and sorghum as the staple diet. Following independence, government was soon forced into structural adjustment measures and liberalisation of its economy to access loans from the World Bank and the International Monetary Fund in the 1990s.⁵⁷ State support bodies, such as agricultural marketing boards that supported smallholder farmers, were dismantled and state-owned companies were sold to private interests.⁵⁸

Public research and development was and still is orientated towards maize, in particular hybrid varieties.⁵⁹ As with most African countries, there is an over-reliance on maize as a staple food and as a measure of food security.⁶⁰ Maize is not enough to fulfil energy needs or nutritionally diverse enough to supply adequate protein and micronutrients.⁶¹ In September 2019, Zambia's vice-president called on people to start diversifying their diets away from maize to combat the country's very high levels of malnutrition.⁶²

The Farm Input Support Programme (FISP)

The FISP has been in place since 2009 to promote the uptake of commercial seed (mostly hybrid maize) and synthetic fertiliser among smallholder farmers and boost yields. It was estimated that more than two-thirds of maize planted in 2018 was from certified hybrid seed distributed through the FISP.⁶³ In contrast, less than 40% of small- and medium-scale farmers in the world use hybrid seed.⁶⁴ The FISP, which targets about 1 million beneficiaries,⁶⁵ has been beset with challenges around timely delivery of inputs, corruption, exclusionary criteria,⁶⁶ maladministration and lack of transparency,⁶⁷ late payment to input suppliers⁶⁸ and the cost of implementation. Government spent on average 30% of the agricultural budget on it from 2004 to 2016.⁶⁹ The significant resources put into the FISP over the past decade have not significantly increased crop production, raised rural incomes or boosted nutrition security.⁷⁰ The FISP is a threat to agrobiodiversity as it forces hybrid seed into FMSS leading to a loss of local varieties and plant genetic resources over the long term. It has created a dependency on proprietary seed, unsustainable fertiliser use and a range of agro-chemicals that are unaffordable if not subsidised, and which are potentially highly toxic and undermine resilience to climate change.⁷¹

A participant in a ZAAB focus group notes that efforts to save and use farmer seeds were met initially with some resistance because:

They [other farmers in the district] were relying on FISP and had forgotten about their own seed. But now they have seen the delays they realise it's better to have your own seed, then they started growing their own seed again.

Smallholder farmers face several constraints to success. These include increasing competition for land due to population growth and a focus on industrial development and commercial agriculture. An example is the government allocation of about 1 million hectares of customary land for “block” farming orientated towards export crops and run by one large corporate and involving some smaller commercial enterprises and smallholder farmers that are subject to out grower or contract farming, known to facilitate extractive farming methods.⁷² They also lack access to mechanisation and modern irrigation (due to the costs of purchasing, fuel and maintenance),⁷³ which government has prioritised in its Seventh National Development Plan and the 2020 budget. There are, however, environmental consequences to expanding access to mechanised irrigation and agriculture – there are known negative effects on soil health and would enable the clearing of more land thus driving deforestation.

Zambia’s smallholder farmers also face challenges similar to their counterparts in other African countries – lack of appropriate infrastructure and technologies (roads, irrigation, storage, labour-saving devices), unequal or insecure access to land and lack of access to credit and markets. There is also extensive consolidation in the formal agricultural industry with high levels of concentrated ownership and thus market control in the beef, milling, sugar and retail sectors, as well as seed production and sale.^{74/75/76} Seed Co. has 38% market share for maize, MRI/Syngenta has 27% market share for maize, Pannar holds 15% market share for maize and soybean and Zamseed 9% market share for maize, legumes and vegetables.⁷⁷

3.2 Contribution of the sector

Unlike many other sub-Saharan countries, agriculture has on average contributed less than 10% to Zambia’s gross domestic product (GDP) over the past decade.⁷⁸ Wholesale and retail trade contributed the most (18.4%) followed by mining and quarrying (12.9%), construction (10.9%), agriculture, forestry and fisheries (9.9%) and manufacturing (7%) in 2015.⁷⁹ Most export earnings are generated by copper mining.⁸⁰ Not always recognised by formal GDP accounting systems, and often marginalised, is the smallholder farming sector, underpinned by FMSS, that accounts for the bulk of employment in Zambia. It also provides the bulk of food production and of *in situ* conservation of agrobiodiversity and accompanying knowledge.⁸¹ It is therefore viewed as a critical entry point to combat food insecurity, malnutrition and rural poverty.

3.3 Agroecological zones and crop production

Three of the most commonly grown crops in Zambia are maize, groundnut and beans – grown on about 41% of arable land.⁸² More than 65% of agricultural land is dedicated to growing maize.⁸³ Other important crops for smallholders are sweet potatoes and cassava.⁸⁴ Both hybrid and indigenous vegetables are grown where water is available, and harvesting wild products has been a critical food security strategy.

There are three major agroecological zones. Southern, western and some parts of eastern Zambia are relatively risky for crop production with a short growing season, frequent dry spells, erosion, limited soil depth in hilly areas and a diversity of soil types – not all are conducive to increased agricultural production.⁸⁵ It is mostly smallholder cultivation in this region of sorghum, finger millet and maize along with groundnuts, cowpeas and pumpkins.⁸⁶

Central Zambia (most of Central, Southern, Eastern and Lusaka provinces) is home to most of the commercial farms in the country. It has a long growing season and more predictable rainfall patterns – while this zone has the most fertile soils, they still tend to have low nutrient reserves and retention capacity and are acidic and deficient in nitrogen and phosphorus.⁸⁷ Farming systems are mechanised and crops are maize, soybeans, wheat, cotton, tobacco, coffee, vegetables, flowers and breeding livestock.⁸⁸ Commercial farms produce most of the country's cash crops: sugar cane, tobacco, wheat, potatoes and soybean.⁸⁹ Smallholder and medium-scale farmers predominantly grow maize in this region.⁹⁰

The third region lies across northern Zambia, including the Luapula Copperbelt, North-western provinces and some parts of the Central province. This a high-rainfall area with the longest growing season but soils are extremely acidic and leached with few nutrients for plant growth and are also high in exchangeable aluminium and manganese, which are toxic to crops.⁹¹ Smallholder farmers predominate in this region and use very low-input, shifting and semi-permanent cultivation techniques.⁹² They grow mostly cassava, landrace maize varieties, sweet potato, pumpkin, finger millet, beans and a range of commercial and local vegetable varieties.⁹³

3.4 Government oversight of agriculture

The National Long Term Vision 2030 (Vision 2030) provides the main long-term plan and the aspirations of the Zambian people from 2006 to the year 2030. It is operationalised through 5-year national plans that guide national policy formulation and legislative development. The country's Seventh National Development Plan (2017) notes the importance of the sector in support of its aim of creating a "diversified and resilient economy for sustained growth and socioeconomic transformation".⁹⁴ The Zambia-UN Sustainable Development Partnership Framework notes that agriculture is "considered four times more effective in raising incomes among the very poor than other sectors."⁹⁵

The Ministry of Agriculture is responsible for facilitating and supporting "the development of a sustainable, diversified and competitive agricultural sector that assures food and nutrition security, contributes to job creation and maximises the sector's contribution to GDP."⁹⁶ The Ministry works through the National Agricultural Investment Plan (2014-2018) and the National Agricultural Policy (2016-2020). The Plan focuses, under a supposedly pro-poor framework, on finding and prioritising investment and policy changes that will support the intensification

and diversification of agricultural production in line with the Comprehensive Africa Agriculture Development Programme. Its core foci are to ensure the sustainable use of the natural resource base, to enhance infrastructure and market access, to boost food security and disaster management and to support research and technology to develop knowledge systems, including around seed. The Policy, updated in 2015, reaffirms the focus on commercialising agricultural production. The Ministry of Agriculture is also responsible for regulating seed in Zambia.⁹⁷

It is worth noting that oversight for other key areas that support resilience in the agricultural sector (forestry, water, biodiversity) is fragmented across an array of ministries. It is not clear whether there is sufficient integration in planning across them to adequately support a “sustainable, diversified and competitive agricultural sector” ⁹⁸ as described in the National Development Plan.

- The **Ministry of Lands Natural Resources and Environmental Protection** is responsible for protecting the environment, managing forests and administrating land.⁹⁹ It is also responsible for managing biodiversity and implementing the Second National Biodiversity Strategy and Action Plan (2015). The 1999 Biodiversity Policy is aligned with the Sustainable Development Goals (SDGs), the Aichi Biodiversity Targets (2010) under the Convention on Biological Diversity (CBD) and the Global Strategic Plan on Biodiversity (2011-2020). The 2007 National Policy on the Environment is meant to promote environmentally sound agricultural development by regulating the impact of agriculture on the environment.
- The **Ministry of Water and Energy** is responsible for preserving and protecting ground and surface water resources and regulating their use.¹⁰⁰
- The **Ministry of National Development Planning** hosts the Climate Change Secretariat, which coordinates climate change activities undertaken in the country in support of the National Climate Change Response Strategy.¹⁰¹ Zambia’s Climate Change Policy notes the need to encourage crop diversification, including of indigenous and drought-tolerant crops.¹⁰² But understanding that this rests on having high levels of agrobiodiversity and seed availability is missing and so application is inconsistent.¹⁰³
- The **Ministry of Higher Education** has oversight of matters related to biotechnology and biosafety protocols and legislation. Zambia’s Biotechnology and Biosafety Policy (2003) regulates “research, use and release of modified organisms arising from biotechnology and managing their impact on the environment, biodiversity and risks to human health”. The Biosafety Act (2007) regulates “research, development, application, importation, export, transit, contained use, release or placing on the market of any genetically modified organism.”

- The **Ministry of Commerce** is responsible for implementing the Protection of Traditional Knowledge, Genetic Resources and Expressions of Folklore Act (2016). This Act gives “traditional communities, individuals and groups the right to promote the conservation and sustainable use of the country’s biodiversity resources. It promotes fair and equitable distribution of the benefits derived from the exploitation of traditional knowledge, genetic resources and expressions of folklore.”

It must be noted that there is a lack of reliable data on the agricultural sector, particularly on the informal farming sector. The last agricultural census was completed between 1990 and 1992; government has, however, recently started focusing on improving its statistical data collection and dissemination to better support policy development, including for agriculture.¹⁰⁴

3.5 Zambia’s farmers

As in most African countries, the agricultural system in Zambia has a significant base of smallholder farmers producing for own consumption and/or very local markets; these farmers produce most of the food consumed in the country. Table 1 indicates the primary distinctions between farmer categories in the country.

Table 1: Primary distinctions between categories of farmers in Zambia

	Smallholder farmers	Medium-scale farmers	Commercial farmers
Size of land cultivated¹⁰⁵	Less than 5 hectares	5–20 hectares	More than 20 hectares
Level of mechanisation¹⁰⁶	Hand hoe	Hand hoe, animal draft power and tractors	Animal draft power and tractors
Use of external inputs¹⁰⁷	Minimal use	Improved seeds and synthetic fertiliser	Improved seeds and synthetic fertiliser
Markets¹⁰⁸	Mostly own consumption	Mostly for market	Almost exclusively for market

4. ZAMBIA’S SEED SECTOR

The Integrated Seed Sector Development Africa programme identifies five seed systems in Zambia: FMSS, non-governmental organisation (NGO)-supplied seeds (certified varieties), national seed companies that source germplasm from the CGIAR for breeding and deal with commercial and smallholder farmers, international seed companies that focus almost exclusively on hybrid maize and some cash crops, and an export commodities-driven system based on out grower schemes.¹⁰⁹ There is a broad distinction though between formal systems and FMSS. Although FMSS are more prolific and supply the most seeds to farmers in the country they receive little to no government support. This section provides an overview of the formal and informal systems, relevant legislative and policy frameworks, and outlines areas of concern related particularly to FMSS.

4.1 FMSS

FMSS – in which “farmers produce, obtain, maintain, and distribute seed resources from one growing season to the next” – operate mostly outside of the control of government policies and regulations and are guided by traditional knowledge and social customs.¹¹⁰ FMSS are recognised in international frameworks for their important contribution to food security and global biodiversity conservation and ongoing development. Despite this, there is little accurate national data available on crops grown, yields, changing production habits and level of seed diversity.¹¹¹ Farmers note that it can be difficult to source seed from external sources – of the type they prefer and at the cost they can afford.¹¹² As open-pollinated varieties are not a priority for public or private breeding organisations, there is limited – and decreasing - availability on the market.¹¹³ Even then they can be too expensive. FMSS need significant support.

There is no formal government support for our seed system, they have never talked about our local seed before in Shibujunji. Now that we involve the local government offices in the shows, in the food and seed fairs, they are beginning to talk about it. That MP came to that last event, she even said she was going to take this to parliament, she got some samples and said how we need to go back to our roots.

– Timothy Phiri, Farmer in Shibujunji

In Chongwe, the government do support in a small way. The extension officer will be supportive of whatever we do. But they only started supporting us after we started. They did not start any of the seed work themselves.

– Royd Michelo, Farmer in Chongwe

Farmers practice “conscious selection” of seeds checking for resistance to pests and diseases, yield potential, growing period, and suitability for use (taste, medicine, nutrition), among other criteria.¹¹⁴

The most important characteristics in seed selection for Zambian farmers are yield, drought resistance and resistance to pests.¹¹⁵ Seed is often stored in the home near the fire to protect it from pests and diseases, or, if appropriate, stored on top of the roof or in a container, often mixed with ash for pest control.¹¹⁶ The role of community seed banks (CSBs) is also increasingly being recognised. Projects to support communities’ in (re)establishing seed banks are being increasingly promoted across Zambia and viewed as a way to revive lost or neglected crops, and support seed and food sovereignty at household and community scale.

Farmers outlined the factors that they consider important in FMSS and their CSBs in a focus group discussion held on 28 November 2019 at Kasisi Retreat Centre, Chongwe. These are:

- *Quantity... we need to ensure that the seed bank caters for the whole community.*
- *Safety... we ensure that the seed is kept properly the whole year, so when people come and ask questions you can be well set up to respond and show them how it works.*
- *Quality... the way we do it, after we grow the seed in farmer field schools, we select the seeds that are eligible to be called seed and label them; for maize and sorghum and millet we select them while they are tussling; for groundnuts and cowpea we have specific plots for seed production and we select from the main filed good quality plants for seed.*

4.1.1 Shifting understanding of FMSS

A pivotal African meeting in August 2019 of farmer organisations, NGOs, academia and government institutions from 10 African countries discussed the types of support needed for FMSS and how best to facilitate these. A key outcome of the meeting was confirmation of the need for formal recognition of FMSS in African countries, but within a distinctly different framework to that of the formal system.¹¹⁷

Representatives at the meeting noted that farmer seed encompass “populations” and not only “varieties”.¹¹⁸ The diversity of farmer seed cannot be contained within standard certification criteria – it must be understood as a significantly divergent pool of genetic resources and as a complex system containing an equally diverse set of farmer seed practices and knowledge.¹¹⁹ A narrow conceptualisation and resultant imposition of unsuitable regulations on an inherently complex, rich and diverse set of seed systems across the country will have far-reaching and, as yet, unforeseeable consequences for rural farmers and their communities.

When farmer-bred seed is viewed as narrowly as a singular “product”, recognised only for its individual genetic material or its outcome as food, feed, or cash the inherent value and links to culture, nutrition, traditional knowledge, and the broader environment – wild and domesticated biodiversity – is ignored and undermined.¹²⁰ It is not a matter of simply “relaxing” certification standards to enable farmer varieties to be marketed and sold or lobbying for exemptions for farmers from regulations. Existing laws and regulations are not able to accommodate dynamic and evolving farmer seed populations.¹²¹ Work must be done to ensure that the necessary dynamism of localised seed systems is protected by an official framework that supports FMSS. This does not mean developing such a framework from scratch. Examples can be drawn from numerous other country cases.

In the European Union in 2011, a new seed category was introduced for organic seed production (heterogeneous materials) that provides for identifiable characteristics rather than

distinction as per the distinctness, uniformity and stability (DUS) criteria; material does not need to be registered and no intellectual property rights are allowed on the material.¹²² Brazil's 2003 Seed Law exempts local, traditional and Creole seed from registration requirements and notes that these seed must not be excluded from state procurement processes and government feeding schemes.¹²³ The focus is on description of the material and traceability rather than DUS.¹²⁴ Traceability encompasses a description of the parent plants, the scale of diversity, the breeding methods, the farming system used to adapt the population and how long it took, as well as an easy-to-understand description that is relevant to purchasers of the seed.¹²⁵ These all provide insight into the suitability of the seed for different conditions.

There are methods that have proven successful in supporting thriving FMSS, including community seed banks, fairs and exchanges; participatory plant breeding, variety selection and crop improvement; and farmer field schools.¹²⁶ All of these place farmers at the forefront, in control of their production and with agency to engage in decisions on laws and policies that affect them. This "direct custodianship over seed places power in the hands of agricultural producers rather than external corporate-financial forces".¹²⁷

Seed certification based on DUS criteria effectively excludes farmer varieties, which are inherently diverse and classification criteria of any sort influence general farming practices. We need the inherent diversity within farmer varieties to enable them to adapt to changing climatic conditions.¹²⁸ This implicitly rules out a criterion such as stability, which would only be determined over years.¹²⁹ Policies in support of FMSS need to incentivise local seed companies to breed and multiply traditional and indigenous seed and they need to help establish markets for more diverse and traditional crops, particularly for those "on the brink of extinction".¹³⁰

4.1.2 Seed as a common and cultural good

For farmers, genetic resources, seeds and the varieties they produce cannot be separated - seed is commonly viewed as an economic good and varietals as a cultural and legal good, but they are intrinsically linked.¹³¹ Historically, both were regarded as a "common good" derived from the work put in by farmers over centuries.¹³² Restrictions on the re-use of seed (plant variety protection and patenting) and techniques that limit the ability of the seed to produce consistently over time (hybridisation) have opened the doors for privatisation of these commons enabling a minority to benefit from the work of millions of smallholder farmers, without recompense.

Given that these restrictions are socially constructed, they can also be revised.¹³³

Seed and the varieties they produce must be recognised as the outcomes of a rich cultural interaction with the natural environment over centuries – i.e. they are cultural goods and play

an active role in the social structures of Zambian farming households.¹³⁴ Traditional seed exchange is embedded in socio-cultural practices – seed inheritance, gifts for major occasions, reciprocal and non-reciprocal exchanges, which are all built on trust and relationships.¹³⁵ Changes in how, where and what farmers are allowed to exchange therefore has significant implications for social relationships.¹³⁶ Farmers through their seed exchange networks also play a key role in moving genetic material – and thus diversity – across farming units or even further afield.¹³⁷

4.2 The formal seed sector

The sector comprises government agencies – ZARI, the Seed Certification and Control Institute (SCCI) and extension services – and private sector (local and multinational seed companies and agro-dealers) and development agencies.¹³⁸ Table 2 illustrates the primary differences between the formal sector and FMSS.

Table 2: Characteristics of the formal and informal seed market

FORMAL SEED MARKET		FMSS
Characteristics	<ul style="list-style-type: none"> • Produces large volumes of regulated, certified seed; meets about 30% of seed needs • Regulated staged production of seed 	<ul style="list-style-type: none"> • Produces smaller volumes of more varieties of seed, meets about 70% of seed needs • Self-regulated, cyclical production of seed
Actors	<ul style="list-style-type: none"> • Public research and breeding stations • Private breeding and research programmes 	<ul style="list-style-type: none"> • Smallholder farmers • NGOs and research agencies
Type of seed produced	<ul style="list-style-type: none"> • Public sector: Hybrid maize and open-pollinated varieties of staple food crops • Private sector: Hybrid maize and commercial varieties: tobacco, cotton, horticultural crops 	<ul style="list-style-type: none"> • Traditional plant varieties • Farmer recycled varieties • Improved and new varieties
Advantages	<ul style="list-style-type: none"> • Defined and assured physical and varietal quality attributes • High yielding under prescribed conditions 	<ul style="list-style-type: none"> • Readily accessible (available and affordable) • High levels of genetic diversity • Seed requires low levels of inputs • Multi-use: grain can be used as seed
Disadvantages	<ul style="list-style-type: none"> • Narrow genetic diversity, designed for monocrop production • High seed cost, combined with cost of required fertiliser and agrochemicals • Seed treated so cannot be consumed • Limited distribution networks and access 	<ul style="list-style-type: none"> • Sometimes unknown quality and attributes • Can be low yielding

Source: ZAAB/Seed Knowledge Initiative 2019

There is a degree of interaction between the two systems. Seed produced in the formal sector, including certified seed distributed through the FISP, enters FMSS where it is absorbed into farmer practices of seed saving, re-use and exchange. There is a more significant flow from the FMSS to the formal sector, which draws on the gene pool of farmers' varieties to develop "new" ones.¹³⁹ As Farmers' Rights to share in the benefits of the use of genetic material for food and agriculture are not legally upheld and activity supported in Zambia, the benefits of access have "largely accrued to commercially orientated farmers in favourable production areas; and the system is leading to a dangerous increase in the erosion and vulnerability of crop genetic resources."¹⁴⁰

There is some provision within the SCCI for farmer varieties to register in the formal system, but it is an onerous and expensive process for smallholder farmers.

There is no stand-alone seed policy. It is rather embedded in the agriculture policy. Registration of farmers varieties has thus not been spelt out in policy terms. What is spelt out clearly is providing high quality seed – as defined and considered by the commercial sector and international guidelines. There are laws related to the registration of plant varieties, that define what a variety is, based on DUS and VCU standards. Varieties must have a valid denomination in accordance with the regulations. To register and release on the national catalogue – either from within or outside Zambia requires fee of 750.

SCCI recognises that some varieties coming from the rural areas are very good and therefore devised a mechanism to allow some farmer varieties to be registered in the formal system. Through ZARI, working in collaboration with the farmer communities they have collected some varieties, cleaned them and applied for release through SCCI. The responsibility lies with ZARI to ensure purity is maintained and to develop foundation seed for farmers. [Farmers must buy the seed]... then require training from SCCI and inspections to ensure quality and certification processes are followed correctly. – Bruce Chulu, SCCI, 3 December 2019, Victoria Falls, Zimbabwe

4.3 Key actors in the formal seed system

Table 3 indicates key actors in the formal seed system that have responsibility for different stages of production from breeding to sales.¹⁴¹

Table 3: Key actors in the formal seed system

Activity	Responsible organisation/s
Research and breeding	ZARI, the International Maize and Wheat Improvement Center, the International Center for Tropical Agriculture and private seed companies

Variety release and regulation	SCCI and its National Variety Release Committee
Seed production and processing	Local and multinational seed companies
Education, training and extension	The Zambia Seed Trade Association, seed companies and agro-dealers
Distribution and sales	Seed companies and agro-dealers.

The National Plant Genetic Resources Centre also plays a key role in accessing and distributing germplasm in the region and internationally.

4.3.1 Government and public organisations

The SCCI is the mandated agency governing all aspects related to seed laws and policies in Zambia, under the Ministry of Agriculture. It oversees the national variety register, seed production, certification and marketing; as well as plant variety protection mechanisms, the registration of Plant Breeders' Rights, and the collection of royalties for breeders.¹⁴² See 4.4 below for details of relevant legal frameworks.

ZARI is Zambia's largest agricultural research organisation with 10 research stations across all three agroecological zones.¹⁴³ Its mission is to "contribute to the welfare of the Zambian people through the provision of technologies and knowledge that enhance household food security and equitable income-generating opportunities for the farming community and agricultural enterprises while ensuring the maintenance of the natural resource base."¹⁴⁴ It does this through breeding and adapting crop varieties and developing soil technologies to grow agricultural productivity and diversify production.¹⁴⁵ ZARI is increasingly focused on research on climate-smart crops – particularly for drought tolerance – and those with high nutritional levels.¹⁴⁶ The Institute does note the challenges in providing open-pollinated varieties for smallholder farmers as the limited number of off-takers to produce the seed and limited markets (outside of the community) for indigenous crops.¹⁴⁷

The National Plant Genetic Resources Centre currently holds more than 7 000 accessions of crop species and is responsible for *ex situ* conservation of them.¹⁴⁸ The Ministry of Agriculture coordinates the Centre through ZARI. It hosts the national gene bank and works to mobilise and conserve the genetic variability of indigenous and locally adapted crops, as well as their wild relatives.¹⁴⁹ To date, the Centre has distributed almost 2 000 samples, including maize, cowpea, sorghum, pearl and finger millet, sweet potato and indigenous leafy vegetables, to research and learning institutions, NGOs and farmers and individuals on request.¹⁵⁰ The Centre uses the Standard Material Transfer Agreement for genetic material listed in the ITPGRFA and has developed a separate one for those that are not and for Zambian beneficiaries.¹⁵¹ There is a lack of follow up from the Centre on what the germplasm is used for or further developed, which hinders any ability to ensure benefit sharing.¹⁵² Zambia has also contributed to the SADC/International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) Sorghum and Millet Improvement Program, which is housed in Zimbabwe and holds

about 13 500 accessions indigenous to southern Africa and about 75 000 breeding lines developed by the National Agricultural Research System and ICRISAT in the region.¹⁵³ The Program has distributed more than 130 000 sorghum and pearl millet genotypes to SADC national programmes resulting in the development of 46 improved varieties that have been released in SADC countries, including Zambia.¹⁵⁴ These varieties are grown on 38% of sorghum planting area.¹⁵⁵ Zambia also accesses germplasm from CGIAR centres – since 2010 the country has received more than 11 000 accessions of crops held in international gene banks – most for wheat (7 330) and maize (3 295).¹⁵⁶

Biodiversity International hosted a Genetic Resources Policy Initiative to develop capacity in designing policy frameworks for genetic resources in which Zambia participated. The exercise highlighted that there was “inadequate appreciation of the value of genetic resources; limited knowledge on what genetic resources are available, their conservation and use; and low level of awareness on issues related to ownership rights, access to genetic resources and benefit sharing at all levels” in Zambia.¹⁵⁷

It is difficult for smallholder farmers to access germplasm from the public sector, which is underfunded – in 2015, government allocated only \$200 000 to breeding of all crops from a total agricultural budget of about \$300 million.¹⁵⁸ An Integrated Seed Sector Development (ISSD) study indicates that formal breeding focused on yield does not meet the diverse needs of farmers in their diverse agroecological settings. When varieties are developed without farmer input there is often a lack of interest in trying them.¹⁵⁹ Farmers also often don’t hear about new releases because the agricultural extension service is under-capacitated and unless varieties are taken up by a commercial seed company their distribution is limited.¹⁶⁰ The National Plant Genetic Resources Centre is in Lusaka making it inaccessible to farmers living in more remote rural areas.¹⁶¹

4.3.2 Industry bodies

The Zambia Seed Trade Association represents the interests of 19 seed companies to government and plays an active role in the FISP.¹⁶² Its members include Seed Co., MRI/Syngenta, Zamseed, the SCCI, ZARI, Klein Karoo seeds, Pioneer, Monsanto, Stark Ayres and Buya Bamba Croplife.¹⁶³ It works with the Ministry of Agriculture to combat the sale of uncertified and counterfeit seeds in the country. The Zambia National Farmers Union, a membership-based national organization, represents commercial farming interests, including commodity-based associations such as the Dairy Association and the Timber Association.¹⁶⁴

4.3.3 Seed breeders in the formal system

There are about 26 active formal seed breeders in the country – 11 are at ZARI with the balance being private-sector actors.¹⁶⁵ There is a primary focus on breeding maize, rice, groundnut and bean seed.¹⁶⁶ Seventeen of them focus predominantly on maize.¹⁶⁷ Forty-four

varieties have been released for these four crops between 2014 and 2016 – 37 of these were maize.¹⁶⁸ Most companies source their own foundation seed (78% for maize producers) with the balance sourced from ZARI, CIMMYT and CIAT.¹⁶⁹ The average age of maize varieties sold in the formal seed sector is about 10 years with the oldest variety being 24 years.¹⁷⁰ There is an increasing focus on breeding climate-smart varieties, those that are either early maturing or have tolerance to extreme weather conditions (drought, flooding or frost) or both.¹⁷¹ Nineteen of the 37 maize varieties released between 2014 and 2016 were classified as climate-smart for drought-tolerance traits.¹⁷²

4.3.4 Seed companies and agro-dealers

There were 50 registered seed companies in Zambia in 2016 – 17 of these produced and marketed at least one of the three crops.¹⁷³ Only 10 produce certified seed (all produce maize seed) with another seven producing quality-declared seed – the balance of companies are seed traders.¹⁷⁴ The Zambian government is no longer involved in the production or marketing of certified seed following the privatisation of the Zambia Seed Company Ltd. (a government parastatal) in the mid-1990s.¹⁷⁵

There are 450 agro-dealers in the country, equating to one for every 3 276 farmers; this is a much lower ratio than that found in Kenya, Malawi or Zimbabwe meaning that smallholder farmers are more disadvantaged in accessing inputs and in participating in the FISP e-voucher system, which is implemented through agro-dealers.¹⁷⁶ Those that are part of vertically integrated value chains and owned by large multinational and national corporations operate through a range of distribution outlets close to roads and railways across the country. Then there are those owned and operated as small- to medium-scale private enterprises, and often operating in small towns and more inaccessible rural areas. Both, however, focus mostly on hybrid maize and vegetable seed, synthetic fertilizers, and a range of agro-chemicals.¹⁷⁷ There is a significant gap in support for development of farmer seed and holistic soil organic management practices at the local and community scale.

Why can't government multiple these local seeds and supply the agro-dealers and then they give to the farmers rather than buying seed from the seed companies that you must put a lot of chemicals with. – Farmer workshop participant

4.3.5 Seed inspectors and extension officers

There are about 118 licensed seed inspectors in the country – 83 are private and given licences by SCCI.¹⁷⁸ There are about 2 600 agricultural extension officers in Zambia, the equivalent of 1 for every 560 agricultural households.¹⁷⁹

4.3.6 Cross-border trade

Zambia is a net exporter of mostly hybrid maize seed; less than 1% of seed sold in the country is imported, and this is mainly vegetable seed.¹⁸⁰ Maize is the most common seed export and

is exported to Botswana, DRC, Kenya, Malawi, Mozambique, Rwanda, South Africa, Swaziland, Tanzania and Zimbabwe.¹⁸¹ Zambia typically exports more than 60 000 metric tons of seed (mostly maize) each year.¹⁸² Some seed (less than 5 000 tons of mainly vegetable, sweet potato and parental lines of maize) is imported mostly from South Africa, Netherlands, Sweden, Zimbabwe, Malawi and Australia.¹⁸³

4.4 National seed legislative and policy frameworks

Table 4: Overview of seed legislation in Zambia (2019)

	Seed legislation and regulations	Plant Variety Protection laws
Focus area	Production, certification and marketing of seed	Plant breeders' rights
Description	Defines the type of seed covered by the legislation and notes what activities are to be regulated. They also outline how seed will be sampled and tested for quality purposes, mandate labelling requirements and impose import and export conditions. ¹⁸⁴	Provides for intellectual property rights on new varieties developed by plant breeders and grants exclusive use rights for a period of time to enable breeders to make a financial return on their investment in developing a new variety. ¹⁸⁵
Related legislation	Zambia's Plant Variety and Seeds Act (amended 1995).	Plant Breeders' Rights Act (2007)
Related regulations	Plant Variety and Seeds Regulations (1989, revised 2018)	Plant Breeders' Rights (Forms and Fees) Regulations (2011)
Oversight body	Ministry of Agriculture through the SCCI	Ministry of Agriculture through the SCCI
Compliance with international and regional frameworks	<ul style="list-style-type: none"> Common Market for East and Southern Africa (COMESA) Seed Trade Harmonization Regulations (2014) SADC's Regional Harmonised Seed Regulations (2018) 	<ul style="list-style-type: none"> TRIPS UPOV 1978 SADC PVP Protocol (Zambia signed 2018, but has not yet ratified)

The Zambian Plant Variety and Seeds Act (1995) oversees the “regulation and control of the production, sale and import of seed for sowing and of the export of seed, and to provide for the testing and for minimum standards of germination and purity” and to “provide for the certification of seed.” The Plant Variety and Seeds Regulations (1989) provide rules regarding the production, inspection, sampling and testing of seed prior to sale or marketing, as well as prescribing the certification process.

Zambia's Plant Variety and Seeds Act established the SCCI, which also administers the Plant Breeders' Rights Act of 2007. The Plant Breeders' Rights Act provides a form of intellectual property protection for “new” plant varieties. The Plant Breeders' Rights (Forms and Fees) Regulations (2011) operationalises the Act and prescribes the relevant forms and application fees. Zambia's Patent Act was revised in 2016 to ensure compliance with TRIPS. Plants and plant varieties are excluded from patentability.

Levels of understanding about seed laws and regulations are low among Zambian farmers. Farmers note that:

We have never heard government say anything about seed regulations, but we hear it when we go to the agro-dealers. When I ask them to include indigenous seed, he said no, he would be arrested. The licence that agro-dealers have comes with conditions, the seed must be certified... that certificate you obtain from the counsellor [sic] even states that. – Focus group participant

Agrodealers are found in urban areas mostly. Whereas in the village, people rely on their own seed and we don't need to hear about seed laws. – Focus group participant

4.5 Alignment with international and regional frameworks

Zambia is also party to several international and regional frameworks related to the conservation and use of plant genetic material

- **African Model Law:** A policymaking framework to ensure that biological resources are conserved and sustainably used while recognising, protecting and supporting the inalienable rights of local communities over their biological resources, knowledge and technologies.¹⁸⁶ It does not have the status of a convention or treaty and is reliant on funding from African member states. Its uptake and implementation have been slow. Zambia has not implemented.
- **Cartagena Protocol on Biosafety** that regulates the transboundary movement of living modified organisms.
- **CBD.** Zambia signed this in 1993. The CBD aims to conserve biodiversity, promote its sustainable use and ensure that benefits derived from its use are shared fairly and equitably. It brought genetic resources under the jurisdiction of national governments. The CBD, through the Nagoya Protocol (2014), offers a bilateral access and benefit sharing mechanism.¹⁸⁷ Zambia ratified the Nagoya Protocol in 2015. It has also adopted the CBD's Aichi Biodiversity Targets (2011-2020). Zambia's Second National Biodiversity Strategy and Action Plan (2015) sets ambitious goals against these targets, including that government would:¹⁸⁸
 - Define and enforce a national benefit sharing mechanism for genetic resources.
 - Integrate traditional knowledge and practices of local communities by 2020.
 - Maintain the genetic diversity of cultivated plants and their wild relatives by 2025.
- **The United Nations (UN) Food and Agriculture Organization's (FAO) Commission on Genetic Resources for Food and Agriculture** that governs agricultural biodiversity.
- **International Covenant on Economic, Social and Cultural Rights** – including the Right to Food. This is a human right that protects the right of all people to be free from hunger

and malnutrition. Zambia is a party to the International Covenant by way of accession since 1984, which means that the country has an obligation to support the “progressive realization of the right to adequate food”.¹⁸⁹ This means Zambia must establish laws and policies that ensure that people can produce or purchase food and it must “refrain from actions that impeded people’s access to food” and “prevent actions by non-state actors, such as corporations, that undermine access to food”.¹⁹⁰

- **International Plant Protection Convention** to protect cultivated and wild plants by stopping the spread of pests and diseases.
- **ITPGRFA:** The treaty evolved from a voluntary agreement – the International Undertaking on Plant Genetic Resources for Food and Agriculture, which recognised that genetic resources are the “common heritage of humanity”. (See section 6 on the ITPGRFA)
- **UN Declaration on the Rights of Peasants and Other People Living in Rural Areas:** Aims to help improve the living conditions and strengthen food sovereignty in rural areas by better protecting the rights of rural populations.¹⁹¹ It also aims to aid in the fight against climate change and in conserving biodiversity.¹⁹² Zambia voted to approve this declaration in November 2018.¹⁹³

Zambia has also signed an agreement with the UN to drive efforts to realise the SDGs in the country. One of the associated actions is to diversify agriculture and make the necessary investments to build adaptive capacity to climate change and resilience in the system.¹⁹⁴ In 2016, Zambia signed the Paris Agreement committing to implement various mitigation and adaptation programmes through its National Policy on Climate Change.¹⁹⁵

5. REVISION OF ZAMBIA’S SEED FRAMEWORK

Zambia has revised its seed legislative frameworks and policies to align with regional frameworks. It is a member of SADC and COMESA and its seed regulations have been amended to conform to COMESA’s harmonized seed regulations to facilitate movement of certified seed in the region.¹⁹⁶ It is a member of the Organisation for Economic Co-operation and Development Seed Schemes for maize and sorghum.¹⁹⁷ These schemes aim to facilitate international trade in certified seed evaluated against DUS criteria.¹⁹⁸ The legal revisions have made provision to strengthen the formal seed sector (as described above), while frameworks to support FMSS and the important role they play are missing, and the objectives of a number of international commitments related to them have not been legally fulfilled. This particularly relates to the ITPGRFA.

The development of regulations and amendment of seed laws has and continues to be undertaken in the absence of a robust inclusive seed policy. A draft seed policy from 1999 was developed but never formalised. Limited guidance is now captured in the National

Agriculture Policy that provides a general vision for the seed sector and recognition of its importance – largely focused on economic factors though. There are significant concerns about government's alignment of its seed laws related to the production, certification and marketing of seed and its plant variety protection law to regional frameworks. These concerns are detailed below.

5.1 Harmonised legislation on production, certification and marketing of seed

The Plant Variety and Seeds Regulations focus on the application, monitoring and certification of seed in the country, including safety and phytosanitary measures. They were amended in 2018 to align with the 2014 COMESA Seed Trade Harmonization Regulations. Zambia also supports SADC's Regional Harmonised Seed Regulations, but these are not legally binding. Zambia's current system only allows the sale of 788 registered varieties in the country.¹⁹⁹

5.1.1 Concerns related to harmonised variety testing, registration and release

The COMESA regulations aim to facilitate trade in certified seed across COMESA member states. These regulations govern variety release, certification, registration and phytosanitary standards for all member countries. If a seed variety is approved for release within two member states it may be released for sale in all others with no further oversight. There was inadequate consultation with smallholder farmers about these changes in Zambia, despite the fact that they are the most significantly affected. Specific concerns are that:

- The seed may be inappropriate for some countries given the significant diversity of agroecological conditions and there is no redress mechanism in place if the seed fails to perform because of this.²⁰⁰
- The COMESA regulations make the transfer of non-registered seed across borders illegal.²⁰¹
- The sale of uncertified seed becomes illegal.
- This system encourages the distribution and uptake of uniform, commercial – largely hybrid - seeds throughout the region with known negative effects on agrobiodiversity levels.

These regulations primarily benefit the formal seed sector because they will reduce the time and costs involved with national-level variety testing and release protocols in each country.

5.1.2 Concerns related to harmonised seed certification

Seed certification and registration legislation sets out formal processes for determining and guaranteeing the quality of the seed, its origins and characteristics. The COMESA regulations mandate that varieties must be tested against DUS criteria set out as standards of certification for UPOV 1991 as a means of protecting intellectual property rights. Their use as standards is significantly contested because:

- Farmer varieties are inherently diverse, which makes them highly adaptive to changing conditions. This is an advantage in a changing climate, but it is this characteristic that makes them ineligible for certification and sale. If the COMESA regulations are enforced in Zambia, current practices of farmer seed conservation and marketing will be criminalised as no-one without a seed sellers' licence will be able to sell seed.
- Smaller seed suppliers will be forced out of the market as compliance to these very strict standards is expensive and labour-intensive.²⁰² In effect, the seed market will become smaller and likely monopolised by larger corporate companies.
- UPOV standards are not appropriate for Africa where most food is still produced by smallholder farmers. It is a system created by and for industrialised countries and to benefit large commercial seed companies.²⁰³

About UPOV 1991

UPOV has revised its standards three times since they were originally published in 1961. The intergovernmental organisation aims to “provide and promote an effective system of plant variety protection” to encourage the development of new varieties of plants.²⁰⁴ The system grants breeders of new varieties exclusive rights for a set period of time to enable them to generate a return on their investment. This assumption is that this will encourage innovation in plant breeding. Countries that belong to UPOV must set minimum standards for plant variety protection, including that varieties meet DUS criteria. UPOV’s standards have increasingly become orientated towards serving the interests of breeders and, in turn, significantly limiting the rights of farmers to save, reuse, share and exchange seed.

5.2 Harmonised legislation for plant variety protection and breeders' rights

Zambia’s current Plant Breeders’ Rights Act provides a soft form of intellectual property protection for plant breeders who breed “new” plant varieties. Varieties must comply with the DUS criteria to gain protection and enable breeders to derive benefits. The current Plant Breeders’ Rights Act protects breeders by allowing them exclusive use or the right to give authority to produce, reproduce and condition seed for propagation purposes; to sell, market, import and export; or to stock the protected variety for these purposes. It does also though provide exemptions for acts done for non-commercial purposes – farmers would still be able to save and replant seed; to sell the variety as food or for another use that does not involve growing the plant; and undertake experimental acts – to breed and commercially exploit other varieties as long as they are do not share the same essential characteristics as the original protected variety.²⁰⁵ The exchange and sale of seed from protected varietals is prohibited.²⁰⁶

Zambia's existing Plant Breeders' Rights Act complies with the World Trade Organization's TRIPS and provides adequate protection to plant breeders in efforts to incentivise private-sector participation in plant breeding, research and development.

TRIPS

TRIPS is a comprehensive multilateral agreement regarding intellectual property rights – including the protection of new varieties of plants.²⁰⁷ It sets out minimum standards of protection that countries must offer, mechanisms for the enforcement of intellectual property rights and dispute settlement processes.²⁰⁸ Under TRIPS, member countries are allowed to determine their own frameworks (*sui generis* systems) as long as they incorporate the minimum standards.²⁰⁹ For example, they *may* exclude plants or animals from intellectual property protection, as they are considered the heritage of mankind.²¹⁰ Zambia's 2016 Patent Act has been revised to comply with the requirement of TRIPS. *The Act excludes plants and plant varieties from patentability.* It also provides for the protection of traditional knowledge by excluding inventions that duplicate traditional knowledge.

5.2.1 Concerns related to adoption of UPOV 1991 standards

It is clear, however, that Zambia intends to align its Plant Breeders' Rights Act with UPOV 1991 – it has made a formal request of membership to UPOV and it is pursuing harmonisation with the SADC Plant Variety Protection Protocol (which Zambia signed 2018, but has not yet ratified) and the African Regional Intellectual Property Organization (ARIPO) Plant Variety Protection Protocol (Arusha Protocol) (which Zambia has not yet signed at the time of writing). Both of these regional protocols are aligned with and based on the UPOV 1991 standards for protection. When Zambia's Plant Breeders' Act is aligned to UPOV 1991, the SADC and ARIPO PVP protocols will be considered domesticated. This has negative implications for Zambia's FMSS, agricultural production and agrobiodiversity.

UPOV 1991 prescribes rights for plant breeders that are similar to patent protections on plants.²¹¹ To gain protection plants must comply to DUS criteria; their "creator" effectively holds exclusive rights over their use for a set period of time.²¹² This means that farmers cannot save and replant or exchange seeds protected under this system and that they must purchase the seeds themselves.²¹³ It also means that innovative breeding of the protected variety for use in a localised context is prohibited.²¹⁴ In the 1978 revision of UPOV, farmers were still allowed to save seed for their own use and breeders were allowed to develop new ones from the protected variety.²¹⁵ UPOV 1991 does not allow this and effectively extended breeders' rights much further while eroding farmers' rights significantly.²¹⁶ For example, if a farmer used a protected seed to plant his/her fields, but hadn't paid the royalty on the seed, the breeder effectively owns the harvest and any output from it (wheat and wheat flour, for example).²¹⁷ Those looking to breed further from the protected variety are restricted in that any change has

to be major to classify as a “new” variety.²¹⁸ Farmers are forbidden to save seeds for their own use – UPOV 1991 does not protect Farmers’ Rights to use their harvest as further planting material, unless a country makes a special provision to this end.²¹⁹ It also allows the patenting of varieties giving even more stringent protection than plant variety protection rights.²²⁰

UPOV does not provide for sharing of benefits derived from the use of farmer varieties and knowledge – its adoption is counter to Zambia’s legal commitment to the ITPGRFA and CBD. The most valued characteristic of a variety in a time of climate change is its ability to adapt progressively – the plants are not the same as the parent and they are not the same as each other.²²¹ This enables quick adaptation as farmers can choose from a wide variety of the same crop to save and reuse the seed in the next planting season. This characteristic, however, is what excludes farmer varieties from current certification and protection frameworks. This form of varietal improvement must be recognised and encouraged, not criminalised.²²²

6. THE ITPGRFA IN ZAMBIA

6.1 About the ITPGRFA

The ITPGRFA aims for the “conservation and sustainable use of all plant genetic resources for food and agriculture and the fair and equitable sharing of the benefits arising out of their use.” This recognises that “genetic resources for food and agriculture are a common good, and that socio-ecological systems must be protected from over-exploitation by unregulated private economic interests”.²²³ The ITPGRFA also enables access and benefit sharing through a standard contract that was internationally negotiated as opposed to the CBD’s “bilateral” model, where access and benefits are determined between governments.

The country is legally bound to “protect, conserve and ensure the ongoing development of plant genetic resources”²²⁴ with an emphasis on supporting FMSS and ensuring *in situ* conservation of genetic resources. It is also mandated to protect Farmers’ Rights, which are the customary rights that farmers hold as custodians of plant genetic material for food and agriculture. While there is an increased focus in international circles on Farmers’ Rights, the ITPGRFA leaves the responsibility for realising these rights to national governments.²²⁵ There has been limited effective implementation of these measures in Africa,²²⁶ including in Zambia.

6.2 Farmers’ Rights

Farmers’ Rights were first recognised by the FAO in 1989²²⁷ and are acknowledged in a range of international and regional instruments, including the CBD, the FAO-Global Plan of Action, African Model Law, the Seed Treaty²²⁸ and the UN Declaration on the Rights of Peasants and Other People Working in Rural Areas.

Farmers’ Rights are the rights to:²²⁹

- Protection of traditional knowledge relevant to plant genetic resources for food and agriculture.
- Save and replant seeds, without legal and/or technical restrictions, including patenting or plant breeders' rights.
- Share seeds, without restrictions related to their sale or marketing.
- Use seeds to breed new varieties adapted to localised microclimates and preferences.
- Participate in shaping policies related to agriculture and seed.

Possibly the most important right is the one to participate in decision making regarding the use of plant genetic resources for food and agriculture, given that this would enable farmers to provide their input into seed-related laws and policies, which would then influence implementation of their other rights.

6.2.1 Urgent need to realise Farmers' Rights in Zambia

A 2007 Informal International Consultation on Farmers' Rights, hosted by the Norwegian Ministry of Food and Agriculture in Zambia,²³⁰ noted the urgent need to promote awareness of Farmers' Rights among farmers²³¹ and at the government level encouraging the recognition of the importance of diversity, including cultural knowledge, and ensuring that legal, commercial and technological measures that restrict customary use of genetic resources are dismantled.²³²

There is an urgent need to realise these rights in Zambia because they are key enablers in the fight against poverty, hunger, biodiversity loss and climate change.

Smallholder farmers have historically and continue to maintain and grow plant genetic diversity in their traditional farming systems. They do this by carefully selecting and breeding crops that perform well according to the need identified by the farmer – this can be adaptive capacity to changing climatic conditions, quick growing crops to counter the “hungry season”, nutritional or medicinal content, etc.²³³ Given that commercial seed companies focus on crops that return the highest profit margin, any efforts by national governments to marginalise smallholder farming systems by passing exclusionary laws and policies regarding FMSS, does a disservice to the millions of smallholder farmers that are directly reliant on access to agrobiodiversity for survival. Farmers' Rights are therefore “also central to the fight against poverty”²³⁴ as they are in the fight to adapt to climate change.

We will need the diversity of crops and the associated knowledge to breed and/or adapt crops quickly that can cope with increased temperatures and shifting rainfall patterns. Crop diversity is a critical mitigator because it lowers the risks associated with crop failure due to the emergence of new pests and diseases.²³⁵ The knowledge associated with the selection, production, multiplication and use of landraces is a critical factor for climate change adaptation – when the national system focuses on the formal sector it actively encourages the separation

of these elements, which inevitably leads to a loss of this vital knowledge.²³⁶ The formal system itself contributes to a loss of genetic diversity as it focuses only on a few crops and it is aligned to an industrial-style farming system that damages ecosystems.²³⁷ A local example of on-farm breeding for adaption to climate change is Chikankata in Zambia where farmers are choosing local maize varieties that are faster maturing to cope with higher temperatures and shorter growing seasons.²³⁸ Indigenous knowledge of these varieties, held by mostly old women in Chikankata, is critical for this purpose.

6.2.2 A shifting understanding of Farmers' Rights

It is important to note that Farmers' Rights are generally understood as collective rights – over the seed system and associated knowledge.²³⁹ A 2016 stakeholder consultation on Farmers' Rights in Africa led by the FAO noted that Farmers' Rights should "consist of the customary rights that farmers have had as stewards of agro-biodiversity to save, use, exchange, grow, share and develop and maintain plant varieties".²⁴⁰ The resultant position paper notes the right of farmers to be rewarded for their contribution to the development of commercial varieties of plants and to participate in decision making on issues that affect them.²⁴¹ It was emphasised that these were collective and not individual rights.²⁴² The 2016 Africa Position Paper on Farmers' Rights notes that seed laws on the continent should support and protect farmers' ability to save, reuse and exchange farm-saved seed and policies should "enhance the ability and capacity of farmers to be engaged in participatory plant breeding and participatory varietal selection."²⁴³ Seed laws should also ensure easy access for farmers to breeding materials through the National Agricultural Research Institutes, regional agricultural centres and the CGIAR.²⁴⁴

The seed system needs be authentically democratised to realise Farmers' Rights, this entails the active participation of smallholder farmers in crafting the laws and policies that affect them²⁴⁵ and action must be taken to ensure equitable access and benefit sharing as per the multilateral system (MLS) under the auspices of the ITPGRFA.

6.3 Implementation of the ITPGRFA in Zambia

Zambia ratified the ITPGRFA in 2004. It has taken some of the necessary administrative steps by designating national focus points for the Treaty and materials for national collections into the MLS and is involved in multilateral and bilateral initiatives to implement the Treaty in some crop development and improvement programmes, but mostly as a way of facilitating germplasm exchange, and to fund projects under the benefit-sharing model.²⁴⁶

It has not, however, put specific policy and legal measures in place, or a budget, to effectively implement the Treaty or to realise Farmers' Rights. It is also not making full use of the ITPGRFA's multilateral access and benefit sharing mechanism claiming that the CBD's bilateral system provides better incentives and has a bigger international profile. In addition,

Zambia's planned revisions to its seed legislation and policies in harmonisation efforts with regional seed frameworks run directly counter to the realisation of Farmers' Rights.

6.3.1 What are Zambia's obligations under the ITPGRFA?

Zambia has certain obligations under the ITPGRFA, which are to:²⁴⁷

- Promote an integrated approach to the exploration, conservation and sustainable use of plant genetic resources for food and agriculture.
- Conduct surveys and establish inventories of plant genetic material for food and agriculture.
- Promote collection of these resources along with the accompanying knowledge of them – particularly those at threat or that could be of use.
- Promote or support farmer and community *in situ* management and conservation of these resources, as well as that of wild crop relatives and wild plants, including in protected areas.
- Cooperate with other organisations and countries to develop a sustainable global system of *ex situ* conservation.
- Develop and maintain appropriate policy and legal measures that support the sustainable use of these resources – this includes promoting the development and maintenance of diverse farming systems, deepening research efforts focused on biodiversity conservation, and promoting participatory breeding initiatives.

6.3.2 Barriers to implementation

An international stakeholder survey notes that key barriers to the full implementation of Farmers' Rights in Africa include lack of awareness among farmers and government officials, a lack of capacity to adequately implement and monitor these rights and pressure from external bodies to reform national-level policy and legislation.²⁴⁸ In-country focus groups confirm this finding in that awareness of Farmers' Rights is limited in both policy circles and among farmer groups.

As extension officers, we are not trained on the IT [ITPGRFA] and did not know about it until ZAAB came here. We had not heard of farmer's rights. We only know of the commercial seed sold by the big companies in the agro-dealers and through FISP, and then the farmers own local seed varieties. Most farmers continue to grow their own local seed for consumption. But they do not know their rights. – Theresa Mutaka, extension officer

The first time I got information about the ITPGRFA was from ZAAB, maybe about 3-4 years ago. After that I've read about it in other reports, but in Mumbwa you never hear about it from government. ZARI has done a project concerning small bits of seed

multiplication of local indigenous seeds like finger millet and cow pea, but these are always very small amounts, less than a 1kg, and I've seen they often fail as the seed is so little and there is a lack of training and monitoring. Last year there was a team that came from ZARI to interview farmers on Army worms, and any indigenous knowledge on dealing with Army Worm. But I've never heard them talk about the Treaty here, or farmers' rights or that FMSS are important. – Mary Sakala, Lead Farmer

We don't have any specific projects that focus on implementing the ITPGRFA, but use any opportunity we have with farmers, or working with research students, or engagements to stakeholders, to share information and promote the various aspects of the Treaty. – Ernest Bwalya, ZARI, Mt Mukulu

Zambian stakeholders have a long history of discussions related to the full implementation of Farmers' Rights – most recently are four farmer platform meetings held in Central, Western, Copperbelt and Southern provinces in 2019. Ongoing engagements through the ZAAB civil society network have continued the urgent plea for full implementation of Farmers' Rights, particularly in the light of SCCI considerations to amend the Plant Breeders Rights Act to UPOV standards. SCCI has for many years been in communication with UPOV (as many African countries have). The Act has been submitted to UPOV and comments have been made, indicating the changes required to the Act to facilitate compliance and membership of UPOV. SCCI has presented on the purported benefits of UPOV membership at a number of stakeholder engagements.²⁴⁹ (See Appendix A for an outline of SCCI engagements with UPOV).

ZAAB members, as well as numerous national and international research and farmers' organisations, maintain that there are significant conflicts between the standards required by UPOV, and ITPGRFA objectives. A ZAAB member meeting in 2019 noted that further amendments to the Plant Breeders' Rights Act in Zambia will undermine commitments to the Treaty (ZAAB member meeting, 17 December 2019). Although in principle, the Ministry of Agriculture and related government authorities are committed to supporting both the formal private sector and informal FMSS, over the past years there has been significant development of laws and regulations that have benefitted the private sector, while frameworks that protect and support FMSS are distinctly lacking or underfinanced (ZAAB member meeting, 17 December 2019).

SCCI asserts that it is being lobbied by stakeholders, mostly commercial seed companies, to join UPOV, but that it is willing to hear farmer voices on this matter. It is willing to host a stakeholder meeting to provide both groups the opportunity to present their positions on adoption of UPOV standards. While a welcome offer, it is unrealistic to expect underfunded

and under-capacitated smallholder farmers and farmer organisations to compete against trained and experienced lobbyists in a forum such as this. It would be an unbalanced consultation mechanism on which to base such an important decision and would potentially provide an excuse for government to sidestep its obligation to uphold the interests of the people over the interests of corporate entities. Government has signed and ratified the ITPGRFA and must implement it. This means that it cannot join UPOV. It is not up to farmer and civil society organisations to lobby for the implementation of a treaty that government has already committed to.

A multi-stakeholder meeting in September 2019 agreed that the issue or erosion of Farmers' Rights and thus the ability to adapt to climate change need to be raised with the Permanent Secretariat of Agriculture, and conflicting interests within the sector dealt with in order to assure the interests of smallholder farmers in Zambia and to respond to critical concerns of mono-diets from narrow production systems and increasing erratic rainfall, making monocultures, and maize in particular, even more unfavourable in most parts of the country.

It is clear that there is a lack of communication between and even within sectoral departments in Zambia. The current and planned legislative and regulatory amendments are distinctly at odds with the country's statements in various forums that relate to the ITPGRFA. In a submission to the FAO in 2018 regarding the safeguarding of plant genetic resources for food and agriculture, Zambia recommends that:²⁵⁰

- There should be a “holistic seed policy and legal framework that enables the inclusion of all types of seed, including farmers' varieties that may currently not qualify for inclusion on the official variety list.”
- Benefit sharing needs to be made more relevant at the community and national level through, for example, mandating seed companies to contribute some of their profit into a national fund that could go towards realising the ITPFRA.
- Participatory variety selection and plant breeding should be mandated by policy.
- Countries should explore and/or create policies that implement Farmers' Rights at the national level; it cites its Folklore Act as an example of such a policy.

In the same report, Zambia also notes that it promotes on-farm conservation of plant genetic resources through its use of participatory evaluation of landraces and variety selection and support for seed diversity and field days.²⁵¹

6.4 Conflicts about digital sequence information (DSI) in the ITPGRFA

Some good progress was made as regards discussions on Farmers' Rights and national governments were urged to mainstream the Treaty into strategies, policies and programmes at the Eighth Session of the Governing Body of the ITPGRFA in November 2019.²⁵² An

inventory of best practices around realisation of Farmers' Rights was circulated for comment and many countries from the Global South noted the importance of aligning the ITPGRFA and the UN Declaration on the Rights of Peasants and Other People Working in Rural Areas.²⁵³

The inability to reach consensus, however, on the inclusion of DSI into the MLS, however, puts the usefulness of the Treaty in doubt.²⁵⁴ DSI refers to the extraction of knowledge from biological material resulting in the digitalisation of genetic resources.²⁵⁵ In essence, this knowledge can be used and patented in its own right, distinct from the physical genetic material.²⁵⁶ The primary points of contention are the appropriation of this material under intellectual property rights and the equitable sharing of benefits deriving from commercial use.²⁵⁷

The Treaty needs to acknowledge the reality of a digital world and ensure that its MLS remains relevant and effective.²⁵⁸ It currently excludes DSI and so corporate companies are able to freely access and patent genetic sequences, potentially extending the patent to the entire plant and to genetic sequences already held under the auspices of the CBD and ITPGRFA.²⁵⁹ This effectively enables them to bypass payment for access and sharing the benefits derived from the use of the genetic material with smallholder farmers – the primary developers.²⁶⁰

Countries in the Global South – the prime generators and custodians of valuable genetic material – are asking that DSI be included in the ambit of the MSI. African and Near East countries, the Philippines, Uruguay, India and many other developing countries called for its inclusion at the meeting.²⁶¹ Zambia noted at the meeting the danger of ignoring the impact of exclusion of DSI on the effective functioning of the MLS and Via Campesino warned that exclusion could lead to the “privatisation through patents of farmers’ material in the MLS and subsequent prohibition of use”.²⁶² There has been ongoing resistance to this move by industrialised countries whose companies would best benefit by free access to this material.²⁶³ A proposal was put forward and rejected by countries from the Global South on the basis that it lacked “balance with regard to fair and equitable benefit-sharing and does not adequately address genetic sequence data.”²⁶⁴ Zambia proposed that given the lack of agreement, African countries should explore the possibility of regulating DSI related to genetic resources within the MSL under national access and benefit sharing regimes.²⁶⁵

6.5 Proven approaches to implementation of Farmers' Rights

There are proven approaches and mechanisms to implementing Farmers' Rights. At the government level these include establishing a national committee that is representative of all stakeholders, including farmers, undertaking sectoral research to determine cross-linkages (land access, biodiversity, climate change and nutrition), and drafting a Farmers' Rights policy and legislation.²⁶⁶ Effort should also go to scaling these to the regional level and harmonising approaches.

At the community level, activities such as developing biodiversity registers, seed banks and seed fairs play a critical role in documenting and registering community plant genetic resources and knowledge, exposing farmers to what is available and promoting *in situ* conservation of these resources.²⁶⁷ Community seed banks are viewed as key to providing easily accessible, quality and locally adaptable seeds, preserving local knowledge and the bio-cultural heritage of these seeds, and promoting *in situ* conservation of agrobiodiversity.²⁶⁸ Community seed fairs are also viewed as important to create market linkages that scales up availability of seed for and in FMSS.²⁶⁹

Measures to realise Farmers' Rights

According to a 2018 FAO report on Farmers' Rights, India is prioritising the realisation of these rights through a special Act and providing training, capacity building and support for legal measures.²⁷⁰ The same report notes Niger's recommendations for the realisation of Farmers' Rights as: defining a farmer, creating a national committee representative of farmers, and specifying in the material transfer agreements what percentage of the monetary benefits will accrue to farmers.²⁷¹ In Madagascar, farmers have proposed designing and using their own material transfer agreement developed under the Community Biodiversity Registers and Biocultural Community Protocols of Biodiversity International.²⁷² In 2018, Chile established a public-private roundtable on genetic resources with the objective of reaching a common vision and plan to conserve and sue genetic resources.²⁷³ It has established a technical expert group to focus on traditional crop varieties and another to focus on the conservation, multiplication and dissemination of seed varieties that are of interest to smallholder women farmers.²⁷⁴ Ecuador views the realisation of Farmers' Rights as a priority and has a legal framework to promote this – its National Law on Agrobiodiversity, Seeds and Sustainable Agricultural Development – that includes a section on individual and collective rights that align with Farmers' Rights.²⁷⁵

There is space and a rationale for the development of a new national-level strategy for Zambia's plant genetic resources for food and agriculture that could operationalise the ITPGRA.²⁷⁶ Some relevant national frameworks are already in place, such as the Folklore Act (2016) and the National Strategy on Plant Genetic Resources, along with numerous agriculture and development focused strategies, plans and policies that include a focus on food and nutrition security, climate change, biodiversity conservation and rural poverty. Zambia is also party to international frameworks that provide support in this regard, including the CBD and the Nagoya Protocol.

Case study: Revision of existing policy in Uganda²⁷⁷

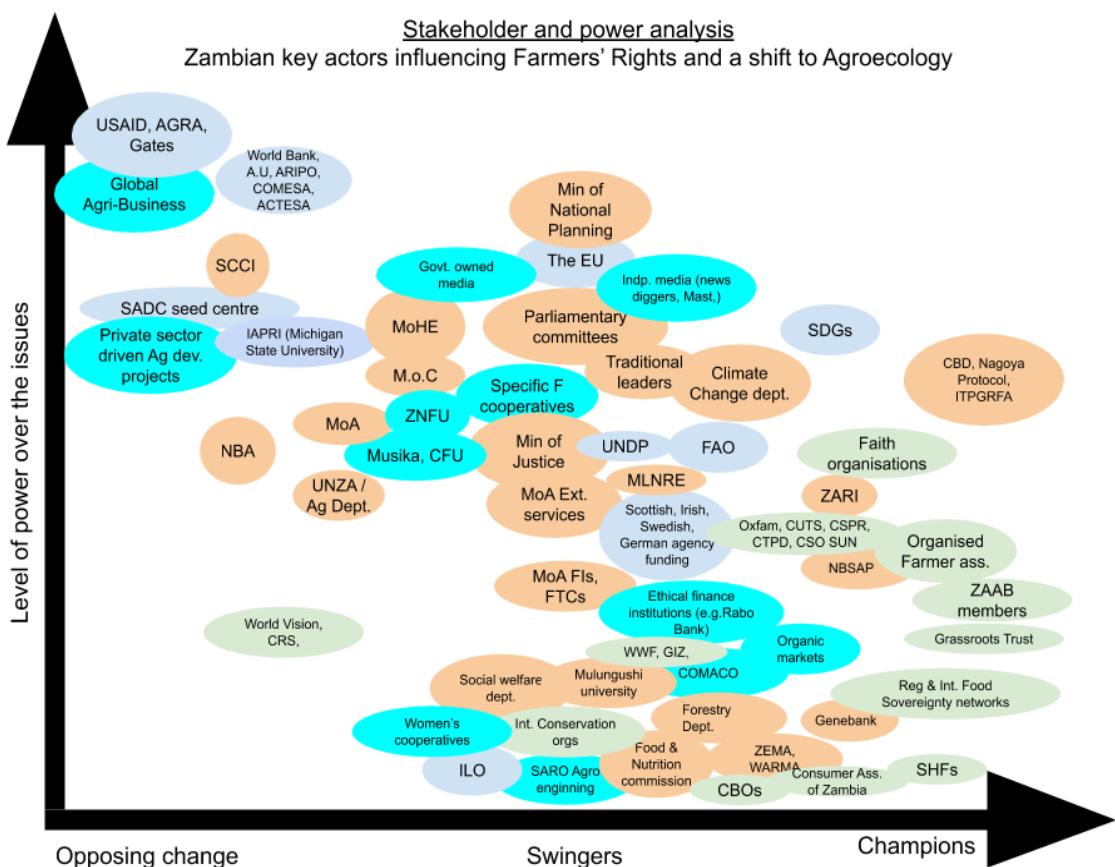
Ugandan government agencies, namely those focused on environment, climate change and plant genetic resources, signed a memorandum of understanding to draft the interim steps

needed to make access to plant genetic resources for food and agriculture more efficient and to implement the MLS of access and benefit sharing. The National Access and Benefit Sharing regulations (2005) were amended to consider these elements and an institutionalised committee was established to bring together representatives of key agencies (with links to the ITPGRFA and the Nagoya Protocol) to build better knowledge sharing relationships. The need to raise awareness among broader stakeholder networks was acknowledged.

6.6 Power analysis in support of ITPGRFA implementation

The figure below indicates the level of influence various seed system stakeholders have and support they could provide regarding the realisation of Farmers' Rights and a shift to agroecology.

Figure 1: Stakeholder power analysis



7. IMPORTANCE OF A LANDSCAPE APPROACH

There is increasing interest in and funding for landscape approaches. These are approaches that holistically consider the scales at which economic, social and environmental functions occur and the interactions between them. They can be broadly defined as "a set of concepts, tools, methods and approaches deployed in landscapes in a bid to achieve multiple economic, environmental objectives (multifunctionality) through processes that recognize, reconcile and synergize interests, attitudes and actions of multiple actors".²⁷⁸

The most prominent approaches include those focused on water retention, agroforestry, agroecology, regenerative agriculture and natural farming at the landscape level, which can be communities, watersheds, territories encompassing multiple communities, and broader regions. Landscape approaches are an acknowledgement that external stakeholders (such as policymakers) can impact local conditions. For example, the FISP has encouraged extensification of agricultural production into marginal lands and the use of synthetic fertilisers and pesticides has contributed to soil degradation and lowered water quality at the local level. At the same time, decisions made around land use at the local level affect the functioning of the broader ecosystem, including services such as pollination, nutrient cycling, hydrological cycle health.

Agroecology, with FMSS at its core, can play a critical role as a landscape approach because it supports local agency and management of resources and aims to bring about transformative change across all three dimensions of sustainability. Agroecology as a practice incorporates a set of practices that rejuvenate soil health, boost agrobiodiversity, support optimal hydrological cycle functioning²⁷⁹ while still incorporating “social, cultural and political principles and goals” as outlined by La Via Campesina.²⁸⁰ At a landscape level, agroecology contributes inherently to both mitigation and adaptation efforts. The Rodale Institute has shown that using composted manure combined with crop rotations can yield a carbon sequestration of up to 2 245 kilograms/hectare/year and reduce the amount of fossil fuels used in production by 33%.²⁸¹ By reducing soil degradation and growing the nutrient content and water-retention capacity of soils, it supports adaptation.

There are 10 core principles within landscape approaches:²⁸²

- Continual learning and adaptation: Landscapes are dynamic and management of them must therefore be based on current information to support adaptive management.
- Common concern entry point: Participatory processes must be undertaken to establish a common vision and plan for a multitude of, sometimes competing, stakeholders.
- Multiple scales: It is critical to understand the extent of social, ecological and economic elements within a landscape, as well as how they interact.
- Multifunctionality: There is a focus on ensuring that interventions support multi-functionality - multiple benefits - and carefully manage the necessary trade-offs.
- Negotiated and transparent change logic: All planning, implementation and monitoring processes must be negotiated by all relevant stakeholders.
- Multiple stakeholders: Extensive engagement with relevant stakeholders is needed on an ongoing basis to ensure equitable and transparent decision making .
- Clarification of rights and responsibilities: It is critical that all stakeholders understand their roles and responsibilities and that there are forums for resolving disputes.

- Participatory and user-friendly monitoring: Monitoring and the dissemination of results is critical to ensure ongoing engagement and transparency.
- Strengthened stakeholder capacity: Efforts and funding must be directed to building the capacity necessary to support management of the landscape.
- Resilience: The overall resilience of the system should not be disturbed if it is functioning well. This rests on a good understanding of the elements at this level.

8. INITIATIVES WORKING WITH SEED IN ZAMBIA

There are a range of international governmental and developmental organisations working on farmer-led seed systems in Zambia, as well as local NGOs. See Appendix B for those with the potential to support the implementation of the ITPGFA in Zambia.

- **Africa Research in Sustainable Intensification for the Next Generation (Africa RISING):**²⁸³ Funded an ICRISAT-led programme in Tanzania, Malawi and Zambia to grow production of basic and certified seed for maize, beans, cowpea, soybean, pigeon pea and groundnut).²⁸⁴ The aim was to accelerate production of breeder and basic seed of improved varieties released by the National Agricultural Research System and build capacity in this regard and build public-private partnerships to support seed systems focused on serving smallholder farmers.²⁸⁵
- **Caritas Zambia.** Caritas Zambia is an institution of the Zambia Conference of Catholic Bishops (ZCCB) dedicated for the promotion of the Social Ministry of the Catholic Church. It's Livelihoods and Climate Change Adaptation strongly supports a food sovereignty agenda; working at national scale to ensure equitable seed and agriculture policies, and through provincial offices and local project levels to promote FMSS and community seed bank initiatives. It is an active member of the ZAAB advocacy network.
- **Catholic Relief Services:**²⁸⁶ Run a Diversity and Nutrition for Enhanced Resilience programme using seed fairs to build linkages between the formal system and the FMSS to promote uptake of certified and quality declared seed. Plans to implement a distribution of small seed packets through SMS platforms. The aim is to grow farmer knowledge about availability of seed and facilitate access.
- **Community Technology Development Trust.** This NGO focuses on agrobiodiversity conservation to facilitate, restore and enhance traditional plant varieties and animal breeds. It promotes the cultivation of diverse crops, including maize, sorghum, millet, cassava, groundnut, cowpea, Bambara nut, beans, pigeon pea and traditional vegetables such as Amaranthus, Hibiscus, Corchorus, and cucumbers, pumpkins and gourds. The Trust works actively to support the objectives of the ITPGRFA, influence seed laws and policies in Zambia to align them to the needs of farmer-led seed systems and is a member of ZAAB.²⁸⁷

- **Drought-tolerant Maize for Africa project:**²⁸⁸ The project developed 22 drought-resistant maize varieties between 2007 and 2014 through ZARI and private seed companies (Zamseed, Capstone, Kamano, Progene and SeedCo.).
- **FAO.** In Zambia, the FAO focuses on growing productivity, enabling policies and investment, improving natural resource management and improving livelihoods.²⁸⁹ Their work with government has helped to harmonise the National Agricultural Policy and the Climate Change Policy and to elevate climate-smart agriculture in policy discourse.²⁹⁰ While it has no specific focus on FMSS, it does on agrobiodiversity.
- **Kasisi Agriculture Training Centre.** This Jesuit organic agriculture training centre is one of the oldest in Zambia and well known for promotion of organic sector in Zambia. It is part of the regional Seed and Knowledge Initiative, and works with smallholder farmers to revive local knowledge and seed systems, and enable long term seed, food and nutritionally security. It actively supports advocacy for agroecology and food sovereignty through its membership in ZAAB.
- **Kamano Seed Company.** A local company that produces seed for smallholder farmers, including for traditional crops like finger millet, sorghum, cowpeas and indigenous vegetables. Zambia typically exports more than 60 000 metric tons of seed (mostly maize) each year.²⁹¹
- **Oxfam.** Oxfam has been working in Zambia for nearly three decades to help improve the wellbeing of rural inhabitants and to facilitate access to services, such as education, health and water. It places an emphasis on promoting the rights of women.²⁹² Oxfam has supported smallholder improved access to quality seed through a soya bean seed enterprises project that helped more than 200 seed growers produce 2.5 metric tons of seed in the 2016/17 farming season.²⁹³ It also supported Kamano Seed Company in increasing its supply of seeds to smallholders in drought-affected areas.²⁹⁴
- **Participatory Ecological Land Use Management (PELUM).** This NGO works with smallholder farmers to eradicate poverty, increase livelihood opportunities and benefits, and build seed and food security. It helps build capacity for resource management, undertakes research and community development, as well as actively lobbying for policy changes.²⁹⁵
- **Programme for Luapula Agricultural and Rural Development:**²⁹⁶ Works with ZARI and farmer groups to increase availability of quality seed and runs a multiplication initiative for beans and groundnut.
- **SCCI and Feed the Future (funded by the United States Agency for International Development (USAID)):**²⁹⁷ Released four drought-tolerant maize varieties in 2014, five groundnut varieties in 2015 and two soybean varieties in 2015 with seed provided and distributed through the Feed the Future; Production, Finance and Improved Technology

Plus +; Commercial Agribusiness for Sustainable Horticulture; Zambia Economic Resilience Program for Improved Food Security; Food Security Research Project III and the Better Life Alliance²⁹⁸

- **Strengthening Agriculture Value Chains through Adoption of Climate-Smart Agriculture project:**²⁹⁹ Focused on promoting climate-smart crop production with 13 000 smallholder rice and soybean farmers. These assumedly feed into the FMSS.
- **We Effect.** The organisation runs multiple programmes in Zambia including Farmers Organizations Fighting Poverty and Injustice that aims to empower farmer organisations to address their needs through successful negotiation with government authorities.³⁰⁰

It must be noted that international organisations tend to focus on promoting the adoption of hybrid seed in line with dominant thinking about the need to intensify production.

The FAO is on the ground [in Zambia], but usually demo plots were of hybrids, talking about food security through maize and cash crops, supporting these big companies.

– Theresa Mutaka, Extension Officer

9. CONCLUSION

This report sought to understand the various internal and external factors that shape Zambia's seed system and to determine where best to intervene to support the emergence of a thriving FMSS, based on the principles of Farmers' Rights. There is growing international acknowledgement of the need to preserve farm-level agrobiodiversity and related knowledge as well as of the importance of FMSS. Zambia has committed to implement the ITPGRFA and has several obligations under this and its commitment to the CBD regarding biodiversity conservation and equitable benefit sharing. The country has not, however, implemented the Treaty in any meaningful way and continues to pursue the path of industrial agriculture, with its known negative impacts on social, ecological and economic systems.

Zambia's people are for the most part poor and malnourished. The environment that many of them rely on for survival is increasingly degraded and polluted. The impacts of climate change are already being felt - and exacerbated by the lack of landscape-scale environmental management. The frequency and intensity of floods and droughts in Zambia is growing, rainy seasons are shorter and average rainfall has decreased while average temperatures are rising at 0.6°Celcius a decade.³⁰¹ Combined with rapid deforestation, land degradation and poor soil conservation practices, evaporation rates increase and infiltration decreases reducing effective rainfall even further. These factors all significantly impact farmers' ability to grow crops – some areas become unsuitable for cultivation, crop flowering times shift, as do pest and disease vectors, and unpredictable rainfall or extreme events result in crop failure.³⁰² As an example, the recent drought caused maize yields to drop dramatically to 50% of the country's average.³⁰³

Farmer-bred seed and FMSS are intrinsically linked to social systems and relationships, nutrition, traditional knowledge and the movement of genetic material across the landscape. Despite their clear significance and national commitments to decentralisation and diversification, the proposed shifts towards even more exclusionary legislation – alignment with UPOV standards and changes to the Plant Breeders' Rights Act – will only further marginalise FMSS and reduce agrobiodiversity. Farmers' work over centuries to safeguard agrobiodiversity has been diminished and pirated as the benefits of genetic material and access to it have accrued to commercial farmers and private companies.

There is a clear lack of understanding of the link between the flourishing diversity of genetic resources and their ongoing evolution. Evolutionary capacity is a critical trait in a changing climate where we will need plant genetic resources able to adapt reasonably quickly to different growing conditions.

It is imperative that smallholder farmers are given not only a voice in how their agricultural systems will be governed, but also that the policies, regulations and agreements that are stifling and will eventually throttle any hope of adapting to climate change in Zambia are dismantled.

The Zambian government, as a signatory to the ITPGRFA, is obliged to promote farmer and community *in situ* management and conservation of plant genetic material resources; to promote an integrated approach to the exploration, conservation and sustainable use of these resources; and to develop appropriate policy and legal measures to this end. It cannot accede to UPOV 1991 standards as this contravenes prior commitments, as well as its own stated commitments to smallholder farmers in the country, and it must adapt its policy framework to fully realise Farmers' Rights in Zambia.

The following key recommendations aim to provide intervention points in the Zambian seed policy framework space to liberate FMSS and their potential to contribute to food and nutrition security, to build resilience to climate change at the community level, and to (re)establish sovereignty over agricultural production, livelihoods and social relations.

10. RECOMMENDATIONS

9.1 Work through ZARI and the SCCI to raise awareness at government and farmer organisation levels about the ITPGRFA

9.1.1 Rationale

ZARI houses the national focal point for the ITPGRFA in Zambia. It also undertakes various initiatives that align with Treaty obligations and makes considerable effort to support its realisation, despite inadequate funding. ZARI offers an entry point into discussions with other government departments and agencies, which will be a necessary endeavour given the current siloed approach to biodiversity conservation, agriculture, nutrition and climate change. The

SCCI has indicated that it is willing to host a multi-stakeholder meeting to discuss the adoption of UPOV, which also provides an entry point into the policy space.

There is a need to:

- Enable a common understanding of the interlinked challenges that Zambia faces – poverty, food insecurity and a degrading environment in the face of climate change – among multiple government departments and related agencies.
- Promote an understanding of the ITPGRFA as a critical international framework for safeguarding agrobiodiversity and the socio-ecological systems within which agrobiodiversity is maintained, including and importantly traditional and indigenous knowledge systems.
- Ensure that the Folklore Act (under the Ministry of Commerce) is implemented through a collaboration of an inter-ministerial agency to actualise streamlined benefit-sharing obligations of the CBD and ITPGRFA, as well as enhance and not exploit plant genetic resources and FMSS.
- Advocate and help facilitate the establishment of a national working group on Farmers Rights' in the Zambian context.
- Motivate for an encompassing policy framework for protecting and regulating plant genetic resources for food and agriculture.

9.2 Position farmer seed, Farmers' Rights and implementation of the ITPGRFA as a determinant of community adaptation and resilience to climate change

9.2.1 Rationale

Zambia is obligated and committed to both mitigation and adaptation actions as regards climate change. It needs to undertake mitigation efforts under its Nationally Determined Contribution aligned to the Paris Agreement and to adaptation efforts, particularly with rural communities. ZARI, for example, is increasingly focused on breeding climate-smart varieties to build resilience to more extreme weather events, such as droughts, and changing rainfall patterns. It is not clear, however, whether there is a clear understanding at the government and/or community and farm level of the links between soil health and mitigation (carbon sequestration) and the need for stable ecosystem functions (water and air availability and quality, pollination, adaptation of existing and wild crops) to support adaptation.

There is a need to:

- Enable a holistic understanding of landscape-scale ecosystem functions and their ability to contribute to or hinder efforts aimed at building resilience to climate change, including the role that FMSS and indigenous and traditional knowledge can play in this regard.
- Link funding for climate change interventions with environmental and social sustainability indicators to maximise impacts and contributions towards the SDGs.

- Integrate biodiversity policies with those of rural development, climate change and agriculture, and importantly including PGR, to slow down the rapid rates of loss experienced in Zambia.
- Ensure that interventions focus on “building resilient and empowered human capital”³⁰⁴ that grows farmers’ agency to actively participate in and contribute to government policy development, particularly on critical issues such as climate change.

10.3 Actively advocate for a certification system for FMSS that responds to its needs and contributions

9.3.1 Rationale

There is a need for formal recognition of FMSS on the African continent, but not as a “step-child” to existing policies. Recent discussions held between farmer organisations, NGOs, academia and government institutions noted that FMSS need distinctly different frameworks that serve their needs and contexts. This requires an understanding of farmer-managed agrobiodiversity and seed systems as a significantly divergent pool of genetic resources that is used and governed by an equally diverse set of practices and knowledge. FMSS need a stand-alone supportive legislative framework and guidelines tailored to their unique attributes.

There is a need to:

- Create a baseline survey of FMSS in Zambia using participatory methodologies to understand how they have evolved, their key determinants of success, their contribution to building farm- and community-level resilience, and what they require. Given that Zambia is embarking on a project to update its capacity to conduct accurate and extensive surveys in the agricultural sector, it could be worth advocating for this type of information to be included in survey designs.
- Understand, document and disseminate farmer innovation because farmer-to-farmer learning is an effective means of transferring knowledge quickly to those who need it the most. This also supports climate resilience.

10.4 Explore the potential of landscape approaches that support attainment of multi-functional agricultural landscapes, with a focus on FMSS as core elements

9.4.1 Rationale

A re-envisioning and new understanding of agricultural genetic material is needed to encompass the broader living ecosystem, which also contains socio-cultural systems. Current policies and interventions look at elements in the system in isolation, which does not allow the complexity and interconnectedness between elements to emerge. There is emerging consensus around the need for landscape approaches for ecosystem restoration with an emphasis on ensuring socioeconomic benefits accrue to those who live in and manage the landscape. Zambia is already experimenting with landscape approaches for reforestation

projects. There is an increasing amount of funding available and demand for these approaches, which are based on principles of inclusivity, participatory methods, and generating social, economic and ecological benefits.

There is a need to:

- Make the links between traditional and indigenous FMSS principles and practices and rural cultures, economies and customs. The FMSS does not sit isolated in the agricultural landscape, but performs a multiplicity of functions, which for the most part are not understood at the government level.
- Explore which government departments are already working within these frameworks and are focused on biodiversity, soil health, climate change and rural development to understand where to position the principles of the ITPGRFA within project design.
- Advocate for Farmers' Rights to form a core principle of landscape approaches.

APPENDIX A: SCCI ENGAGEMENT WITH UPOV

Zambia has been engaging with UPOV since 2009 regarding its membership and the required changes to its Plant Breeders' Act (2007). The timeline below provides an overview of the types of engagement.³⁰⁵

- “March 2009: The Seed Control and Certification Institute informally requested UPOV input on its Plant Breeders Rights Act (2007).
- June 2010: UPOV informed the Institute that several provisions of the Act did not correspond to UPOV 1991 and recommended that these be amended.
- 17-18 June 2010: UPOV participated in a Plant Breeders’ Rights workshop in Lusaka.
- 25-29 July 2011: Zambia’s Chief Seeds Officer consulted UPOV at a meeting in Accra about how best to amend the act to comply with UPOV 1991.
- 15 October 2013: UPOV met with representatives from the Ministry of Agriculture and Livestock in Lusaka to discuss the amendment of the Act.
- 28 September 2017: UPOV received a formal request for assistance in becoming a member of UPOV.
- 2 October 2017: UPOV provided information on the procedure to follow.
- 18-22 June 2018: Zambia attended a UPOV meeting in Geneva: *Forum on the role of UPOV in the development of agriculture*. A meeting was held with UPOV to discuss relevant options to amend the Act.”
- 28-30 January 2019: Zambia attended a UPOV workshop in Geneva on drafting legislation in alignment with the UPOV convention.³⁰⁶
- 14 March 2019: Zambia attended an advanced course on Intellectual Property for Government Officials.³⁰⁷
- 27 March 2019: Zambia attended a workshop in Sweden on Advanced International Training Programme on Intellectual Property and Genetic Resources – in Support of Innovation.³⁰⁸
- 19-21 June 2019: Zambia attended a training session in Japan on Plant Variety Protection and Quality Control System of Seeds to Facilitate Distribution of High Quality Seeds.³⁰⁹

APPENDIX B: ZAAB NETWORK OF SUPPORT FOR ITPGRFA IMPLEMENTATION

ZAAB works collaboratively with an extensive range of stakeholders that provide the network with technical, research, advocacy and implementation support and best practice – see Table 5. Based on the research and power analysis, it seems logical to focus on those falling within the “swinger” category and those able to provide on-the-ground support. The following departments and organisations could potentially provide the SH=HS programme with entry points.

Policy intervention points

- ZARI, as it is the focal point for the ITPGRFA and does work to its principles in some regards.
- Ministry of National Development Planning because it hosts the Climate Change Secretariat.
- Ministry of Lands, Natural Resources and Environment because it is the focal point for the Nagoya Protocol and CBD.
- Media – there is keen media interest in climate change and food security, and media influences government and citizenry.
- The active civil society and farmer alliances working together to ensure pro-poor agriculture and rural development
- Community Technology Development Trust – actively works with farmers to support and develop FMSS and farmer varieties in Zambia.

Table 5: Stakeholders providing support for ITPGRFA implementation

Research and advocacy support	
At the regional level:	At the international level:
<ul style="list-style-type: none"> • African Centre for Biodiversity • Seed and Knowledge Initiative • Alliance for Food Sovereignty in Africa • University of Cape Town • Hivos 	<ul style="list-style-type: none"> • GRAIN • Third World Network • ETC Group
Networking support	
At the national level:	At the regional level:
<ul style="list-style-type: none"> • Civil society organisations: Jesuit Centre for Theological Reflection, Civil Society for Poverty Reduction, ActionAid Zambia, CSO SUN, CUTS, Centre for Environment Justice, Zambian Climate Change Network • Zambian National Farmers Union • FAO Zambia • Churches • Traditional leaders • Christian Council of Zambia 	<ul style="list-style-type: none"> • Seed and Knowledge Initiative • Alliance for Food Sovereignty in Africa • African Biodiversity Network • PELUM Association
Implementation support	
At the national level:	
<ul style="list-style-type: none"> • ActionAid Zambia • Birdlife Zambia • CARITAS Zambia • Community Technology Development Trust • Chongwe Organic Producers Association • Eastern & Southern Africa Farmers' Forum (ESAFF) Zambia • Grassroots Trust • Green Living Movement • Kasisi Agriculture Training Centre (KATC) • Mukupa Dairy Cooperative • Oxfam Zambia • Pelum Zambia • Rural Women's Assembly Zambia • The Schools and Colleges Permaculture (SCOPE) Zambia • Zambia Land Alliance (ZLA) 	

Governance information and support		
At the national level:		
<ul style="list-style-type: none"> • Ministry of Agriculture (MoA), SCCI, ZARI, National Genebank, provincial and district training centres • Ministry of Higher Education, Science, Technology & Innovation and associated National Biosafety Authority • Ministry of Lands, Natural Resources and Environment and Zambia Environmental Management Agency • Ministry of Justice; Ministry of National Planning; National Assembly 		
Technical support		
At the national level:	At the regional level:	At the international level:
<ul style="list-style-type: none"> • National Gene Resource Centre • Zambia Agriculture Research Institute • Nutritional Department and Law Department at University of Zambia • Zambia Law Development Commission • The Indaba Agricultural Policy Research Institute 	<ul style="list-style-type: none"> • SADC Gene Resource Centre • African Centre for Biodiversity • Alliance for Food Sovereignty in Africa • Biowatch South Africa • Legal Resource Centre • EarthLore • Seed and Knowledge Initiative Partners 	<ul style="list-style-type: none"> • Global Network for the Right to Food and Nutrition • GRAIN • Third World Network • GAIA Foundation • Trust Law International • Community Alliance for Global Justice

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