



The Role of Informal and Formal Seed Systems on Seed Security in Malawi

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Abstract

Since the early 1990s, most African countries have implemented seed sector policy reforms aimed at strengthening formal seed systems to enhance agricultural productivity through improved access to high-yielding varieties. However, empirical evidence on the outcomes of these reforms remains mixed. This study examines the policy implications of seed system reforms in Malawi, focusing on the operationalisation of legal and institutional frameworks, seed availability (in terms of quantity and crop diversity), and changes in smallholder farmers' seed-sourcing patterns. The analysis draws on secondary data from grey literature, large-scale Integrated Household Panel Survey (IHPS) datasets, and primary data collected through fieldwork, including focus group discussions (FGDs). Results indicate that the operationalisation of legal and institutional frameworks for the formal seed system has lagged behind private sector growth. Moreover, private sector expansion has not translated into increased seed quantities or greater crop diversity in the market, leading to increased reliance on informal seed systems by smallholders. The FGDs reveal that poverty, limited availability, and poor seed quality are key barriers to the adoption and use of certified seed. These results suggest that current reform approaches inadequately address smallholder seed access constraints. The study highlights the need for more inclusive seed policies that recognise and support the complementarities between formal and informal seed systems in order to improve smallholder access to high-quality seeds and strengthen agricultural resilience.

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Biographical notes

Henry Geoffrey Hunga has a PhD in Development Studies with a research interest in the public policy process in developing countries. His work has mainly been linked to economic reforms and how they have affected the livelihoods of the most vulnerable in society. He is experienced in qualitative and quantitative research using participatory tools.

Introduction

Discussions and efforts to develop and replace the informal seed system with a formal system have been ongoing since the 1960s, aimed at improving agricultural production (Almekinders et al., 2019; Rutsaert et al., 2024). Since then, substantial investments in breeding programmes, seed production, and policy reform have been undertaken based on market-led policies to increase the private sector's role (Hunga et al., 2023a). However, limited adoption of high-yielding varieties has been reported and linked to complex and interrelated factors. These factors range from farmers' risk aversion and affordability issues to a lack of trust in formal seed sources and the failure of reformed institutional and policy environments to mediate quality seed availability, crop diversity, and distribution (McGuire and Sperling, 2016; Tripp, 2000; Westengen et al., 2023). Hence, this paper is driven by discrepancies in formal seed sector performance and examines how policy reforms have supported the development of regulatory institutional infrastructure to improve high-quality certified seed availability and influence farmers' seed-sourcing patterns.

On the policy side, inertia caused by limited funding and contestation between farmers' and breeders' rights has hindered the development of the formal seed system (Hunga et al., 2023a; Kuhlmann and Dey, 2021). This has created a gap between policy intent and practice, reflecting deeper institutional and informational asymmetries, where agricultural innovations have failed to reach or convince farmers due to weak extension systems, mistrust, or inconsistent regulatory enforcement (Kuhlmann and Dey, 2021). Regulatory services have fallen short of expectations because of a lack of financial and human resources, infrastructure, and equipment, resulting from delayed institutional framework development (Hunga et al., 2023b).

In terms of seed availability, the formal seed system has supplied enough certified maize seed for only a third of the maize cropland area in Malawi and other sub-Saharan African (SSA) countries (Langyintuo et al., 2010). Furthermore, the utilisation of certified seeds among smallholders remains at 67% for maize (mainly from government subsidies sufficient for 0.25 ha), an average of 18% for legumes, and below 10% for rice and sorghum in Malawi (Benson et al., 2024; Malawi Government, 2024; Simtowe et al., 2016). In fact, studies have shown that limited availability, access, and utilisation of improved high-quality seeds have been the most important limiting factors to increased agricultural production (Sperling and McGuire, 2012; Tripp and Rohrbach, 2001). This is reflected in the seed-sourcing patterns of smallholder farmers, where reports indicate that the informal seed system and local markets remain the backbone of access to diversified crop seeds (Mastenbroek, 2025; Sperling et al., 2020a; Sperling et al., 2020b). As such, to date, most SSA countries lack an effective formal seed system, which is currently characterised by lengthy development and delivery periods affecting new cultivar release, commercialisation, and certification processes (Auriol and Schilizzi, 2015; Marechera et al., 2016).

Identifying the reasons for the failure to move from policy intent to action through an understanding of the factors and actors shaping innovation development, diffusion, and scaling is critical (Jacobsson and Bergek, 2011). Hence, this paper borrows from studies that have used innovation system analyses to identify systemic challenges and specify areas requiring remedial interventions (Smith, 2010). The challenges with seed sector development and reforms highlight the need to understand seed system reform not merely as a technical or marketing mechanism but as a socio-institutional system shaped by interactions among diverse actors, institutions, and policy environments (Daum et al., 2025). Therefore, this paper employs the agricultural innovation systems framework to examine Malawi's formal seed system institutional and infrastructure development for effective service delivery in terms of quantity and diversity. This is achieved by answering the question: how have farmers' seed-sourcing patterns shifted over time between formal and informal systems? By situating the question within the broader innovation systems debate, the study contributes to understanding policy reforms where actors, through sets of institutions, interact to shape seed system transformation in a developing-country context (Vermunt et al., 2022). The paper fills a knowledge gap regarding the effect of policy reforms on the formal seed system, as current studies have been limited to the impact of disasters,



conflicts, and poverty, or to those examining farm-level sourcing and the role of extension (Nguyen et al., 2025; Remington et al., 2002; Sperling et al., 2008; Sperling and McGuire, 2012; Wambura et al., 2015). This study will inform future formal seed system policy reviews aimed at addressing the challenges facing contemporary seed sector policies (Kuhlmann and Dey, 2021). The paper combines primary data from focus group discussions and secondary information from organisational reports, publications, and nationally representative Integrated Household Panel Surveys (IHPS) 2 to 5 between 2004 and 2020 (NSO, 2020). The results focus on eight crops—maize, groundnuts, rice, sorghum, soybeans, beans, pigeon peas, and cotton—in line with the Malawi government's food security, export, and crop diversification strategies (Malawi Government, 2013; Sperling et al., 2020a). Specific analysis has been conducted on seed availability in the market for selected crops and on how farmers' sourcing patterns have shifted between formal and informal seed systems over time.

Literature Review

A seed system is defined as the network of actors, activities, and institutions involved in the breeding, production, multiplication, storage, distribution, and use of seeds (Munyi and De Jonge, 2015; Westengen et al., 2023). Globally, two seed systems have operated side by side: the formal system, comprising government departments, parastatals, and the private sector, governed by laws; and the informal system, made up of farmers, their associations, and non-governmental organisations (NGOs) supporting them (Cromwell et al., 1992; Louwaars and Manicad, 2022). For Malawi, the informal seed system included smallholder seed multiplication schemes using the less stringent quality-declared seed class for seed production of crops not promoted by the formal seed system (Malawi Government, 1993).

The development of Africa's formal seed system began in the 1960s, driven by a desire to modernise agriculture by replacing the informal seed system with a public formal seed system (Kuhlmann and Dey, 2021; Louwaars and Manicad, 2022). At that time, post-colonial governments, building on inherited research and extension infrastructures, introduced seed certification standards and national breeding programmes modelled on those of industrialised countries (Louwaars and Manicad, 2022; Remington et al., 2002). The initiative aimed to develop a public formal seed system to boost agricultural productivity through the use of improved high-yielding varieties. This shift to the public formal system was based on the characterisation of the informal seed system as small-scale, farmer-managed production and exchange (Deu et al., 2014; Westengen et al., 2023). Further reforms of the public formal seed system were initiated under the market-led policies of the Structural Adjustment Program (SAP) beginning in the 1980s. The reforms were based on market-led policies through regional trade integration frameworks within the Southern African Development Community (SADC) and the Common Market for Eastern and Southern Africa (COMESA) under the harmonised seed regulations (HSR) technical agreements (Hunga et al., 2023a). Hence, since the 1990s, Malawi has pursued economic liberalisation and regional economic integration through SADC and COMESA technical agreements (Hunga et al., 2023a; Westengen et al., 2019). The policy shift led to reforms aimed at improving seed quality, increasing private sector participation, and expanding farmers' access to improved varieties through certification and market-based distribution. At the regional level, to streamline seed trade and movement, member states are expected to domesticate three areas into their national laws: variety release and registration procedures; seed certification and quality assurance; and quarantine and phytosanitary measures (FANRPAN, 2010; Kugbei, 2003).

For Malawi, the reforms meant the development and enactment of the National Seed Policy of 2018, the Plant Breeders Act of 2018, the Plant Protection Act of 2018, and the Seed Act of 2022 (Hunga et al., 2023a; Kuhlmann and Dey, 2021; Westengen et al., 2019). Specifically, the National Seed Policy serves as the operational framework for the formal seed sector in Malawi, while the three pieces of legislation regulate breeding, seed production, movement, and marketing (USAID et al., 2020). Since then, the formal seed system has expanded in scope in Malawi, with over 25 seed companies and 700 agro-dealer outlets (Hoogendoorn et al., 2018; Mgomzulu et al., 2025). An FAO review of 94 countries on emerging seed policies and laws indicates that 29% explicitly ban the sale of non-certified seeds, and 25% have exceptions for specific crops (FAO, 2019).

Furthermore, some countries, including Malawi, have adopted stringent seed policies with no support for the informal seed system (FAO, 2019; Westengen et al., 2019). Hence, this paper tries to fill the gap regarding the implications of seed system policy reform on institutional framework development and performance, where literature is limited (Marechera et al., 2016).

Theoretical Framework

This study draws on the agricultural innovation systems (AIS) framework (Table 1). The framework offers a comprehensive perspective for analysing policies and how their associated institutions, information flows, and actor relationships influence the development and functioning of an innovation system (World Bank, 2006). The AIS framework was developed to support innovations that improve agricultural research, extension, and education by public, private, and third-sector organisations (Daum et al., 2025). AIS consists of four components: institutions, actors, interactions, and infrastructure (Wambura et al., 2015). The absence or misalignment of these components—such as weak institutions, missing actors and skills, distorted interactions between actors, and inadequate funding and infrastructure—may hamper AIS progress (Vermunt et al., 2022). Therefore, this study considers an innovation system, the formal seed system, as an extension beyond simple technology or knowledge transfer to include support systems and related infrastructure (Hekkert et al., 2007). AIS thus includes all institutions, firms, and economic structures that influence both the rate and direction of technological change within a community (Hsu and Chen, 2003). The success or failure of technology, i.e., the formal seed system, may depend not only on competition among available technologies but also on competition with various existing innovation systems (Hekkert et al., 2007). This is especially relevant within the seed sector, where formal and informal systems have operated side by side (Wambura et al., 2015).

Hence, under AIS, actor networks (individuals or organisations) develop, experiment with, and disseminate innovations, guided by institutions such as laws and regulations (Daum et al., 2025). Malawi adopted and developed legislation (institutions) in line with COMESA and SADC's three areas of harmonisation to regulate actors' behaviour and support infrastructure development within the formal seed system. Thus, in this paper, AIS has been used to identify challenges in the formal seed system in Malawi through a combined component-function analysis. This is achieved by employing Kieft et al. (2017) and Bergek et al. (2008) Agriculture Innovation Systems' four-component approach to analyse the systemic problems of the formal seed system, aiming to identify internal structural problems.

The actors comprise individuals or organisations and include the private and public sectors, civil society, and smallholder farmers. The actors are responsible for knowledge generation and research diffusion, i.e., the private and public sectors responsible for breeding and delivery of varieties to farmers, who learn by doing. The public sector includes government ministries and departments associated with seed system regulation, and the private sector includes seed companies entering the formal system, agro-dealers, seed out-growers, and farmers. Actors interact, formally through networks or informally through farmer-to-farmer knowledge-sharing platforms. Interaction is necessary for knowledge purification, sharing, and as a learning process.

Institutions comprise the rules of seed sector reform; for Malawi, these include the National Seed Policy of 2018 and associated legislation aimed at shaping the behaviour of actors. Similarly, rules, whether formal (laws, policies, legislation) or informal (values and norms), have the potential to determine actor interactions and associated system infrastructure (Daum et al., 2025). Furthermore, institutions provide direction and guide investments that support innovation system progress (Daum et al., 2025; Mazzucato et al., 2019). For seed system innovation to progress, investments in certification and quality control, variety release and registration, and sanitary and phytosanitary measures are essential. In addition, the development of procedures, guidelines, accreditation, and offices to regulate actors participating in each of these formal seed system technical areas is important. For the above to operate, there is a need for infrastructure in the form of financial and human resources that are vital for the success of the formal seed system. Lack of or inadequate infrastructure would hamper the successful promotion of an innovation (Jayne et al., 2023). For instance, studies have reported



delays in varietal development and delivery to farmers, resulting in increased breeding costs and reduced adoption of high-yielding varieties (Marechera et al., 2016).

Table 1. AIS components and their functions in technology promotion

Structural Components	AIS Functions	Role
Actors	Entrepreneurial activity	Firms use knowledge to develop and introduce innovations to the market
	Knowledge development	Learning by doing or through research
	Knowledge diffusion	Information and knowledge exchange among actors
	Guidance of the search	Articulation of expectation and preferences/signalling
	Legitimacy creation	Dealing with resistance to change by powerful stakeholders/societal norms and beliefs and legal challenges
Institutions	Rules of the game	Regulation of actors
Interactions	Knowledge development / Knowledge diffusion	Learning by doing or through research / Information and knowledge exchange among actors
Infrastructure	Resource mobilisation	Allocation of financial and human resources

Source: (Vermunt et al., 2022)

Hence, by situating the research questions within broader AIS theoretical debates, the study enhances understanding of how formal seed system components such as institutions, actors, interactions, and infrastructure have developed under the reform process in Malawi (Table 1). Specifically, the paper investigates how the reforms have shifted smallholder farmers' seed-sourcing patterns between formal and informal systems, as influenced by regulatory service provision and seed availability in the market. The subsequent sections present the study's methodology, results, discussion, and conclusion.

Methodology

This study examines seed system reform in Malawi from 2004 to 2024, with data collected using a mixed-methods approach combining grey and academic literature, stakeholder workshops, secondary data, and focus group discussions (FGDs). First, a review of grey literature was used to identify key actor networks within the Malawi seed sector. The identified key actors were invited to a one-day workshop on "Knowledge and Information Sharing on Challenges being Faced in the Seed Sector", attended by five participants representing the private and public sectors, as well as farmer organisations, on 26 February 2021, which provided data on systemic challenges following seed sector reforms. Workshop participants shared their experiences with implementing seed sector reforms, including service provision related to the certification process, seed quality and availability, challenges with legal and institutional frameworks, and trends in certified seed adoption.

The second part involved compiling available seed in the market for the selected crops using secondary data from the Seed Trade Association of Malawi and the estimation of subsidised maize seed requirements between 2009 and 2024 (Benson et al., 2024).¹ This was followed by an analysis of smallholder farmers' seed-sourcing patterns by comparing formal and informal sources using four Integrated Household Panel Surveys (IHPS) large datasets between 2004 and 2020 (Table 2), compiled by Malawi's National Statistical Office (NSO) with support from the World Bank (NSO, 2020; World Bank, 2018). IHPS are nationally representative data where two-stage stratified (urban and rural) sampling was used, with more than 80% of the sample coming from rural areas. IHPS data from the agriculture questionnaire module covering the most recently completed

¹ <https://seedtrademalawi.com/2016/05/25/malawi-seed-traders-ready-to-adopt-biotech/>

primary rainfed cropping season (October to April) were used. Specific data included land productivity for major crops, including sources of inputs such as seeds. IHPS data on farmers' seed sources during the most recent rainy season were utilised for this study.

Table 2. IHPS 2 to 5 household sample frame

IHPS ID	Year Data Collected	Number of Enumeration Areas Sampled	Sample Households per Enumeration Area	Total HH Sampled	Interviewed Households (percentage)
2	2004-2005	564	20	11,280	95.5
3	2010-2011	768	16	12,288	99.9
4	2016-2017	779	16	12,480	99.7
5	2019-2020	768	16	12,288	93.0

Note: For IHPS data collection purposes, Malawi is divided into enumeration areas using data from the most recent Housing and Population census.

The seed sources were categorised into formal sources (traders, Agriculture Development and Marketing Cooperation [ADMARC], subsidy, or private company) and informal sources (cooperative or association, NGO, own seed, local leader, local market, or relative).

Third, qualitative data on the formal seed system's reform status were collected through focus group discussions with seed multiplication farmer groups selected from Salima, Dedza, and Ntcheu districts to triangulate study results (Table 3). The districts were chosen based on previous programmes supporting community seed multiplication by the public and private sectors, academia, government, and non-governmental organisations (Phiri et al., 2004). Farmer groups were purposefully selected in collaboration with field extension staff from relevant district agriculture offices. Focus group discussions with these farmer groups were conducted using a guided open-ended questionnaire in February 2021. The first five seed multiplication groups had irrigation facilities to supplement rain-fed production, whereas the last participant relied solely on rain-fed agriculture. The FGDs aimed to assess farmers' perceptions of the technical and financial support for their seed production activities, as well as the availability, diversity, and quality of certified seed on the market. Being seed producers and consumers, and having interacted with key stakeholders, multiplication groups were expected to offer a fair perspective on the sector's reform status and impact. Each interview began with a briefing to respondents on the purpose of the interview and a request for their consent to participate, which was obtained before their signature.

The secondary data from IHPS were analysed in SPSS using cross-tabulations and descriptive statistics. Cross-tabulations revealed the relationship between two categorical variables: seed sources and the types of crop seed in Malawi. This was based on counts or percentages (table cells) of individual preferences for different seed sources by crop, with the margins indicating the total counts. The analysis results are displayed in percentage clustered bar graphs. For primary qualitative data, interpretive analysis in NVivo 11 involved coding and the development of themes. The study faced limitations in obtaining data on the role of smallholder seed multiplication schemes and national annual seed requirement estimates, which the government no longer provides.



Table 3. Focus group discussions from selected districts in Malawi

Farmer Group Name	FGD Participants (Male/Female present)	Membership (Male/Female total)	District	Actor Involved	Year Started	Crops Produced
Lower Ganya Association	5 M, 1 F	17 M, 6 F	Ntcheu	Panar Seed Limited, Bayer Malawi, Cotton Ginners	2005	maize, cotton, groundnuts, soybeans, cowpeas, sweet potatoes
Cotton Farmers Association	2 M, 1 F	–	Ntcheu	Department of Agriculture Research Services	2016	cotton
Lifidzi Cooperative	4 M, 0 F	37 M, 28 F	Salima	Association of Smallholder Seed Multiplication Action Group, Agriculture Commodity Exchange Group, Lilongwe University of Agriculture and Natural Resources ²	2017	maize, millet, sorghum, groundnuts
Ngodzi Farmers Association	4 M, 1 F	260 M, 110 F	Salima	World Vision International	2004	maize, groundnuts, pigeon peas, cowpeas
Bwanje Water Users Association	8 M, 2 F	980 M, 1200 F	Dedza	Department of Agriculture Research Services	1999	maize, rice, beans, cowpeas, sweet potatoes
Commercial Farmer	1 M, 0 F	–	Dedza	Panar Seed Limited	1980	maize

² Association of Smallholder Seed Multiplication Action Group stopped operating in 2019 after the adoption of the HSR policy.

Results

The following sections present the study results. First, the formal seed system legal and institutional frameworks, including key actors, their interactions, institutions (rules of the game), and infrastructure (human and financial resources), are identified. Then, implications of the recent formal seed system policies on crop seed availability in the market (quantities) and diversity are outlined. Finally, a description of the shift in seed sourcing by smallholders between formal and informal channels is presented before discussing the results and concluding the paper. Qualitative data from focus group discussions and stakeholder workshops have been used to triangulate the study results.

The Formal Seed System Legal and Institutional Framework

For each structural component in Table 1, an analysis of actor networks, roles and interactions, institutional framework status, financial and human resources, and the policy environment was undertaken alongside pointing out barriers to the effective implementation of the formal seed system. At the SADC and COMESA levels, the HSR technical agreement's objective was to improve seed security through regional trade integration with streamlined variety release and registration, certification and quality control, and quarantine and phytosanitary measures. At the national level, the Malawi government aimed to develop the national regulatory framework, enhance seed quality, develop an internationally accepted certification system, and support the domestic seed industry. This resulted in the growth of Malawi seed sector actor participation, including civil society, academia, farmer organisations, and the private and public sectors (Appendix A). The identified seed sector actors linked to the policy process and implementation are organised into two networks: policy advocacy and seed trade. These networks support the formal seed sector by developing appropriate legal and institutional frameworks, and later support the implementation of policies in favour of the formal seed system.

Actors in the Formal Seed System

First is the seed trade network, established in 2004 and affiliated with the African Seed Trade Association, which aims to promote the formal seed system based on the UPOV-91 convention. The association was founded to serve the interests of the private sector, including expanding the regional market through support for Malawi's seed sector policy reforms towards SADC and COMESA harmonised seed regulations. It is the main body representing private seed companies in Malawi, with objectives such as connecting seed companies with the Ministry of Agriculture, shaping policies, promoting certified seeds, supporting seed certification, and ensuring seed quality and standards. The seed trade network collaborates with the Seed Services Unit (SSU) within the Department of Agricultural Research Services to support seed certification and quality control in the formal seed system. The Seed Services Unit is responsible for registering seed crop producers, verifying seed sources, conducting field inspections, seed sampling and testing, checking field plots, monitoring selling points, and providing advisory services. Moreover, the network has implemented programmes to address persistent challenges such as seed counterfeiting resulting from stockouts, discretionary government export bans on grain that included seeds, poor timing of government seed estimates and procurement, and low adoption of certified seeds. Consequently, the network acts as a technical and policy knowledge broker, linking research and policymakers. Funding for the seed trade network comes from membership fees paid by more than 25 seed companies, donor funding, fundraising activities, and the annual registration of over 700 agro-dealers.

Second is the policy advocacy network, founded in 2001 as a coalition of local and international civil society, farmer organisations, and interested individuals working in agriculture to engage the state on policy issues. The policy advocacy network supported government policy processes and dialogue, informing decisions aimed at improving the food, agriculture, and natural resource sectors in Malawi through accountability, transparency, capacity building, institutional development, policy research, learning, sharing, communication, and member engagement. The network lobbied, advocated, and engaged the government for inclusive agriculture sector policies, including seed sector reforms. Its approach was based on farmers' rights to ensure equitable



distribution of germplasm benefits. This led to contention with the seed trade network and government, which promoted breeders' rights in line with UPOV-91. With support from the Development Fund of Norway, the Global Forum on Agricultural Research, and the Food and Agriculture Organisation of the United Nations, the policy advocacy network developed capacity and lobbied for farmers' rights based on the International Treaty on Plant Genetic Resources for Food and Agriculture. The goal of the network was to secure the inclusion of farmers' rights and seed sovereignty in seed sector policies in Malawi.

The policy advocacy network has been operating across thematic areas such as access to profitable markets, livestock, aquaculture, dairy development, and resilient, nutrition-smart agriculture. These align with five strategic pillars: accountability and transparency, capacity building and organisational development, policy research and analysis, monitoring and evaluation, and communication and engagement. The network has conducted multiple advocacy and lobbying activities concerning farmers' rights, including stakeholder conferences, position papers, and engagement with parliamentary committee members on agriculture and natural resources. However, the adopted formal seed system policies have not addressed the policy advocacy network's concerns and interests raised earlier. Limited research capacity, declining funding for advocacy programmes, and low membership fees have impacted the policy network's cohesion and its ability to achieve its objectives.

Institutional Development in the Formal Seed System

Policy inertia caused by contestation has impeded and delayed vital investments in Malawi's formal seed system regulatory frameworks by both the government and the private sector, creating challenges for the seed sector (Table 4). Key to effective regulation has been the postponed establishment of the national seed commission and plant breeders' board due to a lack of funding mechanisms. This has led to weak regulatory controls, limited enforcement of certified seed quality standards, manipulation or tampering with seed samples for testing, alteration of confidential seed documents, misleading advertisements, and the spread of misinformation. This is in addition to missing strategies such as a lack of national variety registration and information systems and national seed reserves, which have resulted in poor information flow among the government, seed companies, and farmers. Furthermore, the private sector reported high costs of variety release, registration, and maintenance in regional catalogues, affecting local seed companies.

The private sector has attributed the high costs to declining government investment, bureaucracy, lack of capacity, and infrastructure, which lead to low participation of local companies, poor-quality seeds, and a corrupt certification process. Further, private seed companies have deplored the poor business operating environment in Malawi, including challenges with pricing in the seed sector as a result of counterfeiting from shortages of quality seeds and stockouts, delayed payments to government subsidy seed suppliers, risks associated with agro-dealers, high costs of imported production equipment and packaging materials (including seed labels and certificates), and limited financing opportunities. Hence, national data indicate low seed production volumes due to the limited availability of various seed classes, such as parental lines, pre-basic, basic, and certified seeds, especially for crops other than maize. In addition to failure to supply adequate seed quantities nationally, these challenges have affected Malawi's participation in regional trade, where seed export volumes from the country have been small, inconsistent, and mostly controlled by multinational companies (USAID, 2016).

Table 4. Status of prerequisite institutions, infrastructure, and actions for HSR implementation in Malawi

Formal Seed System Technical Area / Relevant Legislation	Prerequisite Infrastructure / Actions	Status	Responsible Actor / Functions
Seed certification and quality assurance / Seed Act of 2022	Seed Commission/Centre/Unit	Not established due to lack of funding mechanism	Department of Agriculture Research Services, Private Seed Companies, Agro-dealers, CGIAR Centers; Entrepreneurial activity, knowledge development, knowledge diffusion, guidance of the search, legitimacy creation, resource mobilisation
	Register of seed inspectors, samplers, and analysts	Not established	
	Crop Specific Certification and Quality Assurance Guidelines	Not developed	
	International Organization for Standardization (ISO) Certified Laboratory	Not established	
	Seed Labels and Certificates	Not in use	
	Quality Declared Seed	Recognised	
	Accreditation to International Seed Testing Association (ISTA)	Accredited	
	Accreditation to OECD	Not accredited	
	Revised Seed Act	Enacted in 2022	
Seed Regulations	Reviewed in 2018		
Variety release and registration / Plant Breeders Act of 2018	Accreditation to International Union for the Protection of New Varieties of Plants Convention (UPOV)	Not accredited	Department of Agriculture Research Services, Private Seed Companies, CGIAR Centers; Entrepreneurial activity, knowledge development, knowledge diffusion, guidance of the search, legitimacy creation, resource mobilisation
	Variety Release Committee	Not established	
	Variety Catalogue	Under development	
	Guidelines for Distinctiveness, Uniformity and Stability and Value for Cultivation and Use	Not developed	
	Plant Breeders' Rights Office and Fund	Not established due to lack of funding mechanism	
Sanitary and phytosanitary (SPS) measures / Plant Protection Act of 2018	Plant Protection Office	Understaffed	Department of Agricultural Research Services, Private Seed Companies; Entrepreneurial activity, legitimacy creation, resource mobilisation
	Pest List	Updated	
	Phytosanitary Regulations	Under review	
	Plant Quarantine Regulations	Under review	
	SPS Compliance	Not achieved	
	Sanitary and Phytosanitary Standards	Not developed	
	Aflatoxin Research	Under development	
	SPS Committee	Established	

Source: Adapted from Hunga et al. (2023b)



On the investment side, public finance allocation for agricultural research in Malawi has been shrinking over the years. For example, user fees, which are vital for regulatory services in Malawi, remained low at 1.7% of agriculture research funding from 2012 to 2014. During this period, over 30% of the agriculture research budget was derived from development partners. To put this into perspective, by 2014, public agricultural research funding accounted for less than 1% of agricultural GDP, which is below the minimum of 2% recommended by the New Partnership for Africa's Development and the United Nations. Seed sector actors have also reported other limitations, including a lack of infrastructure and equipment such as transport, laboratories, and warehousing facilities. This has affected seed certification, sanitary and phytosanitary measures, border inspection, and seed movement.³

For seed producers, it has been difficult to access certification services recently. We plant our seed, but inspectors may not visit sufficiently to complete the certification process. Consequently, we have sold the uncertified seed locally as grain. This has impacted our seed production business. At times, we have also faced challenges with contracts between us and seed companies, universities, and CGIAR Centres, mainly concerning the pricing of the seed once produced.

In terms of human resources, public agriculture research staffing measured in full-time researcher equivalents has dropped below 50, with over 40% holding only a bachelor's degree (Flaherty and Kamangira, 2014). Confronted with understaffed public research services, private seed companies reported hiring para-seed inspectors to improve service delivery. These include the 142 para-seed inspectors trained by USAID for internal quality control, but they have no mandate to certify seed. The private inspectors supplement the work of 25 public seed inspectors who are trained and licensed for certification. The actors observed that several other key positions are also understaffed within the public sector, including seed analysts, seed inspectors, seed samplers, scientists, laboratory technicians, and plant health inspectors.

Certified Seed Availability: Quantity by Crop Type

The average availability of certified seed in Malawi from 2009/10 to 2020/21, relative to national seed requirements for key food and cash crops, has been low (Figure 1). Using Malawi Government (2024) national seed requirement estimates, the available certified seeds in the study period averaged 47% for maize, 1% for rice and sorghum, 10% for groundnuts, 6% for beans, 4% for pigeon peas, and 18% for soybeans. The available certified seeds were enough to cover just 0.11% of the three million hectares under the rainfed crop system in Malawi. The low availability of improved seeds persists despite the 2018 National Seed Policy and related legislation, which aimed to enhance seed quality and availability by improving national production and facilitating regional trade. The limited availability of improved seeds has impacted the Malawi government's export strategy, which identified legumes (groundnuts, soybeans, and pigeon peas), cotton, rice, and oil crops as key exports and essential for national food security.

For instance, cotton, the fourth-largest export crop after tobacco, sugar, and tea, has faced challenges due to increased government interference in pricing. This has resulted in only one seed company being involved in limited local production of certified seed, while largely relying on imports. Despite being expensive, the imported cottonseed has been of poor quality with low germination rates and inferior cottonseed for the market, leading to a decline in productivity from 100,000 MT in 2012 to 15,000 MT by 2017 and further down to 10,000 MT by 2023. The Cotton Farmers Association groups commented that:⁴

We used to buy cottonseed from companies that would bring it within our community. The companies have since closed, but their seed was expensive and of poor quality, with low germination rates and yield. Since then, we have worked with the Department of Agriculture Research Services, which supplies us with basic cottonseed for multiplication. This seed is then sold to members of our association. However, after production, ginning companies buy our cotton at very low prices.

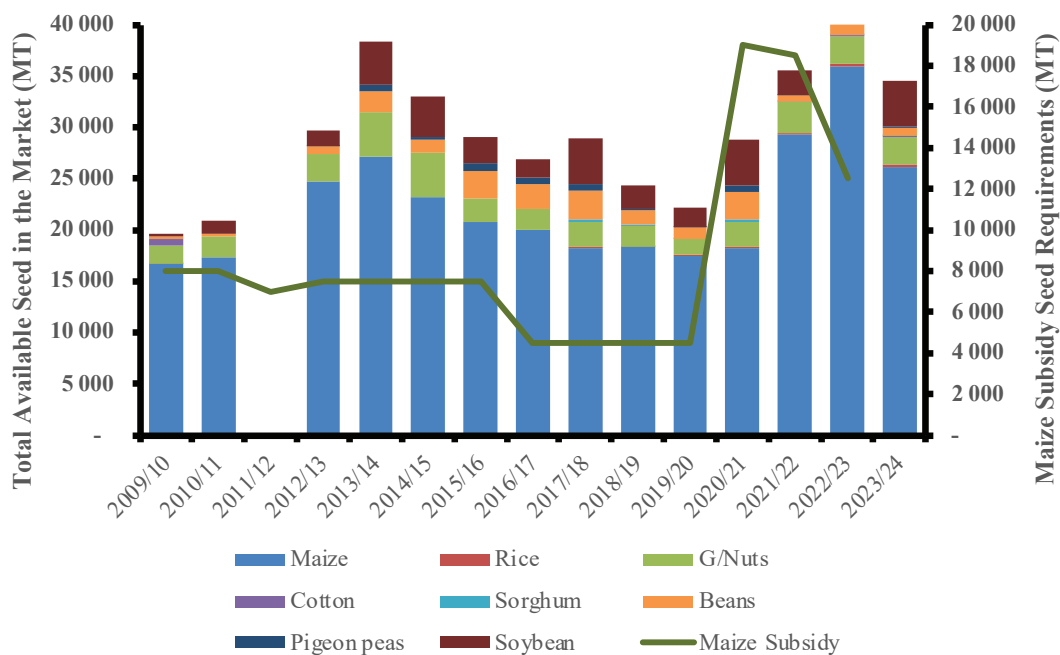
³ Workshop with key actors in the seed sector (26 February 2021)

⁴ Interview with Cotton Seed Association in Ntcheu (February 2021)

Similarly, rice, an important food and cash crop in Malawi, has also suffered from a lack of improved-quality seeds, including aromatic preferred varieties (AICC, 2019). Hence, the recent increase in crop production, including rice, has primarily resulted from land expansion rather than the adoption and use of improved high-yielding varieties. Thus, the study results show that the private sector has failed to provide the much-needed improved seed for various essential crops besides maize.⁵

During the irrigation season (after the rains), we have been unable to get certified seeds from the market for the major crops we produce: maize, sugar beans, and rice. For maize and beans, more than 90% of us scheme members recycle seeds or purchase them from the community or local markets. We work with the Department of Agriculture Research Services for rice, which supplies us with foundation seed and technical services for multiplication, and this is sold to scheme members.

Figure 1. Available certified crop seeds in the market in Malawi, and subsidised maize seed requirements between 2009 and 2024



Data source: Own calculation based on Benson et al. (2024) and Seed Trade Association of Malawi⁶ *Note: No data for the years 2011/12 on available seeds in the market.*

Other challenges affecting seed production include a lack of foundation seeds for maize, groundnuts, beans, and soybeans. Reports indicate that multinational seed companies can produce foundation seed for maize, whereas national seed companies rely on public cultivars. However, there are difficulties in promoting cultivars developed through public research, including open-pollinated crops like legumes, which have underdeveloped value chains and face restrictions on intellectual property rights. Certified maize seed is the only crop available on the market in larger quantities compared to other crops. More than 60% of certified maize seed in the market is sold under the government subsidy programme.

Changes in Smallholder Farmers' Seed Sourcing Patterns

The IHPS results show a reduction in the share of the formal seed system as a source of seeds for households from ADMARC (a government company), cooperatives/associations under the smallholder seed multiplication scheme, traders, private companies, government subsidies, and NGOs in the 2004/05 season, to sourcing from the informal system (own seed, relatives [neighbours, lead farmers, and the community], local leaders, and local markets) by the 2010/11, 2016/17, and 2019/20 farming seasons (Figure 2). Until 2004, ADMARC and its

⁵ Interview with six seed multiplication groups and workshop with seed sector actors (February 2021)

⁶ <https://seedtrademalawi.com/2016/05/25/malawi-seed-traders-ready-to-adopt-biotech/>



subsidiary, the National Seed Company of Malawi (NSCM), played an essential role as formal seed sources. However, ADMARC and NSCM's role as significant formal seed sources (production and distribution) was progressively curtailed during the full implementation of seed sector reform and privatisation. A significant shift began ten years after the Malawi government committed to implementing the Structural Adjustment Program in 1994, which included divesting publicly owned companies in the agriculture and seed sectors. Within the same period, the role of smallholder seed multiplication schemes diminished due to the adoption of a new, stringent seed sector policy that did not support the less stringent quality-declared seed class.

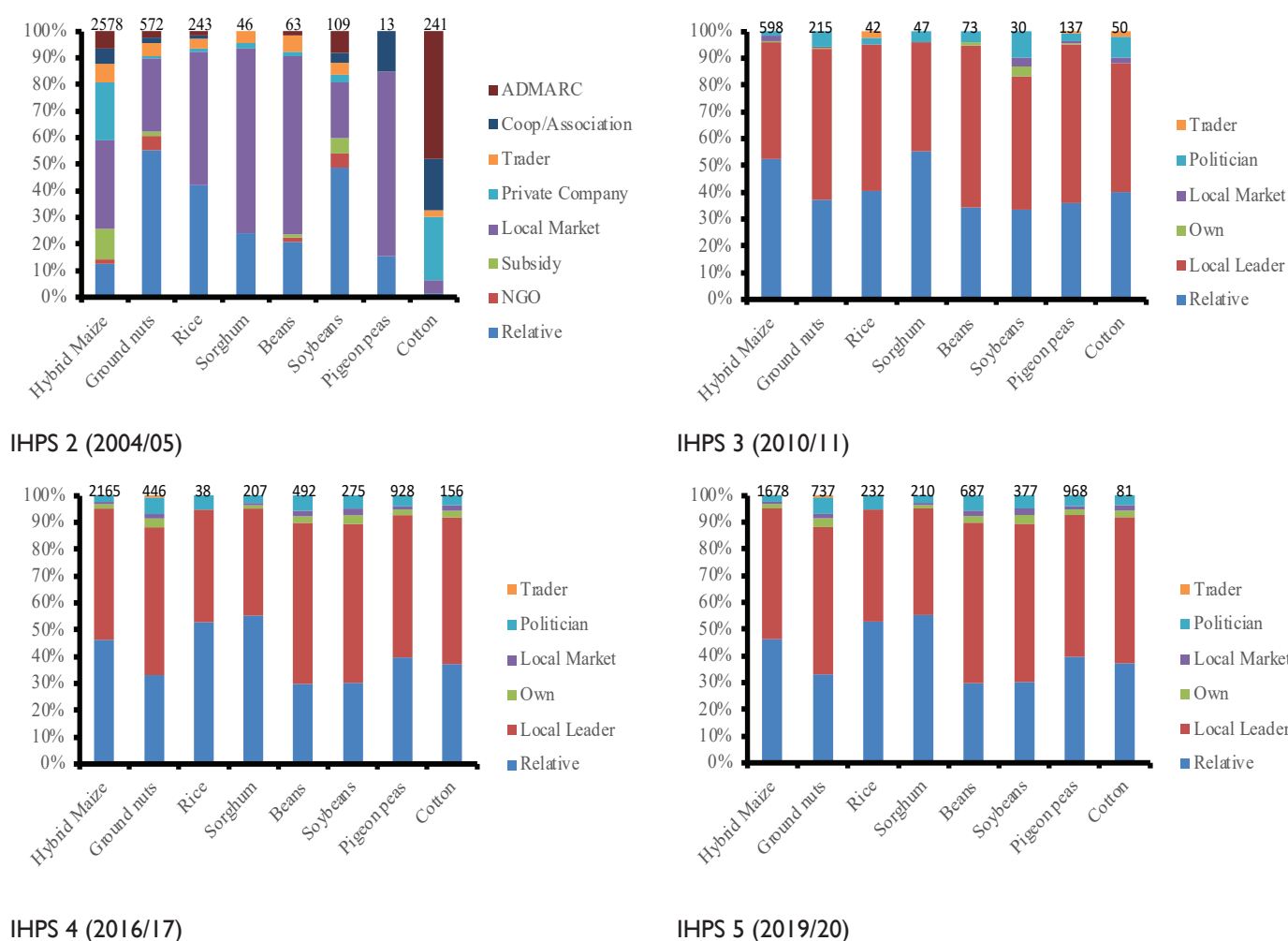
The reform period and the period after privatisation have been marked by several government interventions undertaken to fill the gap left by ADMARC. These efforts have focused on developing appropriate regulatory policy instruments and building the capacity of the private sector to play a more significant role in input supply. This resulted in the establishment of the Seed Trade Association of Malawi in 2004 to promote the formal seed system based on the UPOV-91 convention (ACB, 2018). The association was founded to serve private sector interests, including regional market expansion through support for Malawi's seed sector policy reforms towards SADC and COMESA harmonised seed regulation (Buanec and Heffer, 2002; GRAIN, 2005). This is the mother body of private seed companies in Malawi, whose objectives include linking seed companies with the Ministry of Agriculture, contributing to policy formulation, fighting counterfeit seeds on the market, promoting high-yielding varieties, supporting the seed certification process, and ensuring seed quality and standards.⁷ However, privatisation resulted in reduced public spending and an increased role for the private sector in research, which affected public breeding. Hunga et al. (2023a) have detailed Malawi's seed sector development and policy process since pre-colonial times.

Regarding private sector capacity, the United States Department of Agriculture and the World Bank initiated agribusiness investments to improve certified seed distribution. The interventions aimed to enhance the entrepreneurial skills of agro-dealers (private seed traders or outlets) to become technology transfer agents, support improvements in the policy environment, facilitate improved access to finance, establish regulatory systems for inputs, improve technical and business skills, and establish a market information system. These efforts have led to a significant increase in the number of seed companies, from two in 2004 to over 25 by 2024, and input agro-dealer outlets, which have increased to over 700 (Traders). However, the increase has created regulatory challenges resulting from limited infrastructure growth.

Bayer Malawi and Seed Company of Malawi, multinational companies, dominate the seed market share, primarily supplying hybrid maize, which accounts for the majority of farm seed input subsidies in Malawi. Private seed companies and agro-dealer networks remain the backbone of the seed production and distribution system, which is regulated by the Seed Services Unit and Seed Trade Association of Malawi. However, much has yet to be achieved in terms of seed availability (quantity), access (cost and distance to markets), and utilisation (acceptable quality). Stockouts in the market, failure to regulate the expanding private sector, and the gap between demand and supply have compromised seed quality, creating opportunities for counterfeiting. The above challenges have impacted access to high-quality certified seeds for smallholder farmers in Malawi through the formal seed system.

⁷ <http://www.seedtrademalawi.com/about/objectives>

Figure 2. IHPS 2 to 5 smallholder farmers' seed sources for eight crops in Malawi.



Data Source: Own calculation based on Malawi Living Standard Measurement Survey-Integrated Household Panel Surveys 2 to 5. Note: For IHPS 2, ADMARC, Trader, Private Company, and Subsidy represent formal seed sources, while Cooperative/Association, NGO, Relative, and Local Market represent informal seed sources. For IHPS 3 to 5, Traders and Politicians represent formal seed sources (primarily from government subsidies), while Local Market, Own Seed, Local Leader, and Relative represent informal seed sources. NGOs supported cooperatives/associations under the smallholder seed multiplication schemes. At the top of each bar are the total participants involved for each crop.

The current rate of increased use of high-yielding certified seed among smallholders, especially maize, has been linked to the reintroduction of government input subsidies in 2005. As a result, over 80% of hybrid seed, mainly maize, is accessed through the farm input subsidy programme, followed by NGOs via direct seed distribution, commercial farmers, and less than 3% of smallholder farmers using their own funds.

We (more than 90% of FGD participants) buy our seed from the informal seed system, with the formal system supplying largely subsidised seeds through the government programme. We cannot use our own money to buy certified seeds from traders because we are not sure of the quality of the seed, which has low to zero germination rates, does not perform as labelled, is too expensive to justify investment, and we do not trust the formal seed system outlets, which are temporary (mobile) and lack a guarantee. We have discovered that legumes from agro-dealers, specifically groundnuts and soybeans, are the most severely affected, often resulting in zero germination rates. Similarly, our seed multiplication activities have faced challenges ranging from contractual issues, mainly pricing, to lack of technical support from the Department of Agricultural Research Services.”⁸

The FGD participants' observations align with the IHPS results, which indicate that, on average, 48% of sampled households benefited from the government-subsidised maize seed programme between 2005 and 2020 (Table 5). However, the number of beneficiaries has declined from 75% to 10% within the same period.

⁸ Interviews with six seed multiplication groups (February-September 2020)



This has led to an average of 30% of households in the IHPS sample purchasing seed with their own resources, and over 87% using seed from informal sources, including their own stock. Despite the reduction in the percentage of farmers receiving coupons, there has been no increase in those buying certified seed using their own resources.

Table 5. Percentage of households accessing seed and other economic services

Description	IHS 2 (2004/05)	IHS 3 (2010/11)	IHS 4 (2016/17)	IHS 5 (2019/20)
Agricultural and livelihood activities				
Household used own seed last season	0.682	0.907	0.932	0.972
Household bought seed without coupon	0.314	0.275	0.311	0.316
Households received coupon for seed	0.75	0.156	0.139	0.098
Access to agriculture credit	0.231	0.111	0.266	0.31
Access to agro-dealers	0.191	0.307	0.199	0.296
Household cultivated land (ha)	1.008	1.057	1.03	0.799
Large ruminant livestock	0.062	0.085	0.059	0.064
Small ruminant livestock	0.213	0.207	0.231	0.199
Poultry	0.543	0.607	0.606	0.632
Average Tropical Livestock Units*	0.556	0.393	0.335	0.522
Markets and infrastructure				
Access to ADMARC**	0.167	0.186	0.233	0.207
Access to local weekly market	0.321	0.385	0.334	0.411
Distance to local market (km)	19.11	16.45	34.16	38.89
Distance to road network (km)	40.344	43.05	57.92	68.65
Distance to district centre (km)	41.816	41.24	37.51	40.45

Data source: Own calculation based on Malawi Integrated Household Surveys 2 to 5

*TLU and Wealth Index were calculated based on Hockett and Richardson (2016), Jahnke et al. (1988)

**ADMARC is a government-owned input and commodity marketing institution.

On the other hand, the subsidised seed quantities are small; each benefiting household is allowed to purchase 5 kg of maize seed and, in some seasons, 2 kg of legume seed. This quantity of maize seed purchased per household is insufficient to cover all landholdings, which averaged 0.8 hectares in 2020, resulting in overlapping seed sources. Politicisation, inflated procurement costs, and targeting challenges have impacted the efficiency of the subsidy programme and its ultimate goal of reducing poverty and increasing productivity. Poor-quality seeds, high prices, and a lack of trust in the agro-dealer network, without a grievance redress system at community level, have resulted in farmers not investing their own resources in certified seeds. Access to agro-dealers is at 30% and to local markets at 41%, at an average distance of 40 km. These challenges affect the use of high-yielding varieties despite households owning other productive assets—i.e., at least 7% own cattle, 21% keep small ruminants (goats and sheep), and up to 60% rear poultry—which have been used as a coping mechanism during food-lean periods and as a way of paying for inputs.

Discussion

This study investigates the impact of seed system reforms in Malawi through the domestication of the harmonised seed regulations technical agreements into national policy and legislation. This has seen changes in service provision within the seed sector, including the availability and diversity of seeds in the market, and how the reforms have influenced smallholder farmers' seed-sourcing patterns between formal and informal systems in Malawi. Based on the Agricultural Innovation Systems framework, the study used secondary data and information and primary data collected through focus group discussions with seed multiplication groups and a workshop with key stakeholders in the seed sector.

The Road to Effective Seed System Reform

The process of reforming the formal seed system has been long and ambiguous due to contestation over farmers' rights, until 2022 when all relevant legislation was enacted. This was preceded by the launch of the National Seed Policy in 2018 and government support for private sector-led seed sector development, resulting in the cessation of pluralistic seed sector development that supported the informal seed system. However, observations indicate that there have been challenges with the establishment of relevant organisations, procedures, and guidelines to support the operationalisation of formal seed system policies in Malawi. Where new policies are adopted, there is a need to establish new structures that would support the implementation of intended interventions (Oliveira and Faria, 2017).

Key to the operationalisation of formal seed system policies is the National Seed Commission, responsible for enforcing the Seed Act of 2022 through certification, quality control, and regulatory activities such as training and licensing seed inspectors and analysts in both public and private sectors (Malawi Government, 2018). The absence of the commission has placed pressure on the understaffed Seed Services Unit within the Department of Agricultural Research Services, affecting the quality of services and seeds in the market. Reports indicate that where certification is under the public sector, service provision has been below par (Maereka, 2020). The other missing structure is the Plant Breeders' Department, headed by a Registrar within the Ministry of Agriculture, to register plant breeders, seed examiners, assessors, and inspectors, and maintain a plant breeders' rights register.⁹ There are reports of challenges in operationalising these two structures, largely due to ineffective funding mechanisms where user fees are inadequate, and neither the government nor the private sector is covering the costs (Hunga et al., 2023a).¹⁰

The lack of requisite structures within the reformed seed sector has affected human capacity development and financing investments to support the growing private sector participation. It has also affected the development of relevant procedures and accreditations for regionally acceptable certified seed production and trade. The lack of institutional structures has also resulted in costly and lengthy variety release processes (Mabaya et al., 2017). The lack of effective certification and variety release processes under the reformed seed system have affected quality signalling and trust among farmers, affecting adoption and investment in improved seeds. This has resulted in the enforcement of social certification, where seeds are sourced locally from the informal seed system (Sperling et al., 2020b; Sperling and McGuire, 2010). To improve seed quality in the market, there are government initiatives to secure the seed value chain using scratch card labels, online seed verification, licensing of seed sellers, transporters and inspectors, financing for seed growers and companies, and an online agro-dealer database. However, limited funding and adoption by seed companies of these initiatives affect the objective of improving the tracking and tracing of seeds along the value chain.

Seed Production and Market Availability

Seed production and distribution have faced a myriad of challenges. These include a non-functional variety release process, inadequate quality assurance for early generation seeds (EGS), insufficient regulation of the

⁹ <https://faolex.fao.org/docs/pdf/mlw219484.pdf>

¹⁰ https://www.aripo.org/storage/resources-member-state-laws/1674820317_phpJSH7VV.pdf

private sector, poor communication among seed extension players, poor seed distribution due to a lack of infrastructure, and a lack of procedures for certification of other crops. For example, in 2015, there was a shortage of foundation seeds: 939 MT for beans, 788 MT for groundnuts, 142 MT for peas, 87 MT for soybeans, and 54 MT for cowpeas (USAID, 2016). This challenge has previously been reported to result in inadequate certified seed supply, as in 2000, when shortfalls were reported in Malawi: 22,269 MT for maize, 16,046 MT for beans, 3,644 MT for soybeans, and 9,474 MT for groundnuts (Ng'ambi and Maliro, 2003). The trend persisted in 2010, with certified seed shortfalls of 7,733 MT for maize, 2,371 MT for beans, 8,584 MT for soybeans, and 16,175 MT for groundnuts (Mloza-Banda et al., 2010). A similar trend was observed between 2020 and 2022 (Figure 1), where national seed requirements were 44,046 MT for maize, 21,363 MT for beans, 25,408 MT for groundnuts, 14,390 MT for soybeans, 7,389 MT for rice, 6,504 MT for pigeon peas, and 2,920 MT for sorghum, far above available seed in the market (Malawi Government, 2024). In addition, reports indicate that private sector breeding programmes are biased towards maize, as shown by the varieties released since 2000: 91 for maize, 4 for groundnuts, 15 for beans, and 3 for soybeans (Mabaya et al., 2017).

Hence, regardless of seed sector reform and advocacy for privatisation and regional trade, seed shortages have persisted in Malawi. Poor communication and information sharing on national seed production and demand, often made available to seed suppliers late in the season, has affected both seed and grain movement and depressed prices and farmers' earnings. This results in production challenges associated with the lack of basic and foundation seed, as well as technical production hitches, i.e., contractual difficulties between seed out-growers and companies. The lack of foundation seed has been the major limiting factor for seed production in Malawi, especially for open-pollinated crops, as private seed companies have been reluctant to take them on board. One reason has been the government's unwillingness to sell the intellectual property rights of publicly developed cultivars to private seed companies, which has affected their promotion. Furthermore, the open-pollinated varieties market is highly underdeveloped as farmers can recycle seed, and high seeding rates make them unaffordable to most users (ICRISAT, 2017).

Impact on Seed Sourcing Patterns by Smallholders

Seed quality challenges, the need to diversify, and the impact of climate change have led farmers to maintain informal seed sources. Trusted sources under the informal system have included relatives, neighbours, lead farmers, and the community, where social certification is used to observe and build trust in cultivars. This was the signature of the now-extinct smallholder seed multiplication schemes in Malawi that played an essential role in seed circulation by supplying diverse and high-quality seeds. The discontinuation of the smallholder seed multiplication schemes in 2019 has been inappropriately attributed to their limited knowledge of seed production and processing, as well as the failure to repay loans. However, the ban is firmly linked to the new seed policy, which does not recognise the informal seed system (Malawi Government, 2018). The policy is based on the SADC and COMESA's harmonised seed regulation (HSR) technical agreements. Under the HSR, seed security is based on local production and the potential for seed movement across countries, driven by economies of scale and comparative advantage for seed companies (ICRISAT, 2017). However, data on seed imports into Malawi are not readily available.

Other factors that have influenced seed sourcing from the formal system include low purchasing power (in the long term), droughts (in the short term), and uncertainty over seed quality (Chirwa and Dorward, 2013; McGuire and Sperling, 2016; Sperling et al., 2020a). Low-quality inputs have led to yield gaps and hindered smallholder farmers' adoption and investment in certified seeds (Bulte et al., 2023). Evidence has been documented on the extent of counterfeiting and its effects on farmers' perceptions of certified seed (de Boef et al., 2014; Derwisch et al., 2016). An evaluation of Malawi's small and medium agribusiness enterprises found poorly performing inputs, including seeds, due to tampering, dilution, and substitution along the value chain (USAID, 2014).

Conclusion

As highlighted earlier, Langyintuo et al. (2010) at the regional level, and Simtowe et al. (2016) at the national

level, have questioned the formal seed system, particularly the private sector's ability to supply farmers with adequate high-quality improved seeds. This is despite the privatisation and adoption of new policies in the seed sector aimed at increasing the availability of and access to high-quality certified seeds. This can be linked to the growth of the private sector, which has occurred without equal investment in regulatory institutional frameworks and procedures, for instance, certification processes for crops other than maize. Furthermore, the absence of the National Seed Commission and Plant Breeders' Office has resulted in low staffing levels, limited infrastructure and equipment, and failure to attain OECD accreditation and update regulations and standards, affecting local seed production and cross-border trade. The lack of regulatory structures has affected farmers' trust in certified seeds on the market.

Furthermore, seed production in the formal system has been hindered by a shortage of staff and a lack of foundation seed, which has impacted seed multiplication. Consequently, there has been limited availability and diversity of crop seeds on the market, making farmers continue to rely on the informal system. Limited information on national seed requirements and production has again affected effective planning along the value chain. This has been compounded by private seed companies' interest in hybrid maize seed over other crops. Hence, FGD farmer groups' experiences in Salima, Dedza, and Ntcheu indicated increased seed costs from the formal system without guarantees on quality.

Poor quality and unavailability of seeds have significantly influenced the choice of seed source, with farmers opting for informal sources where prices are low, allowing them to bargain, barter, or obtain loans, pay in kind, and trust seed quality through social certification. Hence, financial and technical support is necessary for both formal and informal seed systems to achieve complementarity and support high-quality seed movement. Support for the informal seed system may not suffocate the formal system, but it could be used to promote new varieties to farmers and communities. This is now imperative, as under climate change, farmers' interests lie in crop diversification, where the informal seed system has supplied a wide range of crop seeds. This may necessitate a review of current policies to address the challenges facing regulatory services within the formal seed system. The policy review may consider supporting other seed classes, such as less stringent quality-declared seed and true-to-type seed. Therefore, there is a need for further studies on these seed classes and how they could be best revamped, both technically and financially. This study contributes to the literature on seed sector development in the region and Malawi, providing insights for future review of contemporary seed sector policies.

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Appendix A: The Malawi Seed Sector Organisations

Network	Members	Type of Organisation
Seed trade	Agriculture Research and Extension Trust	Parastatal
	CIAT	CGIAR
	Demeter	Seed company (national)
	Funwe	Seed company (national)
	Global Seeds	Seed company (national)
	ICRISAT	CGIAR
	IITA	CGIAR
	Multiseeds	Seed company (national)
	National Smallholder Farmers Association of Malawi	Farmer organisation
	Pannar	Seed company (international)
	Peacock Seeds	Seed company (national)
	SeedCo	Seed company (international)
	Bayer	Seed company (international)
	Panthochi	Seed company (national)
	Department of Agriculture Research Services	Government
	Seed Trade Association of Malawi	Secretariat
	ASSMAG	Seed company (national)
	MUSECO	Seed company (national)
	Policy advocacy	African Initiative for Corporate Citizenship
National Smallholder Farmers Association of Malawi		Farmer organisation
District councils		Government
Farm Radio Trust		NGO
OXFARM		NGO
Total Land Care		NGO
CARE Malawi		NGO
Action Aid		NGO
Farmers Union		Farmer organisation
Save the Children		International public
HIVOS		NGO
Civil Society Agriculture Network	NGO	