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EDITED BY

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Admire Katunga,
Ministry of Agriculture, and Food
Security, Malawi
Stacia Nordin,
NeverEndingFood Permaculture, Malawi
Martin Prowse,
University of East Anglia, United Kingdom

*CORRESPONDENCE

Henry G. Hunga
✉ henryhunga@gmail.com

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The seed sector development in low-income countries: Lessons from the Malawi seed sector policy process

Henry G. Hunga ^{1,2*}, Levison Chiwaula³, Wapulumuka Mulwafu⁴ and Mangani Katundu⁵

¹Faculty of Social Science, The University of Malawi, Zomba, Malawi, ²Department of Land Resources Conservation, Ministry of Agriculture, Lilongwe, Malawi, ³Department of Economics, The University of Malawi, Zomba, Malawi, ⁴Vice Chancellor's Office, Mzuzu University, Mzuzu, Malawi, ⁵Department of Human Ecology, The University of Malawi, Zomba, Malawi

Introduction: External conditionalities have shaped public policy development in borrowing nations. This has been through top-down policy support programs, an example being the policy reforms under the structural adjustment program. Under the seed sector reforms Malawi committed to the Southern Africa Development Community and the Common Market for Eastern and Southern Africa harmonized seed regulations technical agreements.

Methods: To contribute to the debate, we analyzed the Malawi seed sector policy process by investigating three questions: What were the leading events? Who were the stakeholders involved, and their roles? Which factors influenced the policy process? Qualitative tools were employed based on policy process theory using the Kaleidoscope Model. We used stakeholder inception, planning, feedback workshops, and key informant interviews ($N = 17$). This data was complemented by grey literature as secondary information. Snowball sampling was used to identify key informant interview participants based on the saturation principle. Narrative analysis focusing on content, structure, and dialogic context was used.

Results: Our results show a strong external influence on the seed sector policy process. This began after independence when development partners supported the establishment of the public agricultural research system to improve production for food security and export. Failure to achieve the earlier objectives resulted in economic reforms aimed at private sector-led seed sector development based on market-oriented policies. The increase in the private sector's role called for adopting and enacting regulatory policies and legislation that used policy transfer theory. International financial institutions, multinational companies, and regional economic communities led this process. Our evidence suggests that the civil society community in Malawi contested the policies for not recognizing farmers' rights. This affected the domestication process of the harmonized seed regulations technical agreements.

Discussion: Therefore, we recommend critical consideration and embracing of existing domestic social, political, and technical conditions to support economic policy reforms. This would help reduce unintended consequences and improve inclusivity. Governments may need to play an interlocutory role for the various actors in the policy domain during the domestication process.

KEYWORDS

conditionality, seed system, policy transfer, regional economic community, Kaleidoscope Model, domestication

1. Introduction

The recent debate on food security has dwelt much on trade, production, crops, and technologies with limited emphasis on seed security, where interest has been restricted to regulatory frameworks (Sperling and McGuire, 2012). This has happened at the expense of the policymakers, practitioners, and researchers, who long agreed on the importance of seed security in achieving food and nutrition security, improving agriculture and livelihoods, biodiversity, and germplasm conservation (Coomes et al., 2015). The shift from technical to political discussion in the early 1990s was a follow-up to biotechnology and the need to protect intellectual property rights (Buanec and Heffer, 2002). This saw transnational organizations, associations, and agreements playing a significant role in putting the private sector's ideology on the formal seed system (Buanec and Heffer, 2002). In this article, the seed system includes any person or organization involved in breeding, selection, development, production, multiplication, processing, storage, diffusion, distribution, and marketing of the seeds (Almekinders and Louwaars, 1999; Muthoni and Nyamongo, 2008; Munyi and De Jonge, 2015). Cromwell et al. (1992) defined a formal seed system as a framework of institutions linked together by their involvement or influence in the production, processing, and supply of high-yielding varieties (HYV). It is governed by laws and policies to protect farmers and genuine seed producers against counterfeit seed suppliers (Almekinders and Louwaars, 2002). Therefore, policy in this article includes the availability or lack of legislation, regulations, intervention, or decisions implemented within society to improve social wellbeing (Sabatier, 2007).¹

Formal seed sector development initiatives in Africa expanded after the independence movement in the 1950s aimed at public research development and production of HYV of selected crops to replace informal seed system (Croft et al., 2017). This resulted in the adoption of seed certification procedures by governments for quality assurance modeled on developed countries' (Remington et al., 2002). This also included strengthening agricultural infrastructure adopted from the colonial governments, including research, extension, and supporting institutions (Gilbert et al., 1994). During this time, development partner support was meant to build state capacity in agriculture research and extension to support the nascent formal seed system (Louwaars and de Boef, 2013). Later, seed laws started diffusing into Africa from developed countries regulating the certification procedures, seed-testing, phytosanitary measures, and variety release and registration (Bombin-Bombin, 1980). However, global implementation of the seed laws has not been standardized for instance in the western countries it has mainly been under the private sector while it had remained under the public sector in developing countries (Tripp, 1995). Hence, in most African countries and for most crops, the formal seed system did not develop as expected, with the informal seed system still playing a significant role (World Bank, 2008; Smale et al., 2013).

Beginning 1980s, structural adjustment programs (SAP) perceived public service provision as costly due to the "debt crisis" and represented the most significant global economic reform (Silva et al., 2010). Under SAP, the International Monetary

Fund and World Bank used conditional lending to transfer policies from countries that had adopted and succeeded with market-based growth strategies to those using welfarist policies (Collier and Gunning, 1999). Agriculture was one of the sectors in Malawi that underwent the reforms to increase returns for smallholder farmers, eliminate consumer price subsidies, introduce exchange and interest rate adjustments, increase fees for public utilities and services, cut public expenditure, and increase research and extension support (Lele, 1987). This happened under the World Bank's strategy on rural development to reduce poverty, improve wellbeing, and eliminate hunger with the private-sector-led production, input supply, processing, and marketing (World Bank, 2000; van der Meer, 2002). However small fragmented country markets were not attractive for the private sector hence the birth of regional integration drive through the Regional Economic Communities (RECs) (Golit and Adamu, 2014). And this formed the basis for the Common Market for Eastern and Southern Africa (COMESA)-Southern Africa Development Community (SADC)-East African Community (EAC) Tripartite Free Trade Area (COMESA TFTA) that included harmonized seed regulations (HSR) for streamlined laws, marketing, and removal of barriers for breeding, production, and distribution (Gaffney et al., 2016).

However, recent studies have disputed the flawed way consultants and think tank networks were used as purification tools to legitimize liberalization and privatization of the public sector (Gendron et al., 2007; Jupe and Funnell, 2015). Many studies have found negative impacts on public service provision and increased poverty attributed to the reforms (Shandra et al., 2011; Coburn et al., 2015; Pandolfelli et al., 2016; Thomson et al., 2017). Thus, although SAP sets the economic development parameters within developing countries' productive and social sectors, their impact on the policy process has not been clear (Thomson et al., 2017). For instance, the SAP reforms have been affected by schisms between development partners and governments, policy reversals by recipient countries, and piecemeal policies (Zhenwei and Kusek, 2020). However, the studies listed above have used policy theory to describe assumptions and ascribed values limited to the policy impact (Breton and De Leeuw, 2011). This study, therefore, goes beyond that using policy process theory to investigate three questions on the seed sector development in Malawi:

1. What were the events (chronology) leading the seed sector development?
2. Who were the key actors and their roles?
3. What were the factors that determined the policy process?

SAP approach was based on policy transfer used as a quick fix by replicating best practices from one jurisdiction into another with an interest in market-based policies (Walker, 2017). Transnational spaces have supported this policy process through agenda setting and transfer agents purifying the policy knowledge (de Oliveira and Pal, 2018). Hence, this study used the Kaleidoscope Model (KM) inductively built from academic and donor understanding of parts of the policy transfer process in developing countries (Resnick et al., 2018). The study used Malawi and the seed sector, but the results and method are transferrable to other countries or other development sectors. Malawi has two legal documents:

¹ <https://www.cdc.gov/policy/analysis/process/definition.html>

The act—enacted by parliament addressing major political and social issues and Regulations –approved by Ministers or Cabinet addressing more nuanced issues like application, the management or administration (Mloza-Banda et al., 2010).

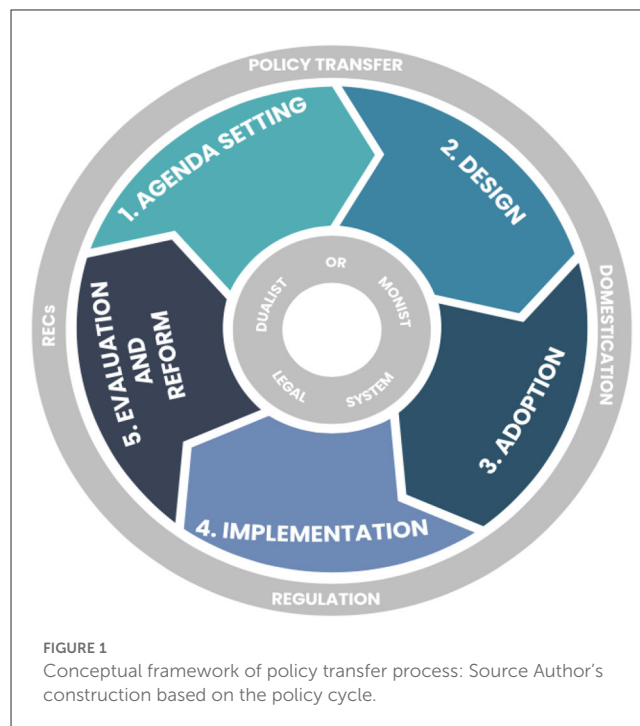
2. Conceptual framework

To understand the political economy of the seed sector development in Malawi, we employed the policy transfer theory (Weyland, 2011; de Oliveira and de Faria, 2017). The theory dates back to 1889, with recent research from the 1990s due to liberalization, globalization, and the information communication technology growth (de Oliveira and de Faria, 2017). Policy transfer is where knowledge about policies in one jurisdiction is used to develop policies and associated institutions in another as a quick fix to problems (de Oliveira and Pal, 2018). This has resulted in policies moving quickly between governments, i.e., conditional policy reforms, cash transfers to more than fifty countries, participatory budgeting, and the recent farm input subsidy program in most African countries (Perk and Theodore, 2015). Policy transfer has been driven by international economic competition, external pressure from financial institutions and donors, normative imitation, rational learning from other countries, and cognitive heuristic under limited decision-making conditions (Simmons and Elkins, 2004). International organizations through global conventions, i.e., World Health Organization's Tobacco Control, the Organization of Economic Cooperation and Development's (OECD) seed certification standards, international treaties and agreements, international events, i.e., on climate change, and RECs have been active in policy transfer across jurisdictions (de Oliveira and Pal, 2018).

Figure 1 presents a conceptual framework for policy transfer where problems go straight into the agenda-setting or design stage. But based on “evolutionary” policy theory, policy transfer denotes a complex process (Cairney, 2012, 2013). This results from gaps between the policy environment and the policymakers and discrepancies between the global agenda and country implementation (Mamudu et al., 2015). This is based on the lack of understanding or disregard of the evolutionary theory by transnational institutions when setting the agenda for countries with different political, social, and legal environments (Cairney, 2012). Where receiving country's legal, political and social systems have determined the policy domestication process under conditional policy reforms, i.e., monist where they are self-executing, or dualist where they are not legally binding (Matemba, 2011; CARL, 2012). Hence domestication process has affected the use of policy transfer as a quick fix to global problems.

2.1. The formal seed system in Malawi: Background

The Malawi formal seed sector has grown significantly and was recently valued at US\$26 million, ranked 9th in Africa and 4th in COMESA (Mukuka, 2014). This performance mostly came from the increased role of the private sector, mainly supplying dent hybrid maize through the government-supported subsidy program



(Kuhlmann, 2015). This has seen the formal seed system actors increase from 2 seed companies in the early 1990s to more than 24 by 2017 (Mabaya et al., 2017). However, certified seed adoption and usage have averaged 14% and 30% for legumes and maize, respectively (Lunduka et al., 2012; Simtowe et al., 2016). Regarding breeding, interest has been in maize as shown by varieties released since 2000, 91 for maize, 4 for groundnuts, 15 for beans, and 3 for soybean (Mabaya et al., 2017). Nevertheless, the private sector has not met the demand for HYV seed by farmers in Malawi (USAID, 2016). The supply gap and increased agro-dealers selling HYV have resulted in an upsurge of counterfeit seeds in the market (Derwisch et al., 2016). Hence, the informal seed system has remained an essential source of seed and planting materials providing more than 80% of smallholder farmers' requirements (Lunduka et al., 2012). Further evidence indicates that the informal seed sector has improved food security by providing drought-tolerant and resilient seed materials unavailable from the formal seed system (CEPA, 2012; AGRA, 2015). But government interest and support have been toward the formal seed system by developing favorable policies and technical support (Kugbei, 2003).

3. Methodology

We employed the Kaleidoscope Model based on the policy process theory described by Breton and De Leeuw (2011). The KM revolves around 16 testable variables that influence the policy reform (Haggblade and Sureh, 2017). Three KM tools were used for this study (Resnick et al., 2018): first, we developed a detailed chronology of events, second isolated key stakeholders and their roles, and third identified the KM variables that influenced the policy process. This study formed part of the Building Research Capacity for sustainable water and food security in drylands

of sub-Saharan Africa (BRECCIA) project in Malawi.² Data was collected using workshops as a participatory tool and key informant interviews. At the beginning of the BRECCIA project, a 2-day national stakeholder's inception workshop was conducted in October 2018. The workshop attracted 55 representatives from academia, public and private sectors, civil society, media, farmer organizations, and national research institutions. The goal was to assess stakeholder needs and priorities for research capacity building in food security. This was achieved through three consecutive sessions that named drylands and their challenges, assessed the existing policy frameworks and gaps, and listed potential research and capacity-building areas. Participants named the Malawi seed sector policy process as one of the areas requiring research as the country was aligning with the HSR. A 1-day workshop followed this on "Participatory Research Development and Planning of BRECCIA Project Activities in Malawi" in February 2020, attended by 25 participants from the public and private sectors, non-governmental organizations (NGOs), and civil society involved in the seed sector. The workshop participants reviewed the study design and tools and recommended a first list of stakeholders for further engagement. The final workshop in December 2020 was on "Sharing of Preliminary Results Through Evidence-Based Policy Briefing" attended by 11 participants from policy research institutions and academia. Workshop participants shared their feedback on the policy brief based on their inclination, roles, goals, preferences, and concerns around the Malawi seed sector policy process.

Insights from the first two workshops supported and guided the identification of initial organizations for key informant interviews (KII) from national key stakeholders ($N = 17$). These included research institutions, public and private sectors, policymakers, implementing institutions, civil society, NGOs, farmer organizations, and policy think tanks. KII data was collected between March and June 2020. Responses were recorded on individual questionnaires. To understand the Malawi seed sector policy process, areas probed in the questionnaires included: critical events, i.e., were earlier policies reviewed? What was the policy development approach used? What was the feeling of the process? Who are the actors involved and what roles (technical, financial, advocacy, policy entrepreneurs, or coordination)? And what has been the external or domestic influence (supporters, opposition)? Further KII participant identification used snowball sampling based on the saturation principle and non-probabilistic sampling to identify a representative sample (Saunders et al., 2018). At the beginning of each interview, participants were briefed on the study's objectives and their expected role and impact before signing a consent form. And each interview lasted an average of 1.5 h. Further, secondary information was used from gray literature like technical and workshop reports, policy documents and briefs, position papers, and media articles. The workshop, KII, and secondary data analysis helped with the triangulation, validation, and streamlining of study results' understanding through qualitative narrative analysis focusing on content, structure, and dialogic context (Nightingale, 2020). In the end hypothesis testing of the 16 KM variables was done

and their proximate influence on the seed sector policy process was identified.

4. Results and discussion

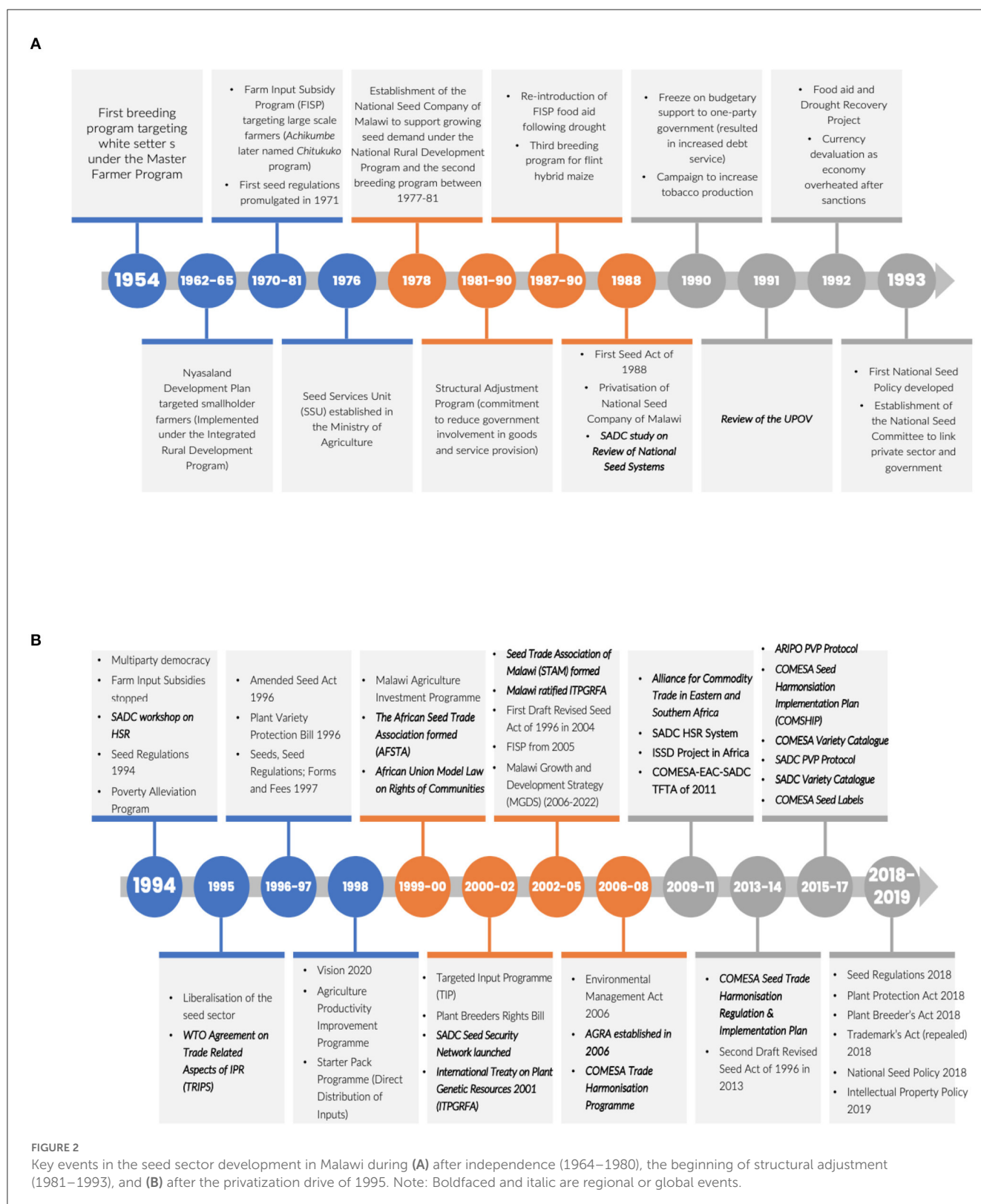
This section presents the study results in three parts: A detailed chronology of the key events; The stakeholders involved and their roles; and a detailed list of the factors that influenced the policy process along the policy cycle.

4.1. Malawi seed sector development: A chronology of events (1964–2019)

Figure 2 shows the timeline of the key events pre- and post-Malawi's independence in 1964. Post-World War II challenges, the 1949 famine, and the preparation for full economic responsibility of the Nyasaland Protectorate (Malawi after independence) singled out agriculture as the most significant sector (Kettlewell, 1965). As such, the British Colonial Government funded the development of agriculture through the Master Farmers' Scheme project between 1950 and 1962 (Kalinga, 1993). The project targeted large-scale settler farmers and smallholder farmers with the potential of graduating into the Master Farmers (Alumira and Rusike, 2005). The program supported export crops like cotton, coffee, tea, and tobacco, with maize production left to smallholder farmers (Smale, 1995). Malawi being a Protectorate and not a colony had gaps in its legal framework and institutions that affected the enhancement of the collective capacity of settler farmers to influence research development, production, and marketing policies (Alumira and Rusike, 2005). As such, the first breeding program led by the colonial government started with maize in 1954, followed by other crops like groundnuts, rice, cotton, and tobacco in readiness for independence (Cromwell and Zambezi, 1993). However, after independence, the nationalist government briefly abandoned the Master Farmer program in preference for an inclusive Integrated Rural Development Program (IRDP) under the Nyasaland Development Plan of 1962 (Kalinga, 1993). The IRDP adopted mass agricultural research and extension targeting smallholders, developed rural infrastructure and human resources, and established supporting public enterprises (Gilbert et al., 1994). IRDP preserved the agriculture research infrastructure inherited from the colonial government. However, the breeding program was affected by a lack of suitable germplasm for flint lines, low staffing levels, limited funding, and lacked sustainability (Smale, 1995). These challenges resulted in the failure of the smallholders to increase exports resulting in a perpetual trade deficit affecting IRDP implementation and the breeding program was abandoned in 1967 (Mkandawire, 1982).

At this point, the IRDP was reviewed and the government reverted to the pre-colonial "Master Farmers" policy renamed *Achikumba* "progressive farmers" and later *Chitukuko* "development process" (Smale, 1995). This time the government opted to import dent hybrid maize seed from Southern Rhodesia (Zimbabwe after independence) while breeding export cash crops locally for the large-scale farmer's (Kydd, 1989). *Chitukuko* targeted indigenous business people, politicians, public employees,

² <https://www.gcrf-breccia.com/>



holding companies, and parastatals to invest in agriculture through priority access to land, extension services, credit, production of high-value crops, and subsidized inputs (Anseeuw et al., 2016). Agricultural Development and Marketing Cooperation

(ADMARC), a government parastatal, the Ministry of Agriculture (MoA), and commercial banks funded and subsidized the *Chitukuko* program (Mhone, 1992). This saw an increase in agriculture-based export income from 30% in 1964 to 80% by

1980 due to increased government support and favorable global commodity prices (Pryor, 1988). It was an important achievement as agriculture accounted for 55% of the Gross Domestic Product (Mkandawire, 1982). With this growth of the agriculture sector, the government adopted the first hybrid maize seed Rules and Regulations in 1971 and established the Seed Services Unit (SSU) in 1976, responsible for the seed quality control (Ng'ambi and Maliro, 2003). However, increased importation cost of seeds and sanctions on Zimbabwe led to the second breeding program in 1977 (Smale, 1995). Until this time MoA research funding was 8% on maize, 22% on cotton, 17% on horticulture crops, and 15% on rice (Cromwell and Zambezi, 1993). These developments supported the National Rural Development Program (NRDP), launched in 1978, to promote soil conservation, provide small seed packages, and research and extension for the *Chitukuko* farmer's (Mkandawire, 1982). NRDP increased demand for the seed that ADMARC failed to meet (Cromwell and Zambezi, 1993). To complement ADMARC government established the National Seed Company of Malawi (NSCM) and later introduced the Smallholder Seed Multiplication Scheme (SSMS) to reduce seed production costs and encourage crop diversification (Cromwell and Zambezi, 1993). But the long break between the first and second breeding programs created gaps in human resources and knowledge and skills hence it quickly collapsed (Smale, 1995).

The support through input subsidies for *Chitukuko* farmers was curtailed by SAP implemented in 1981 (Cammack et al., 2010). SAP implementation removed subsidies, stopped import-substitution, and removed the rent-creation and selective distribution earlier promoted (Anseeuw et al., 2016). Subsidy removal affected dent maize seed demand, subsequently ADMARC and NSCM business and adoption of HYV (Smale and Heisey, 1994). This resulted in the third breeding program from 1987 with technical support from The International Maize and Wheat Improvement Center (CYMMYT) that took the flint maize traits long demanded by smallholder farmers (Smale, 1995). Within 3 years, two flint hybrids, MH12 and MH17, with local maize grain texture and yielding just as dent hybrids, were developed (Smale and Heisey, 1994). This increased hybrid maize seed adoption and crop area by five times by the mid-1990s (Sauer and Tchale, 2009). NSCM, ADMARC, and the MoA propelled the maize revolution (Chinsinga, 2010). However, privatization that started in 1988 affected this progress due to operational changes (Chinsinga, 2010). Privatization resulted in the government enacting the first Seed Act in 1988 and establishing the National Seed Committee to regulate the private sector (Mloza-Banda et al., 2010).³ Within the same period as a result of increased droughts and famine the government re-introduced subsidies targeting 2.8 million affected people (GRAIN, 2010). Support for disaster (drought and floods) affected families continued into the 1990s creating demand for seed and private sector interest (Smale and Heisey, 1994).

³ Replaced the National Seed Technology Working Committee, and its functions were extended to livestock, soil fertility, farm machinery, and plant protection, among others.

4.2. The actors involved in the Malawi seed sector development

Malawi policies have been influenced by external conditionalities first the 1960s when the World Bank and the United States Agency for International Development (USAID) promoted macroeconomic stability and policy incentives (Resnick et al., 2015). This was building on the British colonial Government initiated programs in Malawi that responded to food security and economic challenges (Kettlewell, 1965). During this time government, with financial and technical support from USAID, Commonwealth and Development Cooperation, and Food and Agriculture Organization of the United Nations (FAO), developed agriculture research and extension, human resource, and infrastructure to support the formal seed system (Ng'ambi and Maliro, 2003). Further with this support, the International Seed Testing Association accredited the SSU and established a Seed Certification and Quality Control Unit to support the formal seed system development (Ng'ambi and Maliro, 2003).

SAP represented the second and most significant policy conditionality that dismantled the public sector led by the International Monetary Fund and the World Bank through policy reforms after the debt crisis (Resnick et al., 2015). Although Malawi Government committed to the SAP reforms, the early process was slow due to indecisiveness and piecemeal policies (Chirwa et al., 2008). Seven years later, the Malawi Government partially privatized NSCM, with Lever Brothers joining the seed sector in 1991 (Chinsinga, 2010). However, SAP implementation resulted in quick gains in the research and extension approach funded by the World Bank (infrastructure development), USAID (human resource development), CYMMYT (provision of germplasm for flint maize), and Non-Governmental Organizations (backstopped farmer-managed seed systems) that now supported smallholder farmers (Smale, 1995). This marked the beginning of reduced funding for public agriculture research as the interest of both government and development partners was toward supporting the developing private sector. There was a reduction in government support for small-scale seed multiplication schemes that were key in producing legume seed and open-pollinated varieties within communities (Cromwell and Zambezi, 1993). Some of the public funding and support removed during this time included access to credit, training, and marketing for small-scale seed producers. This saw the growth of seed out-grower contract farming primarily undertaken by commercial farmers and seed companies (KIT, 2020). The private sector's promotion of genetically modified organisms (GMOs) perceived as commodification created anxiety within government and civil society in the seed sector (Mataya, 2006).⁴ Within this period, Malawi's seed sector developed a strong network in the civil society (CEPA, 2010). This followed the beginning of the global seed activism for farmers' rights aimed at counteracting the private sector push for intellectual property rights for breeders (Peschard and Randeria, 2020). As the government controlled the seed sector, its stand was in line with the SADC-level discussion, which was still technical to

⁴ <https://cepa.rmportal.net/Library/biodiversity/Say%20no%20to%20Genetic%20Engineering%20in%20Malawi.pdf>

improve the production and distribution (van der Meer, 2002). Studies by CYMMYT on the disadvantages of local maize in terms of the long growing season, low grain-to-stock ratio, and low yields were used by policymakers to promote certified HYV (Simtowe et al., 2010).

4.2.1. Privatization of the seed sector

Malawi's return to multiparty democracy in 1994 fast-tracked privatization in line with the government's shift in economic development policy to the poverty alleviation (Harrigan, 2003). This resulted in a radical transformation of the seed sector and increased private-sector participation (Zerbe, 2001). Around the same time, biotechnology and patenting had increased the private sector's interest due to prospects for profit (Peschard and Randeria, 2020). The changes led to a significant policy and regulatory review resulting in the first seed policy in 1993, the Seed Act of 1988, amended in 1996, and the drafting of the Plant Breeder's Rights (PBR) Bill in 1996 (CEPA, 2010).⁵ The amended Act and new policy regulated seed production, sale, exportation and importation, certification, registration of seed testers and producers, licensing of seed inspectors, and declaration of prescribed seed (Nakhumwa and Kaudzu, 2010).^{6,7} The Act also established the Agriculture Technology Clearing Committee (ATCC) that released new varieties, replacing the Variety Release Committee (Nakhumwa and Kaudzu, 2010).⁸ This was the start of the contestation for farmers' rights to be included in the upcoming seed sector policies which affected the PBR Bill enactment biased toward intellectual property rights. The privatization resulted in the market share concentration of multinational companies like Monsanto (now Bayer), Seed Co, Pannar, and Pioneer, supplying 90% of the hybrid maize (Mabaya et al., 2017). Such that civil society was not impressed with the review process that took place and the government's stance on the policy reforms:

“Some of us were consulted, and we wanted farmers' rights to be embraced in the policy reforms. This is important in supporting farmer-managed seed systems and bridging the transition to a formal seed system. In addition, there was a need to improve funding for regulating variety releases by the ATCC, which does not regularly meet, this needed rectification. We also noted the earlier policy supported the setting up of the seed commission, which the government did not. We needed to get to the bottom of these problems for future improvements if the

reforms are to be meaningful. We felt this would increase the ability to regulate the growing private sector whilst supporting the farmer's rights.⁹”

As reported by KII participants, although consultations were undertaken by the new government, resolutions made were not incorporated into the policies and Acts being developed. The events around the reforms affected gains in the adoption of improved seed which dropped and remained at 30% of the country's maize area (Lunduka et al., 2012). This agrees with the criticism of the flawed way consultants and think-tank networks have been used as purification tools to legitimize SAP and the privatization drive (Jupe and Funnell, 2015). There is evidence that the private companies in southern Africa have not been effective in delivering what was demanded of them (Zerbe, 2001; Chinsinga, 2010). Other studies suggest that the private sector has not delivered the required seed quantities, quality, and crop diversity as expected by smallholder farmers (Langyintuo et al., 2010). The recent adoption rates of the certified seeds in Malawi have been associated with the farm input subsidies program expanded in 2005 (Chirwa and Dorward, 2013; Westengen et al., 2019). The subsidies have created further demand for maize seeds and increased private sector interest and role leading to the policy process for the formal seed system (Chinsinga, 2010). Privatization resulted in reduced public spending and the increased role of the private sector in research that affected public breeding. Actor interests shaped the direction of the seed sector policy process in Malawi, where three types of actors can be isolated. The private sector is interested in protecting plant breeders' rights to safeguard investments and is backed by development partners promoting market-based economic policies. Then civil society was the voice of smallholder farmers standing for the underprivileged. Lastly, the government was straddled between the private sector in return for investments and the smallholder farmers for political patronage. With privileged access and links to international organizations, the private sector used political power and connections to lobby behind the scenes for their interests at the highest level of government (Stone, 2004). However, there exist gaps in political economy analysis studies where interest has been in government, international organizations, and non-state actors overlooking the roles of the private sector in the lobbying and policy process (de Oliveira and Pal, 2018).

4.2.2. Domestication of the harmonized seed regulations

After working with individual countries under SAP, there was a shift in the transnational institution's approach to collaborating with RECs and the private sector (Figure 2B). USAID led the policy process through technical and financial support to member states. For Malawi, it started with USAID support in establishing the Seed Trade Association of Malawi in 2004, affiliated with the Africa Seed Trade and America Seed

⁵ Earlier known as Plant Variety Protection Bill and later changed to Plant Breeder's Rights Bill (CEPA, 2010).

⁶ Interview with Seed Services Unit (04/03/2020).

⁷ Variety registration and certification were compulsory for maize, tobacco, and sunflower only (GRAIN, 2005).

⁸ Previously known as Variety Release Committee (VRC) comprised of Department of Agricultural Research, Department of Crop Production, Agricultural Research and Extension Services, Tea Research Foundation, Pesticides Board of Malawi, National Commission of Science and Technology, and the University of Malawi. Interview with World Vision (28/02/2020); (Mloza-Banda et al., 2010).

⁹ Interview with senior officials from farmer organizations, CSOs, research institutions, NGOs, and the public sector.

Trade Associations (ACB, 2015).¹⁰ This followed the growth of the private sector that ignited the discussion on seed security toward harmonized seed regulation (Rohrbach et al., 2003; Mulesa, 2021). The aim was to address fragmented country markets, differences in variety release and certification systems, uncoordinated phytosanitary measures, lack of intellectual property rights, and the need to improve the supply system (FANRPAN, 2010). Developing the HSR technical agreements was assigned to the Africa Seed Security Network under SADC and the Africa Seed Trade Association, again supported by USAID (Rohrbach and Howard, 2003).

Resolving the challenges identified under HSR happened at three levels. First, at the global level, countries were encouraged to join the International Union for the Protection of New Varieties of Plants (UPOV), embrace plant variety protection consistent with UPOV conventions, amend national legislation in line with the World Trade Organizations' Agreement on Trade-Related Aspects of Intellectual Property Rights and the International Plant Protection Convention of the Food and Agriculture Organization, adopt the Organization for Economic Cooperation and Development Scheme for the Movement of Seed in International Trade, and be accredited by the International Seed Testing Association (Rohrbach and Howard, 2003). This process used carrots and sticks to entice governments to adopt the UPOV 1991 model that formed the basis for HSR agreement (Correa, 2015).

Secondly, was at the regional level through RECs. SADC started following the Regional Review of National Seed Systems in 1988 aimed at improving seed production and supply system (Figures 2A, B).¹¹ Later, this changed to HSR based on consultants' recommendation through the strategic report on SADC Seed System study in 1994. However, the process lacked momentum until USAID supported the SADC Seed Security Network project in Malawi, Mozambique, Zambia, and Zimbabwe in 2000 (GRAIN, 2005). Under the project, SADC agreed on harmonizing three areas: variety release procedures and registration; certification and quality assurance; and sanitary and phytosanitary measures (FANRPAN, 2010). However, the SADC HSR process was long and ambiguous due to member states' disagreements on the plant variety protection (PVP) system and the need to include farmer's rights (Munyi et al., 2016). Hence COMESA took advantage of the delays in SADC and the earlier advances in the HSR technical agreements through its trade harmonization program of 2006 (ACB, 2015). COMESA adopted the SADC technical agreements as the basis for its HSR program (USAID, 2016). And formal collaboration among the COMESA, SADC, and EAC was achieved in 2011 through the signing of the COMESA TFTA comprising 22 countries (Garlińska-Bielawska and Folfas, 2018).¹² Soon after COMESA

launched the Seed Harmonization Implementation Plan supported by USAID supporting member states domestication processes (USAID, 2016). However, the COMESA TFTA implementation was delayed after only 8 out of the required minimum of 14 member states had ratified by 2020.¹³ The other countries protested on rules of origin and non-tariff barriers that favored rich member states (de Jonge et al., 2019; Ndonga et al., 2020).

The third was the domestication process at the national level which has been long and contested. Malawi, using the dualist legal system and a member of both COMESA and SADC, was one of the seven members domesticating the HSR technical agreements (Matemba, 2011; CARL, 2012).¹⁴ Globally, the government was under pressure to domesticate the seed sector statutes as a requirement by the 2012 G8 resolution that called for the revision of national policies to improve investment opportunities to support the growth of African agriculture (FIAN International, 2014). Regionally, the pressure was from SADC and COMESA on their member states who ratified the HSR technical agreements.¹⁵ Interestingly, the government was not committed to protecting plant breeders' rights when there was contestation and a push for farmers' rights by civil society. Malawi's statutes under domestication were the Seed Act, PBR Act, Plant Protection Act, Trademarks Act, National Seed Policy, and National Intellectual Property Policy (Figure 2B). Along this process, civil society felt sidelined and expressed dismay at how the government handled the domestication process:

National stakeholders: "The domestication process was largely coordinated by the Seed Trade Association of Malawi and MoA, which resulted in most decisions favoring the private sector over smallholder farmers. This resulted in the resolutions between the government, the private sector, and civil society not being taken on board in the final decisions. We have observed the government's use of a top-down approach in the consultations and decision-making, which affected the consideration of including farmers' rights and farmer-managed seed systems in the Seed Act or an inclusive PBR. Hence the contestation and disagreement affected the progress of the revised Seed Bill, an important statute in implementing the HSR. The delays in the process have resulted in weak regulatory instruments that are based on the old Seed Act, like small penalties for offenders and a lack of an independent seed commission. Affecting seed quality on the market due to non-objective public certification and limited enforcement of laws resulting in the growth of counterfeit seeds."¹⁶

10 AFSTA, established in 2000 with funding from the United States Department of Agriculture, is affiliated with the American Seed Trade Association (<https://www.betterseed.org/>).

11 Started by the predecessor of SADC, the Southern Africa Development Co-ordination Conference (SADCC) 1980 to 1992.

12 <https://www.comesa.int/more-countries-ratify-tripartite-free-trade-area-agreement/>

13 Tralac, Botswana deposits Tripartite ratification instruments, 05/02/2020.

14 Indication of Legal Instruments to be signed at the 10th Extraordinary Session of the Assembly on the Launch of the AfCFTA, African Union, 21 March 2018.

15 Minutes of the Seed Act Review Meeting, 11/26/2013.

16 Interview with senior officials from farmer organizations, CSOs, research institutions, NGOs, and the public sector.

District councils: “Although not consulted during the recent review and development of the Acts and policies, there have been efforts to brief us on the new seed policy by the MoA and Seed Trade Association of Malawi. But this offers little help as our view and concerns were not incorporated.¹⁷”

The above observations agree with our analysis that showed the Seed Act of 1988 Amended 1996 has undergone three reviews since 2004, with the latest in 2013 because of disagreements on the inclusion of farmers’ rights (Mabaya et al., 2017).¹⁸ The civil society felt that the whole policy had been externally influenced on Malawi from outside institutions interested in the commodification of plant materials using internationalized associations and consultants. This was based on the observation that the reviewed Seed Bill was to rectify shortfalls like optional certification of other crops; provide for the registration of seed importers, cleaners, and sellers; restrict import and export of some crop seeds; provide for deregistration of seed producers; enforcement of PVP; accreditation to OECD certification scheme; recognize other country’s certification; provision for certification funding; and creation of an independent regulatory body and variety release committee (Mloza-Banda et al., 2010).¹⁹ Technically, the enactment of the revised Seed Bill was delayed based on a recommendation from the Ministry of Justice first to review the National Seed Policy of 1993.²⁰ From the consultation side, civil society’s contestation for recognition and protection of farmer’s rights; inclusion of farmer-managed seed system; broad definition of seed; and the need to outline the implications of aligning to the HSR affected progress (Phiri, 2017). A further challenge was licensing publicly developed varieties where the government has been reluctant to offer exclusive rights to private seed companies.²¹ The Acts and policies above are critical to the alignment and implementation of the COMESA TFTA HSR as they support the establishment of relevant institutions. Along the domestication process, the Malawi government did not play an influential interlocutory role in balancing the private sector and civil society interests, which affected the speed and efficiency.

4.3. The KM variables that influenced the Malawi seed sector development

This section summarized the factors responsible for the Malawi seed sector development policy process along the policy cycle

(Table 1). The role of the KM variable on the policy process has been denoted by positive sign if it influenced the outcome, negative if it impeded progress, zero if it was present but without any clear impact, and blank if it was not present at all. The reforms in Malawi resulted from changing information and beliefs (H14) after the monitoring and evaluation of the public seed system done in the early 1990s (Malawi Government, 2010). The multiparty government development agenda was poverty alleviation and the need to adapt to climate change through crop diversification (Ng’ambi and Maliro, 2003). Changing material conditions (H15) i.e., increased incidences of droughts called for crop diversification which required the production of HYV for crops like groundnuts, soybeans, beans, etc. Hence government commitment to the SADC and COMESA TFTA HSR supporting the private sector seed sector development characterized by notable institutional shifts (H16). For instance, the entry of new actors like multinational seed companies, NGOs, civil society, and farmer organizations.

The agenda-setting stage of the seed sector reforms was at the global level where it was clear that there was a recognized relevant problem (H1). This was after governments, including Malawi, noted farmers’ lack of access to high-quality seeds to improve production through the public system. At the international stage, propositions were made by the African Union (AU), which proposed improvement in production and distribution, and the World Bank, which pushed for market-based interventions (OAU, 1980; World Bank, 1981). These conceptions were supported by focusing events (H2) at two levels, at the national level the need to increase production for economic growth and food security, and at the global level due to policy conditionality on macroeconomic and sectoral policy interventions. The latter gained traction as global actors, i.e., international financial institutions, bilateral organizations, multinational companies, and RECs emerged as powerful advocates (H3) for the market-based seed sector reforms. Their influence began in the 1960s with the development partners supporting the government through technical and financial support to develop a public formal seed system. SAP implementation marked a shift from public to private sector-led seed sector development. Hence transnational organizations and associations started lobbying, designing, financing, and supporting the policy processes. With internationalized associations, i.e., the Seed Trade Association of Malawi (STAM), leading the Malawi seed sector policy process.

STAM led the technical studies that formed part of the design stage, purifying and translating policy knowledge (4) and information to justify and guide the reform process in Malawi. At REC and country levels, transnational organizations and associations commissioned several studies. The first regional study was the SADC Review of Seed Systems in 1987, where interest was production and distribution.²² A follow-up Regional Strategy study in 1994 changed the approach to regulation and market interventions.²³ Other studies were interested in member states’ progress, i.e., the Southern Africa Regional Seed Sector Assessment (USAID, 2016). At the national level, the first was the 2004 study on

17 Interviews with senior government officials from three local councils and one Agriculture Development Division.

18 Interview with CISANET (04/03/2020); IFDC and Ministry of Agriculture and Food Security, an assessment of the requirements for establishing a seed regulatory system in Malawi, IFDC managed project: A Market-Driven Approach to Improving Smallholder Access to Agriculture Inputs in Malawi, 2004.

19 Development Fund Norway, An overview report of farmers’ seed systems policy and legislation in Malawi.

20 Interview with senior public officer and a private consultant earlier involved in the review process.

21 Interview with DARS Official (05/11/2020).

22 FANRPAN, The National Planning Workshop on the Harmonized Seed Security Project (HaSSP), Lilongwe, Malawi. 4–6 August 2010.

23 Harmonized Seed Security Project Report implemented in Malawi, eSwatini, Zambia, and Zimbabwe, 2011.

TABLE 1 Variables influencing the Malawi seed sector policy process.

| Policy stage | Variable determining policy process | Policy reform episode | | | Total instances variable was present (percent) |
|---------------------|---|---|---------------------------------------|--|--|
| | | Post-independence (1964 to early 1980s) | SAP period (Mid-1980s to early 1990s) | Liberalization period (early-1990s to present) | |
| Agenda setting | 1. Recognized, relevant problem | + | + | + | 100 |
| | 2. Focusing event | + | + | + | 100 |
| | 3. Powerful advocacy coalitions | + | + | + | 100 |
| Design | 4. Knowledge & Research | | 0 | + | 67 |
| | 5. Norms, biases, ideologies, and beliefs | + | - | - | 100 |
| | 6. Cost-benefit calculations | | | | |
| Adoption | 7. Powerful opponents vs proponents | + | + | + | 100 |
| | 8. Government veto players | + | + | + | 100 |
| | 9. Propitious timing | + | + | + | 100 |
| Implementation | 10. Requisite budget | - | - | - | 100 |
| | 11. Institutional capacity | 0 | + | - | 67 |
| | 12. Implementation stage veto player | 0 | 0 | 0 | 0 |
| | 13. Commitment of policy champions | + | + | - | 100 |
| Evaluation & Reform | 14. Changing information and beliefs | | + | + | 67 |
| | 15. Changing material conditions | | + | + | 67 |
| | 16. Institutional shifts | | | + | 67 |

Positive (+) indicate variable presence with a role in the policy process. A negative (-) indicates that variable presence played a negative role in the policy process. Naught (0) indicates variable presence with no effect on the policy process. Empty cells indicate variable, not present. The last column shows the percentage of variables present, whether positively or negatively affected the policy process in the three policy episodes. Author’s compilation based on Resnick et al. (2018).

the Malawi Seed Act of 1988, Amended in 1996, that proposed its revision as detailed above (Mloza-Banda et al., 2010). To support national debate and knowledge, AU supported the integrated seed sector development project in Malawi and other countries to link formal and informal seed systems and ensure a balanced public and private sector involvement (Louwaars and de Boef, 2013). However, norms, biases, ideologies, and beliefs (H5) existed in the Malawi seed sector reforms. These shaped the development of the seed industry with a bias toward privatization, where government interest has been to increase exports, achieve food security, and benefit from development partners’ direct investment promises. Support from development partners has largely been toward the policy reform process and not the regulation (Westengen et al., 2019).

This made the government overlook the cost-benefit analysis (H6) while pushing for the formal seed sector. Resulting in a limited ability to regulate the growing industry hence increasing counterfeit seeds on the market. A senior public official corroborated the impact of this omission:

“There are challenges on the market that are rocking the seed industry, and that includes: inadequate enforcement of the Seed Act and regulations, which has provided loopholes for

some stakeholders in the seed industry to neglect appropriate standards for seed quality control; growth of the industry and government seed reforms have resulted in the mushrooming of fraudulent seed traders who have sold to farmers sub-standard seed resulting in poor productivity; and lack of internal quality control mechanisms in most seed companies has resulted in the distribution of seeds that are not true to type, with low germination capacity, and reduced vigor, leading to poor productivity and loss of trust on improved varieties by smallholder farmers.²⁴”

Adoption of the policies was delayed due to contestation between powerful opponents and proponents (7) which resulted in the above challenges. The local growth in seed sector actors like NGOs, civil society, and farmer organizations resulted in the push for farmers’ rights and recognition of farmer-managed seed systems. This affected and dragged the policy process, especially the Seed Act, which is central. Such that civil society expressed dissatisfaction with the MoA’s reform process of the seed sector, reporting that:

24 <https://www.mbc.mw/extras/programmes/sunday/item/8051-government-advises-stam-on-seed-insurance>

“As civil society, we have more than once engaged the MoA on the need to include farmer’s rights in the seed policy and Acts being developed. First, we were promised that this would be taken care of in the revised PBR and Seed Bills. Later, the MoA showed that this would be taken into the upcoming revised Environmental Management Act of 2016 which did not happen. As a result, at the last meeting just before the National Seed Policy was launched in 2018, the MoA announced that it will develop a separate policy specifically looking at farmers’ rights. At that point, we knew the battle was lost, and we had concerns: small seed companies would not be able to penetrate the market; failure to protect smallholder farmers would mean losing their landraces; seed banks run by smallholder farmers would become illegal; seed fairs participated by smallholder farmers would be affected, and the new policy will criminalize 90% of farmers most of them, women.²⁵”

Contestation kept the government position shifting, despite a veiled agreement between the civil society and STAM on the need for farmers’ rights based on the stringent UPOV convention.²⁶ But, the government used veto powers (H8) to adopt the strict UPOV HSR policy. This was through propitious timing (H9) when the former COMESA Secretary General, Bingu wa Mutharika, was Chair of the African Union and President of Malawi.²⁷ As African Union Chair, he declared that “no African child should die of hunger” and expanded national successes on food security to the continental level (Juma, 2011). This made improving access to seed through markets a priority for Malawi and most African countries (COMESA, 2016).

However, the Malawi seed sector policies and associated interventions faced implementation challenges. This was due to a lack of requisite budget (H10) that affected agriculture research resulting from a lack of staff and technical limitations (Flaherty and Kamangira, 2014). Dependence on development partners affected sustainability as they later shifted to support the private sector (KIT, 2020). In Addition, delayed enactment of the Seed Act affected the public regulatory body’s institutional capacity (11) by failure to set up a relevant independent seed commission, seed services fund, and a variety release committee. The need to create new institutions in the policy transfer (Thomson et al., 2017) brings challenges like funding lapses because of limited commitment from policy champions (H12). This is because, under regulatory policies, the private sector and government strive to reduce costs, which affects the service provision (Coburn et al., 2015).

5. Conclusion

The seed industry in Malawi is one of the productive sectors whose policies have been influenced by external factors attached to economic growth and development support. This has resulted in peace meal policies and interventions. For instance, breeding programs have been affected by lack of trained scientists, funding,

and favorable germplasm. Largely the breeding programs have been supported by development partners. This is despite Malawi having an agro-based economy there have been inconsistencies in the seed sector development since independence. Although privatization increased the role of the private sector this has seen most of them, especially the multinational companies, streamlining their portfolios to hybrid maize. Having a welldeveloped value chain, limited ability to be recycled, and the ready market through government subsidies has made hybrid maize seeds lucrative at the same time controversial. The shift to a private sector-led seed system has not delivered as expected in terms of seed quantities, quality, and crop diversity. In terms of quantities and diversity, curtailed policy support toward smallholder farmer’s managed seed systems has affected the multiplication of crop seeds not adequately served by the private sector i.e., legumes. In addition, the government’s position on supporting formal seed system only has resulted in reduced NGO support for farmer-managed seed systems. These programs ensured easy access to good quality seeds by farmers and supported the promotion of new varieties. Seed quality has been affected by the lack of adequate regulation as the role and size of the private sector increased. Which has been met with reduced public spending on agriculture research affecting governments’ regulatory role and influence. This time over 70% of the agriculture sector budget is spent on farm input subsidies and <16% on the other technical areas. Delayed enactment of the legislation for the seed sector due to contestation has affected investments toward the regulatory institutional frameworks i.e., the proposed seed commission to ensure adequate and effective enforcement. At the same time, the private sector investment in research and marketing has increased, whilst they are lobbying for policies and institutional frameworks that were long missing in the seed industry.

The birth of seed activism in the early 1980s and the subsequent growth of civil society changed the policy process landscape in developing countries. In Malawi, this protracted the HSR domestication process due to the failure in reaching the middle ground between the private sector’s interest in breeders’ rights and the civil society’s wish for farmers’ rights. This resulted from governments’ failure to bridge the differences that affected the policy process and the high-level lobbying ability and political connections of the private sector. Lack of adequate knowledge and studies on the private sector’s influence on the policy process resulted in a limited understanding of their role. The civil society with the limited human and financial capacity to conduct research and lobby for farmers’ rights in a technical and politically complex policy process faced the wellresourced and connected private sector. Hence, the policy process theory (Breton and De Leeuw, 2011) in this study allowed us to trace the logic of events, identify the key actors and their roles, and isolate the KM variables influencing the seed sector policies in Malawi. We conclude that politics in the policy process through the use of the dualist legal system shaped the domestication process. The domestication environment has proven to be an essential aspect of the policy process as the legislature, public sector, private sector, and civil society have used it to sort out their differences. We recommend that the government should play an interlocutory role in the policy process for inclusive policies and manage unintended consequences. Further, technical and financial support is necessary

25 Interview with Civil Society (04/03/2020).

26 African Seed Trade Association position paper on farmers’ rights.

27 FANRPAN Interview with President of the Republic of Malawi, HE Dr. Bingu wa Mutharika, 5th March 2010.

for civil society that represents the underprivileged in society. Our results and methodology apply to other countries or economic development sectors.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

This study was conducted in line with the guidelines for research ethics of the University of Malawi and Malawi's guidelines for social science research. The application was submitted with the data collection tools to the University of Malawi Research Ethics Committee (UNIMAREC) based on the guidelines. Approval was received from UNIMAREC (No. P.10/19/03) based at the University of Malawi, Zomba.

Author contributions

HH: data analysis, data collection, methodology, and manuscript. LC and WM: manuscript detail. MK: methodology and funding. All authors contributed to the article and approved the submitted version.

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