

RTB Working Paper

Integrating gender into Kenya's evolving seed policies and regulations for roots and tubers

Emmanuel Sulle for International Potato Center

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Integrating gender into Kenya's evolving seed policies and regulations for roots and tubers

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www.rtb.cgiar.org/

Contact:

RTB Program Management Unit
International Potato Center (CIP)
Apartado 1558, Lima 12, Peru
rtb@cgiar.org • www.rtb.cgiar.org

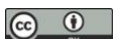
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Acronyms

ASDS	Agricultural Sector Development Strategy
AFSTA	African Seed Trade Association
CIP	International Potato Center
FAO	United Nations Food and Agriculture Organization
PPB	Gender-responsive participatory plant breeding
ISF	International Seed Federation
ISTA	International Seed Testing Association
KALRO	Kenya Agricultural and Livestock Research Organization
KEPHIS	Kenya Plant Health Inspectorate Service
LMIC	Low-and-middle-income country
MTEF	Medium-Term Expenditure Framework
NGO	Non-governmental organisation
NPCK	National Potato Council of Kenya
NSP	National Seed Policy
OECD	Organization for Economic Cooperation and Development
QDS	Quality Declared Seed
RTB	CGIAR Research Program on Roots, tubers and bananas
SAP	Structural adjustment programme
SRA	Strategy for Revitalizing Agriculture
STAK	Seed Traders Association of Kenya
VPC	Vegetatively propagated crops

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Abstract

In many developing countries where farmers grow vegetatively propagated crops (VPCs), they are often unable to increase on-farm productivity partly due to limited access to quality seeds. Yet, seed policy and legal frameworks for VPCs in many countries show a limited consideration of the specific characteristics of the seed systems for root, tuber and banana crops. Moreover, there is a lack of understanding of how the implementation of current seed policy frameworks affect participation by men and women as either seed producers or seed users. This paper examines the Kenyan seed policy processes and discusses the gender-sensitivity of how seed policy decisions are made in order to understand how these can be made gender sensitive. It unpacks the context in which seed policies are implemented; how the content of seed policies can differently affect men and women farmers' participation in seed production and access to seed; and provides recommendations on how seed policy can be made more inclusive.

Analysis of the data gathered for this paper revealed that Kenya's far-reaching legislative reforms approved in 2016, which aimed to modernize seed systems and markets, have triggered key debates on whether such reforms are gender- and crop-inclusive. Scrutiny of existing seed policies, regulations and legislation, and devolved government institutions and structures, show that the new reforms significantly commit government and the private sector to new investments in seed production and marketing. However, inadequate provisions on gender and crop inclusivity are found in the seed policy and there is no specific implementation strategy at the county and national government levels. The explicitly gender-oriented Agricultural Sector Gender Policy (2013) does not say anything about the production of sweetpotatoes or potatoes and their seed, although it does tackle women's access to land, which is a key factor if women are to be engaged in seed production. This paper argues that seed policy needs to shift its focus from punitive measures to enforce the use of certified seed to a more collaborative approach with farmers – including women and youth – to improve the quality of seed available in the informal seed system and guide informal seed producers through the certification process. This will ensure that women and youth understand the benefits of using quality seed and are capacitated to produce and market healthy, quality seed themselves.

Integrating gender into Kenya's evolving seed policies and regulations for roots and tubers

1 INTRODUCTION

In 2016, Kenya introduced far-reaching legislation designed to modernize seed systems and markets for an entire range of crops cultivated in the country. The government revised rules, guidelines, and organizational roles and responsibilities to remain consistent with the legislation. However, the process of revisions to seed policies and regulations usually exclude women, youth and other vulnerable rural farmers who are important actors as seed producers and users. Further, the new legislation bases its requirements for seed drawing on the characteristics and requirements for the seed of grain crops such as maize, but greater crop specificity is needed in the legislation. For example, potato and sweetpotato have completely different seed production and exchange systems to maize, so the policy hinders production and trade in this sector, and also ignores that gender dynamics may be different.

Developing-country farmers growing vegetatively propagated crops (VPCs) are often unable to increase on-farm productivity partly due to insufficient access to quality planting material. This challenge is distinct from that facing cereal crops and is associated with both the unique biological and economic nature of vegetative propagation. VPCs are plagued by problems such as low multiplication ratios, bulkiness, short-shelf lives and difficult maintenance during dry seasons (Moyo et al., 2004). As a result, many commercial seed companies in Africa are often not willing to invest in VPC seed except in the case of ware potato because of its higher value. Despite these challenges, more developing countries are introducing formal market regulations for VPCs, albeit designed with cereal seed experiences in mind. This approach tends to limit their ability to address VPCs as a unique seed category. More importantly, these countries are limiting their ability to address gender and social inclusion issues, especially the participation of young men and women, which, for many VPCs, are key to both production and exchange. The study explores opportunities whereby gender considerations can be integrated into evidence-based seed policy discussions.

However, "seed systems are not simply the link between breeders and farmers to multiply and deliver seed. Instead, they are complex biophysical and socioeconomic systems which encompass and link formal and informal seed sectors" (McEwan et al., 2021a, p. 6). In many VPC production systems, women play several key roles, including selecting, acquiring, multiplying, selling, and purchasing seed. Prior studies suggest that women in such roles are often challenged by issues such as high seed costs, lack of access to quality seed, lack of seed knowledge, and unavailability of seed at local markets (Mudege et al., 2015). Unfortunately, most policies, investments, and programs on VPC seed systems focus on farm households and seed retailers with little reference to gender-based seed challenges. This results in inefficient implementation of seed policies and

regulations for VPCs and continued use and circulation of poor-quality seed, contributing to inadequate cultivation of potato and sweetpotato and consequent low yields. There is considerable scope for strengthening gender awareness and gender-relevant investment by integrating a range of stakeholders into discussions on VPC seed systems, including government regulatory agencies, research organizations, and extension services; private seed producers; importers; and distributors; non-governmental organisations (NGOs); multilateral, bilateral, and philanthropic donors; and many entities.

Work to understand the implications of seed policy frameworks for roots, tubers and bananas is still in its infancy because in many countries regulation may not exist (see Nshimiyimana et al., 2016) or because seed for many root, tuber and banana crops is predominantly in the informal sector (Kromann et al., 2016), which is harder to regulate. However, many countries are moving rapidly towards policies and regulations that align with international treaties to extend formal oversight over all aspects of the VPC seed system – often without a full understanding the negative and unintended consequences for women and youth (McEwan et al., 2021b; Spielman et al., 2021). For example, on average, female-headed households are poorer than those headed by males and are therefore likely to be less seed-secure in terms of their ability to access seed from external sources (see FAO n.d). Furthermore, in areas affected by male labour migration, women are a “key source of knowledge on seed, yet women’s local knowledge – as well as their access to new information – has often been marginalized by formal sector interventions” (Waterhouse et al., 2004).

The main objective of the paper is thus to examine Kenya’s seed policy process and discuss the gender-sensitivity of how VPC seed policy decisions are made. The paper unpacks a) the context in which seed policies are implemented; (b) how the content of seed policies can differently affect men and women farmers’ participation and access to seed; (c) and provide recommendations on how seed policy can be made more inclusive. The paper responds to two questions that are often asked but left unanswered by policy analysts, researchers, and practitioners alike. First, what barriers are being created for men, women, and youth to participate in VPC seed systems as producers and entrepreneurs in relation to both ware and seed production, especially as those systems move towards greater formal regulation? Second, what are the policy options to increase the participation of men, women, and youth in VPC seed systems?

Based on policy analysis, and qualitative data collected through interviews, focus groups discussions and attendance in policy related meetings, this paper argues that there is considerable scope to develop gender-responsive VPC seed policies, as well as policies that consider the role of youth in the VPC seed sector. But to make progress on this front, gender considerations need to be integrated beyond the level of local seed production projects and into the larger, evidence-based discourse on seed system reforms. To that end, this research provides novel insights and recommendations on ways that gender can be integrated into policy processes to increase the likelihood that men, women, and youth are able to benefit.

1.1 THE POLITICS OF SEED SYSTEMS IN THE CASE OF VPCS

The FAO has deemed food security as essential to achieving food security and building farmer resilience (Madin, 2020). To improve food security by increasing crop productivity, the seed system needs to boost access to quality

seed, and thus seed security becomes important, i.e. what seed is available, what is its quality, and who has access to it (Scoones and Thompson, 2011). A seed system includes “the sum of physical, organisational and institutional components, their actions and interactions that determine seed supply and use, in quantitative and qualitative terms, and include formal, informal and seed aid elements” (Scoones and Thompson, 2011, p. 8).

Kenya’s seed system is quite well developed (Kuhlmann and Zhou, 2015). For the crops typically farmed in Kenya, seed systems include both informal and formal trade (Croft et al., 2018). While the “formal seed system is thoroughly regulated and focuses on breeding, producing, and selling certified seeds by registered seed companies”, much of the agricultural land is farmed using informal sector seed (Kuhlmann and Zhou, 2015, p. 5). The Kenya Plant Health Inspectorate Service (KEPHIS) is responsible for monitoring the quality of seed and overseeing seed imports, and certifying seed producers and their plots is centralised. The bulk of certified seed in the formal sector is for cereals such as maize, and legumes such as beans.

Informal trade in seed, while relatively affordable and widely available, can lead to low quality seed being circulated, leading to low producer yields. For the seed of VPCs, there is an increased accumulation of diseases over generations due to the nature of clonal reproduction (McEwan et al., 2021b). However, informal seed systems, in the right circumstances *can* be viable – in terms of producing quality seed and generating income for VPC seed producers if they are provided resources to address key weaknesses and also bring the additional benefit of being resilient to local stressors such as disease and climate; indeed, informal seed systems may be highly genetically diverse and include local seed innovations (Croft et al., 2018). From the 1960s until the 1990s the government of Kenya invested heavily in developing, promoting, and providing high yield, reliable varieties (Croft et al., 2018). With the introduction of structural adjustment programmes (SAPs) in the 1980s and 1990s public investment dropped and private companies moved into the gap. What public funding there is has been directed toward increasing yield of potatoes, tackling disease and dealing with environmental stressors such as drought (McEwan et al., 2021b). Other traits have received less attention, even though other varietal traits are increasingly sought after, such as taste, “earliness, dormancy (allowing for direct planting in the subsequent season) degeneration levels and ease of cooking have had less attention” (p. 6).

Private companies have not filled the VPC seed gap, due to individual farmers only needing small amounts of seed, difficulties in reaching growers, and varying demand from year-to-year. Even though more farmers might be able to produce seed for the market, very few enter the market because it is difficult to produce and distribute high quality seed, which requires an “adequate investment in labour, machinery, pesticides, processing and storage facilities, packaging and marketing” (Zossou et al., 2021, p. 41). Therefore, formal seed systems often

grant temporary monopoly privileges to plant breeders and patent-holders through the tools of intellectual property, as a means to encourage research and innovation in plant breeding. In this process however, the poorest farmers may become increasingly dependent on expensive inputs, creating the risk of indebtedness in the face of unstable incomes.

(De Schutter, 2009, p. 2)

Some NGOs programmes have further tried to fill the gap between formal and informal systems, but this can further hinder development of indigenous seed breeding, because they undercut prices (Croft et al., 2018). Hence, although farmers have boosted production of maize crops, “production of other food crops, particularly legumes and root crops, declined”, due to, among other factors, poor quality planting material, pests and disease, and heavy rains (Government of Kenya, 2010).

Smallholders’ decisions about whether to buy seed from formal or informal markets, use their own seed for several years, or share with others in their locality are based on a complex set of political arrangements, positions of power in the seed system, as well as environmental factors influencing the choice of seed types. Women’s choice of whether to rely on own and/or neighbours’ seed or whether to buy commercial seed is also related to which type of seed is likely to produce the more profit for the farmer; for example, if relatively cheap seed is used, resulting in low yields, the value of net returns might still be more than if a farmer purchased expensive seed and experienced higher yield (McEwan et al., 2021a). A further hindrance to women and/or farmers purchasing certified seed is that they might have concerns “about the authenticity and quality of the hybrid seeds available in local market” (Gharib et al., 2021, p. 2), although the literature on this topic does not cover the prevalence of fraudulent seed provision in the VPC market.

The decision of which type of seed to purchase is also based on the locations of villages, the gender of the household heads and their perception of their own food insecurity, which can lead to intra-household differences, which “mediate access to improved seeds in agrarian settings” (Madin, 2020, p. 14). Many factors influence which seed is adopted, including access to information and knowledge networks, which varies according to gender, ethnicity, religion, education attainment and wealth (Zebroski et al., 2018; Voss et al., 2021). Since women and youth may be the most cash-strapped of farmers, they have limited capacity to afford the market-based seed and inorganic fertiliser on offer (Ouma et al., 2006; Smale, 2011). Further hindrances to accessing market-based seed include low availability of most varieties (including seeds available only being for a few crops) and limited access to agro-dealers, for example, based on the distance to the market and road and market infrastructure (Mabaya and Mburu, 2016; Zebroski et al., 2018). However, research about gender in seed systems should not only look at women and youth as users with access problems or limited access to relevant knowledge, but must examine the gendered nature of seed policies as a whole, and the gendered nature of policy development (Louwaars, 2007).

In the VPC sector, only about 4-5% of seed trade occurs in the formal sector (Spielman et al., 2021). The potato industry consist of a few large-scale ware producers and seed farms, and about 800 000 small scale farmers (McEwan et al., 2021b). Markets are unstructured with minimal value addition key policy discussions on seed uptake tend to focus on persuading farmers to adopt seed sold by the private sector but based in public-private partnerships in research and development (Croft et al., 2018). Such public-private partnerships have proven difficult to coordinate due to the costs of “negotiating intellectual property agreements, asymmetric information on asset positions and bargaining chips, clashes of public and private cultures and a lack of mutual trust” (Scoones and Thompson, 2011, p. 6). The push to develop high yielding varieties and high yielding seed comes from powerful actors in government, the private sector and donor agencies, but the preference for a handful of

certified seed varieties is at odds with the need for genetic diversification to address different climate change impacts affecting local areas; it therefore might be preferable to encourage genetic diversity at local level, while equipping local seed producers with the skills, know-how and support to produce their own seed and have it certified (Brooks, 2014).

The powerful actors in the sector have been able to influence seed policy such that the solution they are equipped to supply becomes the solution promoted to farmers. For example, where government extension services have collapsed, a market solution is argued to fill the gap by training agro-dealers to provide extension services. However, “in dryland environments, the cost of commercial inputs is prohibitive given that a decent harvest, or even a harvest at all, is far from assured” (Brooks, 2014, p. 23). Furthermore, in some parts of Kenya, “farmer adoption of new varieties was associated with seed insecurity” (Mucioki et al., 2018, p. 571). In such contexts, the use of locally adapted varieties, even if they do not provide maximum yields, is often preferred by farmers (Brooks, 2014). Hybridised seed provided by the market may reduce food security in such drought prone environments, while the hardier local seed is likely to at least produce some yield. Increased biodiversity is linked to increased yields, especially when inter-cropping is undertaken, “mixing varieties with contrasting traits, or mixing modern and local varieties provides structural diversity that is vital to on-farm resilience in semi-arid regions” (Mucioki et al., 2018, p. 583).

Nevertheless, government and donor programmes which emphasise private, formal seed systems, tend to influence how farmers obtain seeds and information (Brooks, 2014). Were these powerful stakeholders to shift their focus away from privatised seed, they could make more technical investments in supporting indigenous seed systems, including supporting development of high yield varieties. Indeed, policies that protect high biodiversity by considering native varieties are essential to maintaining seed health (Bentley et al., 2018). With appropriate technical investment the 53% using informal systems may be in a stronger position to provide high quality seed and improve resilience, especially if policies focussed on a wider variety of crops. To achieve these goals, deeper cooperation is needed to close knowledge gaps and support local seed breeders to improve seed quality, taking into account the “complex biophysical and socioeconomic systems which encompass and link formal and informal seed sectors” (McEwan et al., 2021a, p. 6).

The Kenyan government wants to improve production of crops such as potatoes (McEwan et al., 2021b), which is the second staple food crop, so it is important for policy and legislation to reflect the specific requirements of such crops, including ways to ensure quality seed, in terms of disease, pest and physiological parameters, as well as improved yields.

1.2 THE NECESSITY FOR IMPROVED VPC SEED: CHALLENGES IN CROP PRODUCTION

VPCs make a significant contribution to world food production, but have “suffered from low investments, weakly organized value chains, and poorly documented evidence of the value of interventions” (Andrade-Piedra et al., 2016, p. 1). They are produced from vegetative parts of the plant, which are not true seed (Andrade-Piedra et al., 2016; McEwan et al., 2021a). Hence, they are somewhat more susceptible to disease than crops produced

by true seed, significant impact on crop yields. VPCs also tend to be produced locally, because the vegetative seeds are too bulky to transport long distances and highly perishable (Bentley et al., 2018). Further, because “VPCs have low multiplication ratios ... seed production takes longer and is costlier” (p. 600).

Because the quality of seed impacts on crop yields, maintaining crop hygiene for VPCs is of “paramount importance”, and involves regularly checking fields “to uproot and destroy disease-infected plants” (Moyo et al., 2004, p. 51), and also regularly testing soil for possible soil-borne pathogens. In this context, a regulatory framework is needed to ensure seed and soil borne diseases are managed, without impeding the availability and access to seed, especially the seed varieties favoured at local level. Indeed, investment in quality seed to boost production “of root, tuber, and banana crops, predominantly grown by the poor, have high impacts on poverty alleviation”(McEwan et al., 2021a, p. 7). For example, in many African countries, production of cassava, yams, bananas and plantain have a significant impact on reducing poverty (Wiebe et al., 2021).

Due to the complexity and difficulty of producing quality seed for VPCs, “seed multiplication is an expensive exercise” (Moyo et al., 2004, p. 56), and there is a shortage of extension staff with the relevant expertise to monitor seed quality, for example, KEPHIS inspectors may not have the appropriate knowledge to cover several crops since most are only trained on maize and other cereals or legumes. Hence, inspectors may not provide adequate supervision to the formal VPCs seed certification process. Therefore, it is important to consider how best to encourage some participants in the sector to become permanent seed producers (Bentley et al., 2018). Teaching farmers how to select seed can help keep the seed healthy; however, it is also important to draw on local knowledge and integrate new technologies in a way that works with existing seed production systems. This points to the need to consider both the biologically relevant properties of the seed *and* the socioeconomic circumstances in which they are being produced (McEwan et al., 2021a). For example, because women typically have access to smaller plots of land, they may only need small amounts of seed, which in any case they can access through social networks or can multiply on farm (Bentley et al., 2018).

Where breeders are producing improved varieties for VPCs, a marked mismatch may occur between what breeders are producing and the characteristics preferred by farmers – especially as farmers in different locales may prefer different varietal and seed characteristics (McEwan et al., 2021a). It is therefore important for breeders to consider how they can provide for the different characteristics different farmers need, which requires closer collaboration between breeders and different types of end users for the crop. Of particular note for this study, women may want different varieties of seed and also different volumes based on different amounts of land and time they have available for cultivation (Bentley et al., 2018). Therefore, successfully multiplying and distributing quality seed includes understanding the quantity, and seed health quality, as well as varietal factors such as the colour and cooking qualities buyers want. Failing to take the differences into account affects the effectiveness of regulatory systems and access to seeds, which would impact on household incomes and food security.

Further, collaboration is also needed to develop a viable policy framework for VPC seed production, including “integrated seed health models, inclusive seed business strategies, realistic approaches to understand and

respond to farmers' demand based on trait preferences and seed acquisition behaviour, ... adapted to local realities"(McEwan et al., 2021a, p. 9).

1.3 WHY IS IT IMPORTANT TO INCLUDE WOMEN IN SEED POLICY?

Because Kenyan farmers may be men or women, young or old, it is important to ensure policies address the needs of all of them. In seed system, gender gaps occur in seed breeding, production, selection, and distribution stages, as well as in how the seeds are used and who reaps the benefits from this use" (Berber and Alessandra, 2020, p. 1). In this section, we first tackle general differences between men and women in the household which influence the type of seed accessed; thereafter we speak to the gendered differences in how men and women approach seed production.

Gender influences the labour division in the household, such that women and men have different concerns or objectives within the household (Madin, 2020; Zossou et al., 2021). The gender roles and concerns also influence how farm or plot management are undertaken, including that women typically have access to smaller plots, less fertile soil, poorer access to irrigation, and lower access to commercial fertiliser (Ndiritu et al., 2014; Otieno et al., 2021; Ouma et al., 2006). Therefore (i) they are more likely to experience crop failures, directly impacting on household food security (Nyongesa et al., 2017). Depending on the household division of labour women might mainly focus on food crop production (albeit that food crops may also be sold at market), while men might focus on cash crops; the two groups may also be involved in different crop networks with differing market access (Nyongesa et al., 2017; Zebroski et al., 2018). The social roles of men and women and the cultural/ community norms and values also influence "seed selection, adoption, seed production, management" (Marimo et al., 2021, p. 842).

Gender roles are socially and culturally defined in ways that perpetuate inequality (Ndiritu et al., 2014). While there is strong evidence that gender roles are changing with women becoming more empowered, and playing more important economic and development roles in the household than a decade ago, inequality still exists (Bullock and Tegbaru, 2019). For example, "[d]ecisions about which crops to plant and management often center around land, that is typically inherited or purchased by men" (p. 85). While women are now much more engaged in economic opportunities, and for example, involved in NGO programmes that provided education, women remain responsible for the bulk of unpaid housework. Women and men may socialise in different groups, so they might have different access to seed and knowledge (Zebroski et al., 2018). Because married women often live outside the community where they were born or grew up, they may have more distant family ties, and therefore may share seed further afield. This means that even though men have more financial capital, women may have more social capital, which leads them to depend more on informal seed networks (Marimo et al., 2021; Zossou et al., 2021). Although men tend to be embedded in systems where only improved seeds are exchanged, women tend to be "more reliant on farmer-to-farmer networks than men due to their relative isolation from other seed and information sources" (Otieno et al., 2021, p. 2079). Previous research has found that "male farmers are more likely to share seeds and information with male farmers, and female farmers share almost equally with male and female farmers" (Zebroski et al., 2018, p. 6).

Further, “profound socio-cultural inequalities” exist “between males and females in terms of access to information, knowledge, markets and services” (Ndiritu et al., 2014, p. 126). Women and men are likely to have access to different information about specific crops/seed, such as genetic information about improved varieties (Otieno et al., 2021). Women may also lack information about new farming methods, new types of inputs, and new, more advanced equipment, creating “gender-technology gaps” (Ndiritu et al., 2014, p. 126). However, informing women about technological advancements in agriculture, including enhanced seed varieties, has the greatest impact on food security and food crop yields (Dar et al., 2020). Therefore, providing information about seed to women’s social networks is likely to boost their access to information, and their productive capacity (Dar et al., 2020; Zebroski et al., 2018). For example, providing equal access to extension services for men and women is likely to significantly increase uptake of new agricultural technologies (Ndiritu et al., 2014; Nyongesa et al., 2017). It should also be noted that as women gain more power through their economic activity, men may still try to exert their authority by placing restrictions on what types of activities they may be involved in, including attending events where information might be provided (Bullock and Tegbaru, 2019). Nevertheless, “[w]omen gain more access to agricultural knowledge than a decade ago, in what was once a male-dominated domain”, and to maintain the trajectory of women’s empowerment, services that provide women with access to knowledge about seed production are likely to be well-received.

Socioeconomic factors also influence the uptake of agricultural technologies (Ndiritu et al., 2014). Indeed, purchasing certified seed is mainly related to socio-economic position, so the limited uptake of certified seed by women, is related to their lower socio-economic position and access to finances. Unless the costs of seed certification are limited, women who typically have a limited seed budget, will not be able to afford certified seed, and if they are producing seed themselves may not be able to afford having it certified. However, men and women also have different incentives for the type of seed they wish to purchase (Okello et al., 2019). For example, when promoting the use of certified seed promoters tend to mainly focus on informing potential buyers of improved crop yields, which is of interest to men; however, promoters tend not to inform potential buyers about the possibility of some varieties with extended shelf life, which may be of greater concern to women who want to make a crop available to the household for longer. Further, those who use certified seed “tend to be more market focused, while nonusers are household focused” (p. 290). A Nigerian study showed that seed sharing was seen as “a social responsibility with members expected to share banana seed with the needy mainly as gifts rather than sold for cash” (Nkengla-Asi et al., 2021, p. 3362). As such, marketers of certified seed need to provide information that addresses various concerns, i.e. including which varieties have a longer shelf life, as well as the increased quantity, which has been the main selling feature pushed until now (Berber and Alessandra, 2020; Okello et al., 2019).

Given the issues identified throughout section 1, it is important to recognise that with respect to seed users:

High quality seed is essential but needs to include varieties that address the needs and preferences of different demographics of women and men;

Smallholder women and men must have physical access to affordable seed in the right place, at the right time;

Making seed accessible goes beyond ensuring seed is available, that it has good physical qualities, and finance is available, but includes access to reliable information, regardless of the gender of the seed user; and All users – women and men – should benefit from access to and use of quality seeds (Kramer and Galiè, 2020).

Apart from seed use, it is important to highlight women’s role in seed production. Even though women are highly involved in seed saving and breeding, they often do not have access to the resources and institutions necessary to enter the formal sector (Zossou et al., 2021), due to lack of capital, lower income and limited access to sufficient appropriate land for the necessary field rotation for producing healthy seed. Indeed, women “are often overlooked as farmers, innovators, and entrepreneurs” (p. 44). Addressing the limited access of women to formal systems, by involving them in certification of their seeds, which “keep diversity alive” (p. 44) would boost seed production, thus contributing to higher crop yields, with a direct impact on food security. Therefore, it is essential that policies about seed production and dissemination be defined in a gender-responsive way, including boosting women’s access to finance to support innovative seed production and access to sufficient land to undertake the necessary field rotation (which could include ‘pooling’ land in cooperatives or other innovative solutions women might have).

When economic and agricultural programmes focus on women, they help address inequality, bring women into public spaces, and improve innovation (Bullock and Tegbaru, 2019). This means that seed policy makers and those who certify and inspect seed producers and their plots need to interface and consult with informal social networks, taking into account gender specific needs, to bring women into economic and agricultural programmes and facilitate information flows to women (Madin, 2020; Marimo et al., 2021); as will be shown in the case studies, women often only access information second-hand, then either they do not understand it or what is being said to them is a misrepresentation of the information. Policy makers also need to consider how different policies, programs and business models can support women’s seed production, and as well as considering how users will access quality seed such that users are aware of “the benefits arising from their use, in a cost effective, inclusive, and equitable way” (Berber and Alessandra, 2020, p. 1).

2 METHODOLOGY

The methods used to develop this report were firstly, a content analysis of the relevant policies, and secondly, collecting qualitative data in the form of interviews, focus group discussions, and attending and recording relevant meetings. Some of the data was also drawn from a complementary study, entitled *Exploring the regulatory space for improving availability, access and quality of vegetatively propagated crop seed: potato in Kenya* (McEwan et al., 2021b).

2.1 REVIEWING POLICY CONTENT AND PROCESSES

This policy analysis is underpinned by a gender lens which seeks to understand if policies tend to focus on ‘equal’ treatment, whereas they need to focus on equitable treatment, i.e. giving more support to those who need more support; understanding the specific economic, political, and social realities of women and ensuring that policy acknowledges these specifics; the need for material redress in circumstances where women have been materially disadvantaged; and understanding of power relations (McPhail, 2003). Therefore, to ascertain the inclusiveness of men, women and youth in the seed system, the study reviewed, policy and strategy documents, which include:

- i. The National Seed Policy (2010)
- ii. Agricultural Sector Gender Policy (2013)
- iii. National Potato Strategy (2016)
- iv. Strategy for Vitalization of Agriculture (2004)
- v. Agricultural Sector Development Strategy 2010-2020 (2010)

The Kenyan seed policies and strategies are complemented by brief analysis of key legislation and regulations formulated to enforce the implementation of both policies and such legislation:

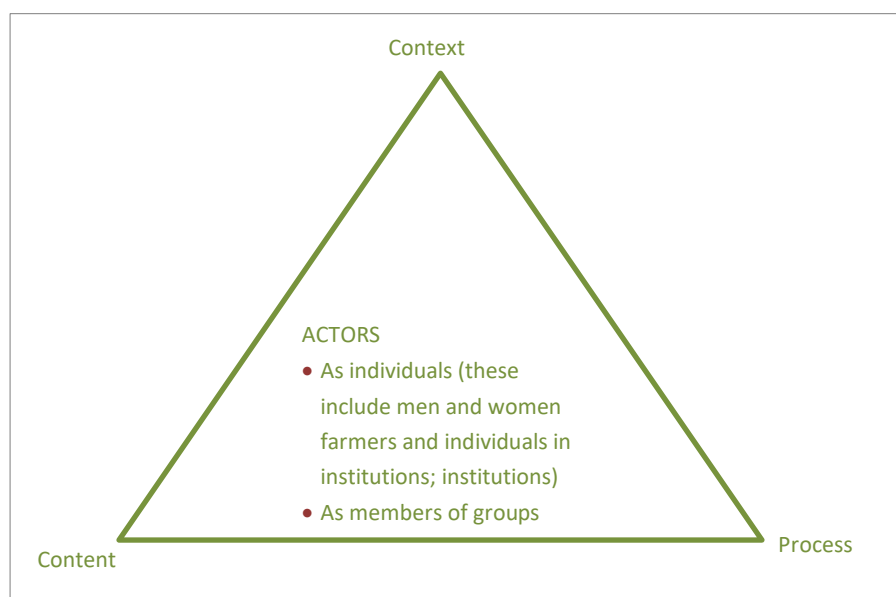
- i. Seed and Plant Varieties Amendment Act (2012)
- ii. 2012 Revision of the Seeds and Plant Varieties (Seeds) Regulations, 1991
- iii. Seeds and Plant Varieties (Variety Evaluation and Release) Regulations, 2016 [L. N. 215/2016.]
- iv. Seeds and Plant Varieties (Seeds) Regulations, 2016 [L. N. 220/2016.]

Our policy analysis assumes that policy making process is “a political rather than a purely technical affair” (Béland, 2009, p. 565). As such, policy analysis is not only about the content of the policy, but also about the context in which the policy is made, the processes which shaped it, and the power dynamics between the different actors. Therefore, we adopted the Walt and Gilson (1994) policy triangle framework (see **Error! Reference source not found.**), which is widely used in policy analysis in low-and-middle-income countries (LMICs) and allows for the examination of different kinds of policies in a wide variety of contexts (Gilson and Raphaely, 2008).

We used the framework to analyse the contextual factors that influenced the policy change by identifying stakeholders, their influences, powers, and position that may have facilitated the policy to move forward. In the

policy space, stakeholders may include individual persons and groups, particularly those interested in the policy issue at stake, or those whom the policy might affect in one way or the other, and those who are likely to play role in implementing such a policy (Buse et al., 2009).

Policy making and implementation is a dynamic process (Scoones et al., 2007), so the policy does not rest once the relevant documents have passed into legislation; instead, the staff implementing the policy can change it significantly, either enhancing or undermining the original intent (Walt et al., 2008) and depending on how well the policy explains how it should be implemented. Further, in considering the seed policy and systems relevant to this study, we sought to establish who benefits from a particular policy, whose interests are being served, and who loses out (Scoones and Thompson, 2011).



(Walt and Gilson, 1994)

Figure 1: Policy triangle framework

2.2 QUALITATIVE DATA COLLECTION

Qualitative data collection methods include focus group discussions and individual interviews carried out in 2018. Focus group discussions were held in Homa Bay (16 with women; 15 with men) and Nyandarua (3 with women; 2 with men; 2 mixed groups of young men and women). Individual interviews were also conducted with men and women including young men and women (some of whom were seed producers), staff from Nyandarua and Homa Bay County, and extension officers.

The data was supplemented by previous data from a 2017 study on the regulatory space for VPCs, which culminated in a meeting held in Nairobi from 11-12 February 2019, entitled *Opportunities for shaping the future of seed systems for vegetatively propagated crops: Policy, regulation and gender considerations*. Participants included representatives of government ministries, county governments, regulatory agencies, private sector, nongovernmental organisations, and national and international research organizations, all of whom contribute to key elements of VPC seed systems. Specific emphasis was placed on the potato and sweetpotato seed systems in Kenya and the policy and regulatory change process around them. The workshop aimed to:

- i. share evidence and insights on the policy and regulatory dimensions of VPC seed systems in Kenya and, more generally, eastern and southern Africa;
- ii. reflect on current approaches to VPC seed policy and regulation, with an emphasis on seed markets, smallholder inclusion and sensitivity to gender and youth;
- iii. provide a regional cross-country learning opportunity on VPC seed policy, regulation and approaches for Kenya, Malawi, Mozambique and Tanzania.

3 FINDINGS

3.1 CONTENT OF POLICIES, LEGISLATION AND REGULATIONS

Seed policy in Kenya (and elsewhere in Africa) conflates a ‘technical fix’ for low seed quality with a market-based use of agricultural technologies (including seed) and “site-specific and locally derived and adapted technologies and institutions”, sometimes leading to an inappropriate push for market-based seeds rather than supporting innovative local initiatives (Brooks, 2014, p. 5). Further, the seed policies and regulations include many clauses, which create barriers for seed producers to overcome should they want to be registered and have their plots registered. The effect has been to increase focus on single cash crops, hybrid seeds and inorganic fertilisers, while limiting the varieties of certified seeds available and the number of ‘legal’ seed dealers, eroding “biological and institutional diversity” (p. 24). In the implementation of its seed policy then, the Kenyan government mainly supports public-private partnerships in ware potato and seed potato to boost the private sector by training agro-seed-dealers in different parts of the country, albeit that agro-dealers are unevenly spread in the country and tend to focus on areas where high yields are already being achieved (Scoones and Thompson, 2011). Further, the recipients of training are mainly determined by political connections and power dynamics in the area where trade is occurring. Therefore, it is essential that policy options do not only focus on scientific, technical solutions and market ‘fixes’, but also examine the “political, institutional and social dimensions” of seed provision (p. 3). Key to this paper, is that gender is not addressed in most of the policies, and this means that gender-power relations/gender politics with respect to seed and ware production have not been addressed.

Seed regulatory frameworks in Kenya, including for example, seed potato certification procedures have not led to increased availability of quality seed, and probably will not impact on the spread of disease in the sector (McEwan et al., 2021a). Importantly, however, hardly any informal VPC seed producers and their plots have been certified (e.g. only 2% of potato seed [is] currently certified), and different policy actors, with conflicting interests, do not agree on how to increase the availability of high quality seed (McEwan et al., 2021b).

In Kenya, since the 2000s, two policies have led to the focus on commercialising agriculture and food production: *Kenya’s Strategy to Revitalize Agriculture* (2004) and the *Agricultural Sector Development Strategy* (2010), while the regulations on seed are governed by the *Seed and Plant Varieties Act* (2012). Also relevant, to this study the *Agricultural Sector Gender Policy* (2013).

Further, international seed trade is guided by international organisations, including the Organization for Economic Cooperation and Development (OECD), the International Seed Testing Association (ISTA), which set the “rules and procedures for seed quality testing” (Kenya Ministry of Agriculture, 2010, p. 3). However, striking in a different direction, and the FAO’s *International treaty on plant genetic resources for food and agriculture*, protects farmers’ rights to be involved in decision-making about seed, and “save, use, exchange and sell farm-saved seed and other propagating material” about seed (FAO, 2009, p. v). The FAO is concerned that seeds covered by intellectual property may hinder seed being provided at reasonable prices.

Despite the FAO concerns, according to the *Agricultural Sector Development Strategy* (Government of Kenya, 2010, p. 5), the Kenyan government has argued that:

While more support and investment are required from the public sector for it to grow, much of the work—production, processing, marketing, value addition and financing—is done by the private sector. Subsectors where the Government has little involvement, such as horticulture, are resilient to external shocks and are growing rapidly. Likewise, subsectors that are liberalised perform better generally than those that are not.

The content of each policy is briefly described below.

3.1.1 THE FOCUS OF THE NATIONAL SEED POLICY (2010)

The Ministry of Agriculture states that “The National Seed Policy is the Ministry's outline of policy interventions to be pursued in order to address current constraints in the seed sub sector and to improve its performance and contribution towards improved agricultural productivity.” Yet, while the National Seed Policy (NSP) of 2010 aims “at giving clear direction of the seed sub sector development in order to sustainably avail adequate high-quality seed and planting material to the users and harmonizing all seed related activities” (section 2.2.2), the policy is silent about participation of women and youth in the seed system. Even though one of the policy objectives is to create an enabling environment through legal and policy reform for effective participation of both public and private sector in the production and promote sustainable access to affordable credit, the objectives do not specify how the policy might be gender inclusive.

During policy discussions, private seed companies, especially multinationals, represented by the Seed Trade Association of Kenya (STAK) dominated such that the policy is more concerned with formal sector (Munyi and De Jonge, 2015). While the policy recognises the informal sector, which is dominated by women, to ensure the quality of seed the NSP put more emphasis on the certification of seeds. The seed sources in the formal sector are well known compared to the informal sector, whereas the seed quality of the informal sector is unknown due to a lack of inspection and certification.

The NSP (2010, p. 23) states:

The source and quality of most of the planting materials and seed purchased multiplied and marked by the informal seed sector may not be known, yet this is the major source of planting material for farmers.

As such, for the informal seed sector to determine the quality of their seed, they are advised to make use of KEPHIS which deals with seed inspection, testing and certification. However, the policy makes no mention of women; given women’s lack of information – identified in the literature and the case studies below – women are unaware of how to use KEPHIS and it would be important for the NPC to undertake specific communication directed at women, if they want women to participate in ensuring quality seed production.

According to the NSP, potato seed is among the top three seeds generating significant income to leading seed producing countries/companies in the world. However, even though Kenya is one of the top seed producing countries in Africa, it lags behind in the global context. Section 2.1.5 of the policy highlights the “inaccessibility

to affordable credit” as the key challenge to seed growers, seed dealers and seed consumers has constrained seed production, distribution and utilisation. In many ways this thus affects the “adoption rates for seed and complementary technologies.” (p. 16). Section 2.1.11 further highlights that Kenya does not have strategic seed reserves which puts the country in jeopardy when any disasters such a prolong droughts and floods which may destroy seeds and with poor largely affected. The policy acknowledges that KARI has developed varieties of various food crops such as cereals pulses and legumes, root and tuber crops, but there is no direct mention of the potato.

3.1.2 THE AGRICULTURAL SECTOR GENDER POLICY (2013)

The Agricultural Sector Gender Policy (2013) was developed based on Vision 2030 (2007) with the goal of increasing the participation of men and women in all spheres in the agricultural sector. The policy aims to address gender inequality in the sector and improve gender mainstreaming to enable the country to realize economic grow and gender-based commitments made in the country’s constitution. The policy is based on regional and international human rights, Kenya’s constitution, legislation, and relevant policies and recognizes the contribution of women in agricultural production. Taking on board the World Bank’s 2012 Gender Equality and Development Report, the policy recognises that women-headed households are poorer compared those headed by men. For example, only 66% of women engage in off-farm activities, while 79% of men do so, and earn twice as much as women from these activities (Government of Kenya, 2013, p.8). The policy takes on the persistent gender inequalities in the agricultural sector which manifest in women’s negligible share of productive resources ownership, heavier workload and low representation in agricultural sector institutions, limited access to agricultural product markets and other related services. It highlights that inequality across “gender, age and socio-economic axes” in agriculture are mainly caused and “perpetuated by patriarchal culture and systems” (p. 8).

Citing regional and international treaties and policies on gender inequality, the policy includes wording from the Article 19 of the Protocol to the African Charter on Human and People’s Rights on the Rights of Women in Africa (2003), which emphasises that member states should:

(1) Promote women's access to and control over productive resources, such as land, and guarantee their right to property (2) Promote women's access to credit, training, skills development and extension services at rural and urban levels in order to provide women with a higher quality of life and reduce the level of poverty among women.

(Government of Kenya, 2013, p. 12)

Even though the policy is focussed on gender it still does not include specifics about women’s crops and types of work. For example, it does not mention women’s role in VPCs, and instead dwells on men’s crops being “cash crops such as coffee, tea and sugarcane” and women mainly being smallholders who grow food crops (Government of Kenya, 2010, p. 15), even though in practice, food crops often bring in more money. However, the policy does include the need to reform the agricultural sector to improve women’s access to factors of production. Section 2.2.1 states that it will:

Implement interventions to transform gender power relations at the household level in order to: achieve gender equity in access to and control over factors of production; balance the participation of women and men in decision making; re-distribute and share workload; and promote farming as a cooperative family activity blending the roles of females and males into a more equitable and productive model.

(Government of Kenya, 2013, p. 17)

The policy also highlights the “severe legal, regulatory and administrative barriers” women face when wanting to start and run an agri-businesses – more so than men. Due to the barriers, women’s businesses tend to be smaller, “are less likely to grow and have less capital investment” (p. 19). To address these barriers, the policy commits to adopting a community-driven development approach, so that women can better access business development services. Given the prominence of informal seed production for VPCs such as potatoes and bananas these commitments should also be included in the seed policy to ensure they also apply to women who want to engage in seed production. Furthermore, the policy acknowledges that women face a huge hindrance to food and seed production because they do not have access to land; to address VPC seed and ware production it is essential that work to increase women’s access to land be implemented, so that women have enough land to ensure the proper field rotation for the production of healthy seed and ware.

The policy is meant to be implemented by key stakeholders in the agricultural sector, including public, private and civil society actors (including farmers, pastoralists, and fisher folk, households, agribusiness and processors), who form centralised and decentralised implementation coordination units. Further, a Gender Advisor for the sector was foreseen, to ensure gender is fully mainstreamed in the agriculture sector.

Although the policy sets clear outcomes and indicators, it remains to be seen what impact these reforms will have on the seed sector. As such, interested stakeholders working through platforms such as National Potato Council of Kenya (NCPK) need to monitor the extent to which outcomes are met on the ground and ensure that the seed policy includes the kinds of gender sensitivity provided for in the Agricultural Sector Gender Policy (2013). One possibility is that such stakeholder working with the NPCK) gather gender and age disaggregated data in the seed sector, so as to provoke debate and secure the attention of the political actors and policy makers at the county and national levels. Since women’s access to land is at the nub of why they are unable to produce certifiable seed, land access needs to be included in seed policies, especially for VPCs – matching the Gender Policy.

3.1.3 NATIONAL POTATO STRATEGY (2016)

The National Potato Strategy (2016) aims to deal with the fact that public institutions in the potato sector do not have enough human, financial and physical capacity to address the service needs of the sector. According to the policy: “Seed producers and multipliers use inefficient business models to produce seed. Traders and processors operate independently. The industry’s linkage platform NPCK is still weak” (p. 24). Therefore, the policy outlines seven strategic objectives, which include (i) strengthening institutional, legal and regulatory frameworks; (ii) promoting seed production and variety development; (iii) enhancing research capacity;

(iv) boosting potato production; (v) improving post-harvest handling, value addition and marketing; (vi) promoting public-private partnerships in the sector; and (vii) improved funding for the sector.

The policy does not specifically mention women or gender but argues that smallholders in the sector lack access to adequate services (financial services, extension services and structured marketing systems), and because smallholders cannot always meet market demands, they suffer from price fluctuations and are often exploited when there is a glut. Therefore, the policy argues, county governments, development partners and the private sector should work together to *inter alia* (i) boost extension services and other skills (for example, through business incubation hubs); (ii) develop contract farming models whereby small-scale producers can supply to food processors; (iii) promote the creation of ware potato business organisations; (iv) develop research not just for plant health, but also for market and product research; (v) provide information about relevant farming technologies and markets; (vi) create marketing groups and infrastructure (including ICT systems); (vii) finalise guidelines for building storage facilities. Although these were not particularly shaped to be gender inclusive, some of these ideas can be deployed to support women and youth in the sector. Further, the potato strategy should consider innovative ways to increase women's access to land.

3.1.4 THE STRATEGY FOR VITALIZATION OF AGRICULTURE AND THE AGRICULTURAL SECTOR DEVELOPMENT STRATEGY

The *Agricultural Sector Development Strategy* (ASDS) is the continuation of what was achieved in the previous *Strategy for Revitalizing Agriculture* (SRA) developed in 2004 aimed at revising declining trends in agricultural performance by introducing a new approach in the management of agricultural sector. Therefore, the development of ASDS was based on the achievement and lessons learned from SRA as a guidance.

The ASDS was developed with the aim of providing guidance for public and private sectors' effort in overcoming the key challenges facing the Kenya's agricultural sector. Besides ensuring food and nutritional security for all Kenyans, the strategy aims at generating higher incomes as well as employment, especially in the rural areas. The idea behind the development of ASDS was "to position the agricultural sector as the key driver for delivering the 10 per cent annual economic growth rate envisaged under the economic pillar of Vision 2030" (Government of Kenya, 2010, p. 7). The Vision 2030 (2007) is described as a long-term development blueprint which aims to transform Kenya's economy under three pillars of economic, social and political. The vision identified four challenges facing the agricultural sector which are productivity, land use, markets and value addition. Whilst the strategy is seen as a milestone in the development of agricultural sector, it is silent on the seed system and participation of women and youth in the sector and does not tackle the specific challenges women ware and seed producers may face. Therefore, it has not addressed how men and women may differently contribute to revitalization of the sector, especially the factors that may hinder women from generating higher incomes and employment.

3.1.5 SEED AND PLANT VARIETIES ACT (2012)

The main purpose of the Seed and Plant Varieties Act (2012) is to ensure that diseased seed is not sold to prevent the spread of disease, ensure that seed producers are registered, and ensure that seed

buyers have access to adequate information to make seed purchase decision (including the information supplied on plant packaging). The Act describes its ambit in eight points:

- i. for ensuring that reliable and adequate information is afforded as to the nature, condition and quality of seeds intended for sale;
- ii. for preventing the sale of seeds which are deleterious, or which have not been produced in specified conditions, or which have not been tested for purity or germination, or which are of a plant variety of which the performance has not been subjected to trials;
- iii. for requiring the registration of persons growing any specified crop for the main purpose of seed production, or of persons selling any seed;
- iv. for preventing the spread of plant disease by the sale of seeds;
- v. for requiring the treatment of seed, by any specified means, for the control of plant disease and regulating the importation, quality, testing and sale of any material used in such treatment;
- vi. for regulating the descriptions under which seed is sold;
- vii. for regulating, controlling or prohibiting the export of seeds;
- viii. for prescribing anything which, under this Part, is to be prescribed or which, under any other provision of this Act, is to be prescribed by seeds regulations.

The Act further outlines the process for registering the variety name for any plant and including them on the index of names of plant varieties, including testing procedures, the need to keep proper records (including about sales, inventory, and previous certifications). Regarding testing stations for checking seed quality and certifying seed, only the minister may determine where such stations will be situated and how many seed testing stations will be allowed. Only these testing stations are allowed to certify seed. This means that farmers or seed producers in the informal sector may not test their own seed, even if they have the skills to do; it also means that businesses are not allowed to conduct their own tests but must rely on government testing stations to do the testing. Seed testing officers are allowed to confiscate sample of any seed at any time to subject it to testing if seed is being sold to farmers.

Seed producers are only allowed to undertake seed production if they can prove that they have sufficient finances to ensure that seed is produced in “a competent and businesslike manner” (Section 23 (8)). Plant breeders must also periodically pay fees to the ministry in connection with testing of their product and providing certification. Seed producers must keep records regarding the finances and certification and keep registers of their seed production efforts. Seed producers further have the responsibility to generate enough seed to supply farmers “at reasonable prices” and “on reasonable terms and conditions” (Section 23 (1)). However, the Act does not specify any criteria for determining whether the price, terms and conditions are “reasonable”. As such, the purpose of the Act is to limit the number of seed producers and confine seed production to those who want to produce seed for commercial gain. Those producing seed in the informal sector to support community seed sharing may

not be allowed to go forward because they may not be in good financial standing in terms of the Act (although the Act does not define what level of finance would be satisfactory); they may also not be in a financial position to periodically pay fees to the ministry.

Further, the Act limits the number of varieties of a particular crop that can be distributed: for each crop type and list of prescribed varieties will be produced, and seed producers are not allowed to distribute seeds for other varieties. Seed breeders may develop new varieties and request that these additional varieties be added to the prescribed list so long as the new variety is superior to existing varieties on the list and is distinguishable from other varieties. However, until the performance of the new variety has been measured to the satisfaction of national variety release committee members and the variety officially released, seed of that variety may not be sold or distributed. These regulations apply to imported varieties and seed: no seed may be imported without being subjected to the same rigorous examination as local seed producers' face; and a variety will only be registered if it proves suitable for Kenya's agricultural conditions and needs. Therefore, seed varieties being produced in the informal sector, which farmers may prefer based on varietal qualities (e.g. taste, long shelf life, time spent from planting to harvest) may not be produced, even if a particular community has favoured the variety for a long time.

Any transgression of the above regulations is regarded as a criminal offence, and seed samples can be used in a court of law to prove that an uncertified seed was distributed. Seed producers may be charged with "civil liabilities" if their seed causes harm to the purchaser's crop and soil and leads to the spread of diseases. Seed producers may then especially be held liable for providing seed information to seed purchasers, such as false declarations about the seed quality and level of testing done on the seed. To adjudicate in the instances where seed producers are accused of transgressing the Act, the Act further establishes a "Seeds and Plants Tribunal" (Section 28). Further, if seed producers are aggrieved by the certification process and feel their seed should have been certified but it was not, the seed producers may take their case to the tribunal and request relief.

3.1.6 OTHER REGULATIONS

The regulations on seed and plant varieties have been amended in recent years. These are shown in *Table 1*.

Table 1: Seed and plant variety regulatory framework relevant for VPC seed

Regulation	Purpose and implications for women and youth engagement
Review of Subsidiary Legislation of the Seeds and Plant Varieties Act (Cap 326)	<ul style="list-style-type: none"> ◦ Provides room for including women and youth through its provision for stakeholder representation; ◦ Provides for revision of crops under compulsory certification (Second Schedule), seed classes and standards to comply with international requirements such as sweetpotato.
2012 Revision of the Seeds and Plant Varieties (Seeds) Regulations, 1991	Still vague on women's inclusion but does provide requirement for seed certification standards for potato.
Seeds and Plant Varieties (Variety Evaluation and Release) Regulations, 2016 [L. N. 215/2016.]	Weak on women and youth engagement on seed protection and instead reduced the number of certified seed classes from C1-C4 (2012) to C1-2 (2016).
Seeds and Plant Varieties (Seeds) Regulations, 2016 [L. N. 220/2016.]	Provide provisions for women and youth engagement in VPC seed production through release of landraces, farmer-bred or selected varieties allowed such as Shanghi which is largely used by women.

Adapted from: McEwan et al (2021b, p. 11).

3.2 ACTORS: STAKEHOLDER ANALYSIS

The formal seed sector includes many actors (see *Table 2*). Many of these actors are included in policies related to the seed sector, with clearly defined roles and responsibilities. However, the informal sector is not generally included in policy, and thus their roles and responsibilities are not defined.

Table 2: Key actors and their roles in Kenya's formal seed sector

Actors	Roles
Seed users	Sourcing seed
Seed producers (a large sector with can include KALRO, seed companies, individual and groups of small-scale seed producers)	<ul style="list-style-type: none"> ◦ Research and breeding ◦ Breeder and foundation seed production ◦ Quality control ◦ Redistribution and sales
KEPHIS	<ul style="list-style-type: none"> ◦ Variety testing and release (NPT, DUS) ◦ Plant Variety protection (PBR) ◦ Seed Certification ◦ Phytosanitary and quarantine services
Seed Traders Association (STAK)	<ul style="list-style-type: none"> ◦ Represent interests of seed industry ◦ Align Kenya seed policies with global seed practices ◦ Advocate for private seed inspection system and self-regulation
Ministry of Agriculture, Livestock and Fisheries	Coordinate formulation and implementation of policies and strategies for sub-sector

County Department of Agriculture	<ul style="list-style-type: none"> ◦ Providing extension services ◦ Policy implementation ◦ Training staff and farmers on technology transfer
NGOs, Foundations	Education, training & extension
KALRO Tigoni – national potato programme and Agricultural Development Corporation (ADC)	<ul style="list-style-type: none"> ◦ Breeding, selection and evaluating potential new varieties ◦ Early generation seed production and provision ◦ Developing and disseminating suitable technologies ◦ Research on pest and disease management ◦ Maintaining and supplying breeder’s seed ◦ Disseminate research findings to the MoALF and other stakeholders ◦ Capacity building on seed production and marketing
FAO	Support for normative policies for seed trade and plant health
Stakeholder forum (NPCK)	<ul style="list-style-type: none"> ◦ Represents potato ware and seed value chain stakeholders ◦ Advocates for place of small-scale seed producers
Policy stakeholders	Balancing needs of smallholder and commercial farming interests
CGIAR	<ul style="list-style-type: none"> ◦ Support breeding/selection ◦ Validate seed production models with private sector and NGOs ◦ Pest and disease diagnostics and management strategies
Extension agents	Education, training and extension
Universities	<ul style="list-style-type: none"> ◦ Research & breeding ◦ Breeder and foundation seed production ◦ Education, training & extension

Sources: *The African Seed Access Index, 2016:1; Mabaya and Mburu, 2016; McEwan et al., 2021b).*

Understanding the dynamics of policy making process and its implementation requires thorough understanding of its key drivers, interests and influence. The paper assessed the key actors who drove its formulation process, and those who are implementing today identifying their interests, strengths and weakness whenever possible. The analysis also examined how power is exercised and how stakeholders influence the policy process. Power is defined as the ability to achieve the desired outcome to do something (Buse et al., 2009). Thus, what stakeholders do is mostly shaped by their power relative to other factors. In this analysis, there are some stakeholders who have formal and informal power while others have formal power. For instance, the cabinet which includes Presidents, and the Minister of Agriculture and other members of the government departments and institutions have formal power to make decisions regarding the policies in their country.

The analysis of the three policy documents and two strategies shows that apart from the cabinet, a range of other stakeholders participated in the processes of formulating these documents, as depicted in *Table 3*. However, breeders, farmers, civil societies, women groups, youth groups, researchers and the community in general did not participate in the policy processes. To understand the relationship between the different actors, we sought to understand how women and youth farmers see the policy, and how power is distributed between them and other actors.

Table 3: Key actors involved in the policy development

Policy Document	Stakeholders
National Seed Policy (2010)	Ministry of Agriculture, Kenya Agriculture Research Institute, Kenya Plant Health Inspectorate Service, Seed Traders Association Kenya, Kenya Institute of Public Policy Research, Kenya National Federation of Agricultural Producers, Kenya Forestry Research Institute, Consumer Information Network.
The Agricultural Sector Gender Policy (2013)	Ministerial Task Force, The Agricultural Sector Coordination Unit (ASCU), Technical Committee (TC), Inter-Ministerial Committee (ICC), Tegemeo Institute of Agricultural Policy and Development, Egerton University, Consultant Swedish International Development and Cooperation Agency (SIDA), and the World Bank Kenya Country Office
Agricultural Sector Development Strategy 2010-2020	Inter-ministerial Coordination Committee, Permanent Secretary, Ministry of Agriculture, Ministry of Livestock Development, Ministry of Fisheries Development, Ministry of Water Resources and Irrigation, Ministry of Cooperative Development and Marketing, Ministry of Regional Development Authorities, Ministry of Lands, Ministry of Forestry and Wildlife, Ministry for the Development of Northern Kenya and Other Arid Areas, Ministry of Environment and Mineral Resources, Agricultural Sector Coordination Unit

While the policies barely mention the role of farmers and seed producers, including women and youth farmers, farmers are *de facto* making policy by ‘implementing’ or ‘refusing to implement’ formal policies. Indeed, seed policies cannot be made meaningful without cooperation and buy-in from farmers. In the case of seed policy, creating a healthy seed system is difficult without the cooperation of the informal seed system. However, the policies designate the most power to KEPHIS, as is discussed below.

3.2.1 THE ROLE OF KEPHIS

In a meeting with KEPHIS, conducted as part of the complementary 2017 research study on the regulatory space for VPCs, officials indicated that KEPHIS is determined to insist on certified seed as the only viable option for Kenyan farmers going forward and that selling uncertified seed is illegal. At the same time the Seed Traders Association of Kenya (STAK) is pushing KEPHIS to harmonise with standards adopted by International Seed Federation and African Seed Trade Association. This would also protect farmers from fraudulent inputs being distributed, which is quite prevalent on the continent (de Boef et al., 2019; Gharib et al., 2021), albeit that the literature does not specify whether it is prevalent in the VPC sector.

KEPHIS officials also did not agree that there was not enough certified seed, but rather that information was lacking, both among those supplying certified seed and farmers who need certified. One official stated:

It is true there is seed. Those with seed do not have an idea who needs it. Those who need seed do not know who has it. As KEPHIS we can start putting up a list of seed we have certified and the name of the company to show that it is available. We can update what the private sector has for sale so we can advise the government where the seed is.

However, KEPHIS officials agreed that bottlenecks were holding up the certification process; in part this is because seed certification facilities are expensive and ensuring seed is meeting international standards takes time. When new diseases emerge, it is difficult to get results quickly enough to check for contamination before

seed is distributed to farmers. Therefore, KEPHIS needs to improve testing kits on an ongoing basis as new diseases and pests emerge, all of which is costly and time consuming. According to one seed producer, the KEPHIS officers sometimes do not have enough knowledge to do proper testing of VPC seeds and plots and “rely on hunches rather than testing to determine whether a seed is certifiable”.

Many interviewees in the 2017 research study on the regulatory space for VPCs were critical of KEPHIS; for example, a representative of Kisima, a seed potato company, said that KEPHIS does not have enough staff to do all the certifications and said a typical potato seed certification process took two weeks, during which time they could not go into production, which made it difficult to deliver certified seeds to farmers in time for the planting season. Further interviewees said the inspectors were generalists and did not have the knowledge to inspect seed for every type of crop. A manager at a seed production company said that KEPHIS had a list of potato varieties which it would certify, but the seed varieties farmers preferred were not on the KEPHIS list – this may not mean that the seed inspectors lacked knowledge, but merely that they only certified what was on the list.

So while, several interviewees felt KEPHIS needs to decentralise the inspection and certification process and make it simpler so that farmers can have their locally bred seed certified (whether produced individually or communally), which has been done in the case of flower seed and potato seed, this needs to be undertaken with caution. In the case of Shangi potato, for example, since farmers were using the seed anyway, the variety was registered in 2016 and the seed of the variety were finally certified in 2017 and make it “eligible for clean up, multiplication, certification and distribution as pre-basic or basic seed” (McEwan et al., 2021b, p. 7).

Many felt the private sector should be allowed to undertake inspections and certify seed, which the Ministry of Agriculture was in process after the 2012 Amendment to the Seed and Plant Varieties Act (Amendment 2012), albeit the new regulations mean that private sector inspectors needed to be trained and then gazetted by the minister, and it is not clear which private sector players had been approved to test seed. Further, agro-dealers, and third party/private inspectors can access training to quality of the seeds and certify them, but this involves six months shadowing a KEPHIS inspector, making it prohibitively expensive. Agro-dealers have a vested interest in selling high quality seed, since their sales depend on reputation so more feasible options are needed to allow them to register as seed inspectors (although some may have a monopoly in some areas and therefore not be concerned about their reputation). If agro-dealers knew how to, and were authorised to inspect seed, they would be able to engage in the certification process and sell seed at local level with KEPHIS playing an audit and backstopping role.

An official from the NPCK, although not referring specifically to gender, said better coordination was needed to address information asymmetries. In one county, in an interview undertaken for the 2017 research study on the regulatory space for VPCs, the local Department of Agriculture agreed there was not enough coordination between the stakeholders, and better coordination would help local farmers ensure their seed and soil health more rapidly. Because farmers are afraid of KEPHIS rejecting their seed, and because KEPHIS inspection takes time and is costly, some officials in county Department of Agriculture were conducting informal seed inspections (which is outside their mandate). He explained that:

The inspectors follow the procedure of KEPHIS, but QDS¹ is considered as clean seed and hence most of the procedure of KEPHIS doesn't apply, especially the virus tolerance level.

While KEPHIS do provide training on do provide training on seed standards and regulations to seed producers, farmers also need to know how to inspect their own seed and work cooperatively with them. Instead, KEPHIS's punitive approach pushes people away. In the focus group discussions, undertaken for the 2017 research study on the regulatory space for VPCs, one participant said that if KEPHIS said if her seed was sick and insisted that they "cannot buy seed from your neighbour, you will remain idle". This then means that they cannot produce any crops on their land, affecting their food security. In the focus group discussions, farmers said that KEPHIS's only role was telling them to buy certified seeds even though most farmers cannot always afford to buy the certified seed. According to a focus group discussion with a youth farming group, instructing them to only use certified seed and not share seed "will not sit well with us here".

A local Department of Agriculture official explained, although farmers would rather choose certified seed if it was available, farmers continue to do their own thing, because they have learnt how to survive:

How many farmers will be able to buy enough certified seed for 1 acre at 3 000 a bag. Maybe 1% of those cultivating commercially. If we ask them, "Why are you not growing certified seed?", they say "KEPHIS is very expensive" ... If they can't afford, they will continue to buy clean seed which we have already proved has bacterial wilt.

In general, starter seed used for multiplication for seed potato was too expensive for smallholder farmers, and only affluent farmers could buy the seed. But according to an FAO official, women who could not buy seed would use it if it was donated by NGOs, showing that cost is a key inhibitor of seed purchasing decisions.

This disconnect between KEPHIS and farmers is partly because of disparate views on why food is being produced – food production is not always undertaken for business reasons, and some women might be more concerned with household food security; as shown in the case studies below, even if women are producing crops for sale at the market, their primary concern might be ensuring sufficient household resources, such as school fees, buying furniture and clothing. However, one KEPHIS official insisted seed production must be approached from a business perspective on seed and farming. He stated:

We are talking here about farming as a business. Negative and positive selection will kill seed businesses for those who want to invest in this business. Then when diseases build up there is no seed. If there is money to invest, I will advise the government to invest in certified seed only.

Therefore, while KEPHIS is responsible for ensuring plant health to ensure the reputation of the institution and country is not damaged due to the spread of disease, it is not focussed on helping smallholders farmers produce or select healthy seed when they have insufficient land to ensure adequate crop rotation. Therefore, it is more concerned with large scale farmers who have enough land for adequate crop rotation, thus excluding small

¹ Quality Declared Seeds (QDS)

farmers. Hence, some farmers experience KEPHIS as more punitive than helpful and find KEPHIS to be unsympathetic as to why they do not use certified seed. However, it is also important to note that KEPHIS is most concerned about the risk of spreading disease, and in some cases seed producers (such as women and youth producing on small plots of land) have insufficient land to ensure the required isolation and rotation is undertaken. It would not fall within KEPHIS' mandate to address land access; therefore, it is necessary to see what changes to other policies can help address women's land access.

3.2.2 SUMMARY

The various policies do not provide a role for many of the seed system actors, especially women and youth, and focusses on the powers assigned to KEPHIS, without considering how other stakeholders can be empowered to participate in the process. KEPHIS has various punitive powers at its disposal, but it is not fully able to assert its role in the sector because it does not have the capacity to conduct timely inspections and speedily test large quantities of seed, so little certified seed is available on the market. It also depends on seed producers to pay inspection and testing fees, so when small scale seed producers cannot afford to get their seed inspected and tested, very little testing gets done in the informal seed sector, and seed producers may circumvent the regulations by seeking advice from others about quality seed, including local Departments of Agriculture.

Because of the way the policies have been designed, the needs of women and youth are not included and indeed, many barriers are created, such as requiring seed producers to have the financial means to run a formal, registered business, with good record keeping and proof of capital investment and the longevity of the business. This would exclude most women and youth from becoming seed producers because many lack access, control and ownership of production factors – land and finances. However, if women and youth were included through supporting access to information, teaching small scale farmers about producing quality seed to meet standards, and inspection and testing costs were affordable, pest and disease management adequate and involving them in ensuring only healthy seed is distributed, then the government would be much better able to roll out a healthy seed system in the country.

3.3 PROCESS OF POLICY DEVELOPMENT

The National Seed Policy 2010 states that the formulation of the policy was necessary to meet the needs to improve productivity in the crops and livestock sector to ensure farmers access to affordable and high-quality inputs – including seeds. The policy also outlined the needed policy and regulatory reforms in the seed and agrochemical subsector, which culminated in 2016 when the two regulations (Seeds and Plant Varieties (Variety Evaluation and Release) Regulations 2016 and the Seeds and Plant Varieties (Seeds) Regulations, 2016) governing the seed and their varieties were amended.

The policy has a single Annex listing the eight agencies that forms the Seed Policy Committee. These include the Ministry of Agriculture with 14 people; the Kenya Agriculture Research Institute with two male representatives; Kenya Plant Health Inspectorate Service with two male representatives; Seed Traders Association Kenya represented by one male; Kenya Institute for Public Policy Research Analysis represented by one male; Kenya Forestry Research Institute also represented by one male; Plant Breeders Association of Kenya represented by

one male; Kenya National Federation of Agricultural Producers represented by one female and Consumer Information Network also represented by one female officer. The identification of the officials for each of the above institution is based on simple categorisation of male and female name and it is subject to change. Nonetheless, the current identification highlights the extent to which these institutions are dominated by men.

One of the weaknesses of the National Seed Policy, 2010 is lack of stipulating clear mechanisms and indicators for its monitoring and evaluation. There is literally no provision on monitoring and evaluation in the current policy, which renders it difficult to monitor in the absence of an accompanying implementation strategy, apart from overall agricultural sector development strategies.

3.4 THE CONTEXT

In the *National Seed Policy* (2010, p. iii), the Kenyan Ministry of Agriculture states that the Kenyan seed industry had become a regional leader “with 73 registered seed merchants currently operating in the country”. However, albeit somewhat out of date, the *Potato Seed Catalogue* of 2013 (NPCK, 2013) only lists nine registered seed merchants, and five small producers involved in outgrower schemes. The policy states that protection of Intellectual Property Rights is a noble pursuit and incentive for innovation. Hence, suggesting that the Kenyan government mainly wants to focus on formal seed systems and neoliberal solutions, ignoring possibilities for strengthening indigenous, informal seed trade (Croft et al., 2018). Indeed, the push towards more regulation of seed systems can have a knock-on effect of raising seed prices due to the costs of certified seed production and time and costs involved in securing certification (Bentley et al., 2018). Therefore, government’s need to undertake a cost/benefit analysis to develop “an economically viable level of quality control” (p. 616).

The push towards the commercialisation of the agricultural sector is also evident in the *Strategy to Revitalize Agriculture* (2004) and the *Agricultural Sector Development Strategy* (2010) in which it has pushed towards formalising the seed sector and protecting breeders rights based on a seed quality defined in the certification requirements (Mucioki et al., 2018). However, the quantity of seed being produced by breeders has not increased sufficiently, and remote parts of Kenya still do not have certified seed stockists as was planned, partly because commercial companies do not consider it profitable to set up business in marginal areas where farmers are resource poor. As such, the policies have not succeeded in addressing the “unique needs and realities of smallholder farmers” (Mucioki et al., 2018, p. 572). Nevertheless, given declining yields in the potato sector (Nyangaka et al., 2010), the government continues to push ahead with policies to formalise the seed system. This involves making informal seed exchange and seed purchase illegal and insisting that seed producers and seed merchants should be registered (Mucioki et al., 2018). Despite the threat of steep fines for those not falling in line, informal seed sharing remains the primary source of seed for many farmers, and so far, none of the fines have been enforced. However, the government is not the only player shaping the context in which policies are rolling out; a key factor is farmers’s own experience with certified seed as discussed below.

3.4.1 SEED USERS’ EXPERIENCES WITH USING CERTIFIED POTATO SEED

Apart from the cost, interviews with farmers and KALRO officials identified several other barriers to purchasing certified seed. They pointed out that certified seed is typically sold in much larger quantities than many small

farmers need, so it would be wasteful for a farmer to buy such large quantities of potato seed, albeit that some ware potato farmers getting around this problem by sharing a bag of seed. Further, even if farmers could afford to buy seed, certified seed requires many inputs, which are also costly and not subsidised. Then, even having purchased certified seed and inputs, a good harvest is not guaranteed unless production is managed exactly according to specifications.

As explained by a participant in a focus group discussion, on the Nyandarua potato strategy on 18 January 2018, one man argued:

Growing seed and doing it the right way costs money. If the farmer has good farming practices and he does everything right he will get a good yield and the seed price will not be an issue. The issue is financing the seed. ... How can farmers finance from start to finish? County governments can support.

They went on to explain that if farmers could turn their production around from 8 tons per hectare to 40 tons per hectare, the price of seed would not be an issue. However, farmers needed a foot in the door in acquiring the first round of seed and inputs, and then support to achieve good agricultural practices to achieve a good yield.

Some interviewed farmers had used certified seed and experienced so much higher yields that they would not consider using local seed again. However, some interviewed farmers had experienced crop failures after using certified seeds in the context of drought. Because of this they have switched back to seeds sold on the local market and ensured protection from disease by introducing new seeds over time. Many of those who had never used certified seed did not necessarily believe it was necessary to do so: one farmer said he had good access to extension services, and the extension officer kept him up to date on any problems with local seed, so certified seed was not of interest to him. Similarly, other farmers had been getting their seed informally from the same supplier, whom they trust, for many years and believe it is good quality seed. Despite the trust some farmers have, unscrupulous seed traders sometimes purchase small amounts of certified seed and clean potato seed, then mix these with “small ware tubers to increase the volume” (McEwan et al., 2021b, p. 6). Therefore, because not all of this seed has been tested, the seed available at the local market may carry diseases, such as bacteria wilt (BW), late blight and, more recently detected, potato cyst nematode, impacting on the crop yields.

Given that farmers identified barriers to adopting certified seed, instead of punitively trying to force small farmers to adopt certified seed, it would likely be more helpful to them if the existing seed producers in their local area had access to better seed production resources, information and infrastructure. For example, for VPC seed production, sufficient land for field rotation is essential, so women’s access to land needs to be boosted; perhaps women could ‘pool’ their land in cooperatives to allow for crop rotation or they might have other innovative suggestions. It would also be important to ensure women are included in the information-supply networks.

3.4.2 A CASE STUDY OF HOMABAY SWEETPOTATO CROP AND SEED GROWERS

In focus group discussions in Homabay county, women identified sweetpotato production as women's work: they choose the seed and had "determination" to grow it. They explained that men do not know about sweetpotatoes, and men were primarily concerned with "grade maize". Sweetpotato was a primary source of income for the women, many of whom said their husbands let them keep money made selling sweetpotatoes. While many enjoyed it as a food crop and considered the orange-fleshed varieties as a good source of vitamins, women said that when they harvest sweetpotatoes and take them to market, they sell out quickly. Women spoke with pleasure about the extra income sweetpotatoes gave them. For example, one woman who attended a focus group discussion in Homabay explained:

Sweetpotatoes can change my life because even the way I am now dressed: I sold sweet potatoes and bought this dress. ... we call it ATM we use it and when we come back home sweetpotatoes carry the day.

Another woman explained that she had used her income from the sale of sweetpotato to buy a cow and was milking it, another had been sleeping on the floor but then bought a bed and mattress, and still another had even bought beds and mattresses for visitors when they came. In terms of their aspirations, women were hoping to be so successful at growing sweetpotatoes that they could eventually have money to buy a motorbike or car.

According to several women, men did not limit them in growing crops for cash, because the women used the money to ensure that expenses are covered, which takes pressure off men. Because they choose to grow sweetpotato crops, they are also responsible for choosing seed. The seed being used in the village came from several sources. For example, a variety called *nyar care*, was acquired as follows:

It was brought by the Afya people, and the white people took it. It was carried with a lorry, and it was brought to us. That sweetpotato yielded a lot.

For some of the other varieties, the women indicated that these had been passed down for generations, and they are not sure where they came from. One of the women was producing seed by harvesting at a certain time; others indicated that they asked neighbours for seed and did not pay for it. They also explained that they would give seed for free to others in their village, but would

sell to outsiders if we can bargain at 500 or 600 shillings. Then sometimes we can give them at even 400 shillings or 350 shillings.

The women felt they could identify which sweetpotato vines are good to be turned into seed because "it does not have weevils", or the varietal characteristics they prefer it should be "firm and floury", not "watery or stringy", and they also preferred the larger sweetpotatoes, since the smaller ones were not as tasty. Stringy sweetpotatoes are considered to be weevil infested, while firm roots are considered of good quality. As one woman explained:

If you have tasted it and seen that is tasty it forces you to look for that seed. So, after growing that seed, it spreads so that everybody gets it.

This shows that the seed of varieties with good traits are quickly shared, and they all have experience of the sweetpotatoes grown from good seed. They also explained that the seed needed to be mature as immature seed led to plants wilting “and it doesn’t take off well” and “if you plant the mature seed, it will not dry ... if you plant the immature one you find that it has wilted and it doesn’t take off well”. Further, they assessed the leafy part of the plants, which should be straight and not shrivelled, and should not have any worms or insects eating them. The women used insecticide on their crops to keep pests down, and if they are given seed, they plant it straight away as they do not have a seed storage place.

They also indicated that they had been given some training by the Department of Agriculture to grow an orange-fleshed variety of sweetpotato (OFSP), but when they grew it “we had no one to buy from us and we got stranded with it”. They had repeatedly experienced being given seed and told to grow a particular variety; one woman even set aside land usually reserved for maize to grow the new variety. Once she had the crop, no one came to take it to market. Hence, they were nervous about growing the seed they were given, because they could not make money from it. Indeed, one woman said: “Your heart is discouraged from it”, since they grew many sweet potatoes and could not sell them, they did not have money to buy other necessities, and the only thing available for children to eat was sweet potatoes.

The women did not know that the regulations made it illegal for them to use the uncertified seed they had been using. They said they had heard something about it, but it was not presented in a way they could understand; information flowed down from the chief to men and was discussed in community meetings (which they could easily attend), but they did not have a good understanding of the information. This confirms a previous study which found information asymmetry is women and men’s different access to information about agricultural policies and institutional arrangements (Nyongesa et al., 2017). Once they heard about the legislation in the focus group discussion, they wanted to find out how they could get their seed certified. In particular, they said that the *nyar care* variety was a good quality seed and they hoped they could get it certified. However, they would need to have ways to address access to sufficient land to ensure proper field rotation.

If they could not get their seed certified, they were unsure how they would proceed because they did not have money to buy the certified seed on the market. They said they sometimes bought certified seeds for some crops if they had money, but if they did not have money they reverted to traditional crops. However, they also indicated that the seed was provided in bulk, and they did not have land or time to grow such a large quantity of seed.

In another Homabay focus group discussion, the women looked at two models through which their seed could be certified:

- i. Seed production companies would pay women to have their seed certified by KEPHIS and would inspect the fields where crops were grown. To take part in the scheme, farmers would pay 300 shillings to the company a year and would also need 5 acres of land.
- ii. The county would certify the seed produce by women and the seed could be shared both within and outside the county.

In the first model, women were concerned that it would be difficult for them to access 5 acres (when they had bought 1 acre of land previously, they experienced a lot of push back when they wanted to use it and the chief and assistant chief had to come and resolve the matter). Women said they would not be able to purchase 5 acres of land because they would need a loan to do and for that they required collateral, which they did not have. In a focus group with men, they said that even if they had the collateral to take out a loan, it would be too difficult to find anybody to lease from that owned a large enough plot to reach the 5-acre requirement. The contestation around land needs to be addressed in policy so that women can access the 5-acre requirement – collectively or individually.

The women did recognise the benefit of the model but wondered whether such a contract would be honoured, and were also concerned that they would have to accept a price upfront and could not negotiate later, regardless of how much they spent on inputs or any other extra costs:

The challenge is that for this model, what you have agreed on is what they pay you ... sometimes you can find that you use a lot of your money, so that when the duration is over you find that you cannot even get something from the seed that has been in your land.

While some also had concerns that women would be in but not contribute their share of labour, others suggested that women who did not contribute would be fined and not receive full benefits from the sale of crops. In any case, women indicated that most people involved in sweetpotato production do so in pairs or in groups, because it is labour intensive, so they did not have strong concerns about women make sufficient contribution.

In the case of the second model, women felt that it would have the benefit of not having to travel far and also that it was easier to make county government aware of local needs than it would be to influence higher levels of government. However, they also said they would be suspicious of a model run by the county as they thought there would be corruption, including that the county may distribute funds to farmers unequally, which would lead to increased poverty for some. They were also unsure of who would represent them in the government, should they have problems to bring up. They suggested setting up a women's group to oversee what the county was doing and to protect women's rights:

We will need someone who will advocate for women's rights because the woman is the one who has carried the biggest role of the family, and she is the one who has no right at all.

Therefore, the women did not have a strong preference for either model but had thoughtful ideas about how each model could be made to work. However, the 5-acre requirement was a limiting factor in each case, and neither women nor men knew how to overcome that challenge. This highlights that to address gender inclusion in the VPC sector, action is also needed on women's equal access to land.

3.4.3 A CASE STUDY OF NYANDARUA'S SEED POTATO PRODUCTION GROUP

Given that potatoes are the most important produce in Nyandarua, they provide food for themselves and livestock, income and employment. Nyandarua also provides 33% of potato in Kenya. However, some community members only focus on growing potatoes because seed production is labour-intensive, takes longer

to produce, and more regulations are involved, which can be difficult to follow. By contrast potato grows quickly but must be grown on higher quality land to protect plants from disease.

Women and young people often do not own land or machinery in the community, unless they are unmarried and inherit land. On rare occasions, women and men have joint ownership of land but usually men own the land and tools and give women access to them. However, both women and men have access to bank loans: men apply for loans using their assets and women use co-guarantee arrangements. Groups of farmers also access finance and pay of the loans bi-annually, while individual farmers pay off loans in monthly instalments.

However, even for men, only small plots of land are available and climate change also negatively impacts their production, so they are not able to grow large amounts. Some also have poor quality soil and are not able to afford new land or fertilizers to fix this. Seed producers also have trouble gaining access to certification for their seeds, since the processes needed for certification include expensive inputs such as fertiliser and insecticides, which are very expensive, and often outweigh the amount made selling the seeds. Accordingly, certified potato seed production in the area is declining, and many potato growers rely on their own seed, that acquired from neighbours, and occasionally, that from KALRO.

A county official in the areas said that they also had

... inadequate storage facilities high post-harvest losses, low yield to poor soils. Some measures that have been taken include training farmers, linking farmers with the value chain players, formation of cooperatives, subsidized fertilisers. The county is also demonstrating the use of mechanized potato farming and also plans to put up a processing factory to make potato profitable and to add value.

At meetings of the Nyandarua's seed production group, the members pointed out that seed potato certification had been gazetted in 2012, yet no accredited private sector potato seed producers seemed to be operating. The group had received some funding to set up a seed production system and produce seed that can be certified. In a meeting, they discussed several concerns they had, which would give them challenges in becoming certified seed producers.

The key issues were, how to address farmers' needs, how to persuade farmers to use the seed (demonstration fields, and marketing and information brochures), and how to ensure that farmers have a ready market waiting to buy their produce once their yields become high. However, they also discussed the possible downstream activities that could be developed so that farmers could sell their produce; this included processing factories to produce potato crisps and small cottage industries making crisps, chips, extracted starch, and using the peels to make alcohol.

Farmers' and seed producers' needs

In the meetings the group discussed two sets of needs, (i) seed, inputs and soil; and (ii) adequate infrastructure and equipment, each of which are discussed below.

Seed, inputs and soil

A major challenge for the seed producers in launching the group was that they knew farmers might not be receptive to buying certified seed. In particular, they highlighted an interlocking system of seed purchasing, input purchasing, and soil testing. They recognised that it would not help farmers to simply purchase the seed if their soil had problems with pests and diseases, including bacterial wilt diseases. Further, farmers could not be advised what fertiliser was best for them without know about their soil fertility and health. However, soil testing was a challenge, as stated at one group meeting:

A farmer can come to pay 30 000 for soil sampling and yet he can't even buy one bag of fertilizer? Surely, you must be joking?

They thought the solution was for the county government to provide soil testing services, however, they knew that setting up a lab at county level might be too expensive and might be too difficult to manage. Further they felt a local lab might not be fully utilised even if they could find the right staff to “manage it professionally”. As an alternative, they suggested that farmers should have access to rapid testing kits so they could test their own soil, which would require farmers to be trained.

Infrastructure and equipment

They group felt that if farmers were going to increase yields, they would need better equipment, but that small farmers would likely not be able to afford all the equipment and machinery they needed. They therefore saw it as necessary to make shared equipment available locally, noting that the appropriate tools and equipment may vary depending on the size of the farm. However, they were not clear on what exact equipment they needed or should promote; while they knew that harvesters could be useful, they said:

People who go for such machinery are people who are having 2 acres and above. Less than that usually people do not find it to be economical.

They then discussed whether it might be better to provide walking tractors, however, on group member said that when the soil was wet it was difficult to harvest with a walking tractor, and they usually harvested when the soil was wet. However, another group member pointed out that

in Holland they harvest throughout the year whether is wet or dry. Maybe it is the machines they use. Maybe they use the big ones.

Another suggested that they might be able to harvest all year round in The Netherlands because they had different soil conditions. They did not conclude with a decision about what equipment they would invest in but pointed out that part of maintaining and producing healthy seed was also ensuring that infrastructure and equipment did not cause contamination. For example, one group member said:

Also, we need uncontaminated water tanks to ensure seed is not infected by irrigation.

This is especially true if the water collected is run off from a neighbouring contaminated field.

They argued that tools, machinery and equipment could equally be involved in spreading disease. This was especially a concern when farmers are sharing the equipment:

There is need to ensure that when leased, tractors are disinfected from one farm to another otherwise there is risk of spreading disease. There are some reported cases of PCN [Potato Cyst Nematode] being spread by use of tractors...a farmer who was farming on virgin land introduced PCN through use of tractor which he was hiring to others.

The cases of PCN are confirmed in the literature; egg density for *G. rostochiensis* in 5 sub-counties of Nyandarua County “varied between 30.6 and 158.5 viable eggs/g soil, with an average egg viability of $78.9 \pm 2.8\%$ (min = 11.6%, max = 99.9%)”, and this was mainly prevalent in Shangi potato, which was preferred by 65% of farmers because of “its shorter dormancy and cooking time” (Mburu et al., 2020, p. 1). However, this study indicated that it is unknown how long the nematode had been prevalent in the area or where it had come from.

This section reveals that the group had a good grasp of the issues that they faced in producing seed and the issues that they were likely to face if they tried to persuade farmers to adopt their certified seed. Therefore, they felt that they would need to make some effort to convince the farmers to adopt their certified seed, as discussed below.

Demonstration plots, marketing and information

The group felt that if they were to get certification for their seed, they would still have difficulty marketing the seed. Therefore, they decided to set up demonstration plots, where the produce would be grown using their seed. Once they could demonstrate increased yield with the seeds, farmers might be interested.

However, as one meeting participant stated:

Maintaining distance between different varieties of seed is difficult due to small plots of land, for example, if they want to produce three types of potato, they cannot grow them far enough apart to be assured of seed purity.

As discussed in the literature review, women’s poor access to land was a key inhibitor of them becoming involved in formal seed production (Ndiritu et al., 2014; Otieno et al., 2021; Ouma et al., 2006). Even men indicated that they had difficulty accessing enough land for growing potatoes or producing seed. Furthermore, because setting up a demonstration field and getting certified takes time, those at the meeting were concerned that they might not be able to produce enough in time to get seeds to market. As discussed in section 3.2.1 above, seed production companies have previously complained about the amount of time it takes for KEPHIS to certify a seed, and this is a key concern in this case study.

Apart from convincing farmers with a demonstration crop, the group also emphasised the need to market the seeds and provide farmers with relevant information. The group discussed that marketing needed to promote not just the certified seed but also suitable equipment for growing potato crops, such as potato graders. For this reason, the group was intending to produce brochures to market the seeds and equipment. However, they did not see the brochures as only promoting their seed. For example, one group member said:

We need to develop a brochure to circulate to 7 000 farmers explaining best practice, recommended rates of fertilizer application or other good agronomic practices.

They also indicated that they would give farmers brochures as they came for training, so that they would have something to refer to when they began planting, looking after the crops, and harvesting.

Financing

While the group had some initial start-up funds, they recognised that if they persuaded farmers to use certified seed, it might not provide a steady income stream for them. If they used their funds to subsidise provision of seed in the first year, they might not have farmers buying seed again for a few years, because “often farmers use certified seed but use it for several seasons before they come back to buy more”. This is the nub of why it is difficult for small-scale seed producers to get off the ground – they cannot sustain the market needed to become profitable. They therefore felt that the best strategy, rather than subsidising seed, would be to “encourage banks to micro-lend to women and youth farmer groups” so that they could afford to buy their own seed.

Summary

The case study shows a wide range of consideration that seed production groups need to make if they are going to operate successfully. Policy should be able to take account of these issues and develop support systems to ensure that quality seed can be produced at local level, and with the appropriate coordination, should involve consideration of the whole production system – from seed production through to downstream activities such as food processing. In addition, the case study highlights the need for training and capacity building to be a key part of involving farmers in selecting certified seed. This includes the need for a special focus on women and youth groups.

3.4.4 IMPROVING THE QUALITY OF FARMER-MANAGED SEED

Officials of the Kenya Agricultural and Livestock Research Organization (KALRO) pointed out that the cost of testing meant only wealthier farmers could afford to have their seed tested or purchase certified seed. The official said that rather than setting the unrealistic expectation that all seed would be certified, it would be better to work with local farmers to increase their knowledge of seed health, plant health, soil health and crop diseases. According to an FAO official, Kenya’s formal seed system is an oligopoly of a few large producers. If farmers had the ability to check their own seed, they would likely ensure their seed is of the highest quality, without having to buy from seed oligopolies at high prices. As an FAO official pointed out, “public extension services are over-stretched and need young blood”. Properly trained extension workers could also work with farmers to ensure the quality of seed and inform them about diseases and pest.

In the focus group discussions one participant said that the government should “cluster farmers in ecological zones so that they work together” to produce seed at local level. The KALRO official suggested that also suggested that seed production at local level should be subsidised to ensure quality, disease free seed. Another KALRO official said it was necessary

... to promote research and technology adoption; and research and development (including establishment of SMEs in the potato sector.

Many of those interviewed and who took part in focus group discussions or meetings pointed to the need for the certification system to be much more localised, working with farmers to ensure seed was of high quality, and providing relevant information and training about disease management and eradication at local level. As discussed in the literature review, ensuring women are involved in such training is a key to boosting production for food crops, but also feed information into women's social networks so they are all better informed. While women were already producing seed, they sometimes did not have formal knowledge of how to test or assess that seed. One woman farmer from a group of small seed producers (including 21 women out of 52 producers) said their seed had not been inspected as formal inspection would be costly for the group.

A participant in one of the sweetpotato Focus Group discussions, said that most of the farmers working the plot were women. They had only small pieces of land and inadequate knowledge of certification process. Therefore, training women farmers to assess and test their seed would ensure plant health, while also engaging women on how to secure access to sufficient suitable land for production. While the FGD participant underscored the need to train women, they also said:

Mostly women don't come in community meetings. Sometime the husband refuses the wife to participate.

Therefore, if the Ministry of Agriculture rolls out systems to train farmers, their plans need to have a specific focus on involving women's groups in the training. Thus, a gender-sensitive approach is necessary, even though, as one participant in a focus group discussion pointed out:

It's difficult to get women involved because you need land to produce seed and not many women have land. We need to set up women's and youth groups to train them in seed production

4 DISCUSSION

4.1 CONTENT

As this paper shows in discussing policy content, apart from the Agricultural Sector Gender Policy (2013), none of the policies related to seed include any mention of women or gender. While the *Agricultural Sector Development Strategy* (2010) is concerned with boosting food security, it mainly sees this as a side effect of ensuring farmers earn higher incomes, suggesting that the strategy foresees a situation in which most farming is commercial farming. This large scale commercial business model for farming and seed production is further confirmed in the National Seed Policy (2010) and Seed and Plant Varieties Act (2012); the former acknowledges the informal seed system, but focusses on the formal seed sector, while the latter makes no mention of the informal sector, or indeed of any possibility for seed production which falls outside the ambit of the formal sector.

Because of the formal business-minded thrust in the policies, the informal seed sector is not embraced in policy, and the policies further do not consider women's roles in seed production and the barriers these policies are creating for women who want to produce and share or sell seed. Women are excluded from the policy not just because they are not mentioned, but because the policy creates huge barriers for women who might want to undertake seed production and have their seed certified.

The thrust of the policies is that seed growers and merchants must be registered, seed plots must be registered (so they can be inspected), and seed may then be certified, and only certified seed of released varieties may be sold as seed. Because seed producers and seed traders are assumed to be formal businesses, the Seed and Plant Varieties Act (2012) assumes that seed producers would be in a position to pay for their seed to be regularly inspected to assure seed quality. The regulations and KEPHIS's interpretation of the legislation create a situation in which very few seed producers can be registered, firstly because they do not have the financial capital referred to under the law, and secondly, because they might not be able to pay to have their seed inspected. Because the regulations do not take into account the realities of informal seed production, they assume that it is a simple matter for informal seed producers to be incorporated into the formal seed system by following the prescribed steps, paying the costs, and meet the standards, without any consideration of the difficulty of these steps for many informal seed producers – including women. For example, the assumption that seed producers can keep adequate records may actually be onerous for those who earn small sums of money from seed production, and who may not be familiar with modern recordkeeping systems. Instead of bringing seed certification within the grasp of informal seed producers, the tone of the amendment of the Seed and Plant Varieties Act (2012) is punitive, and much of the Act is given over to explaining the criminal proceedings relevant to either falsely claiming seed is of a released variety when it is not, or selling seed that has not been inspected.

It would be preferable to create a staged approach including steps by which informal seed producers (especially women and youth) can gradually move into the formal sector, by providing access sufficient suitable land, training on production methods, guides to ensuring seed health, *and* skills for building small business enterprises.

4.2 ACTORS

Many policy discussions in the seed sector have been heavily influenced by private sector business interests and donor organisations who support a market-oriented approach to quality seed delivery. Although a key stakeholders, seed users and seed producers in the informal sector have not been involved in the policy creation processes, and it would be essential to remedy this lack of involvement, including by deliberate inclusion of women seed users and seed producers in the informal sector. No seed policy can be effective without the buy-in of small-scale seed users and seed producers.

As the main body responsible for registering and certifying seed, KEPHIS falls in line with the assumption that seed production is a business for commercial gain, as reported above one KEPHIS official insisted: “We are talking here about farming as a business. Negative and positive selection will kill seed businesses”. While it is necessary to set seed standards and therefore KEPHIS has a beneficial role to play, it is important to consider how those in the informal seed and VPC production sector can be brought on board to create healthy seed systems and acknowledge that this may not look like the formal business model proposed by the government. As McEwan et al. (2021b) some small seed producers appreciate the insight that KEPHIS can give them because they can see problems with the seed that producers cannot.

However, McEwan et al (2021b, p. 18) argue, stakeholders in the sector such as the NPCK, local Departments of Agriculture, KALRO and farmers, (including women and youth) agreed that the better option was to “for the Government to focus more seriously on local seed producers and sellers to address quality concerns”.

These other stakeholders explained that to deliver on seed health, small scale farmers, especially women and youth farmers, needed better access to information about seed and crop health, and emphasised that government should be working with women and youth groups to share important information with them. Such an approach does not rely on punitive measures but recognises that farmers would want to access affordable good quality seed to boost their crop production if they could access the necessary information and skills in an affordable way.

4.3 PROCESS

As interviews and focus group discussions show there is weak participation of women and youth in the formulation and implementation policy and strategy and initiative related to seed potato in Kenya. Our analysis shows that key actors in the potato seed sector have divergent views on how they view the production of potato seeds in the country. We find that not every state agency or institution is ready to stick to one prescribed policy solution because of the realities on the ground such as lack of adequate certified potato seed. It is likely on this basis that the state and county level departments of agriculture continue to promote the use of both formal and informal seeds including uncertified “clean seed” which is in principle in violation of the country’s seed regulatory framework (McEwan et al., 2021b) that these departments signed to. Unlike the agricultural departments, however, the state agency, KARLO, charitable foundations, CIP, NGO and donor-funded projects have focused on training farmers to improve their on-farm seed quality which is central in maintaining the quality of seed recycled and shared by farmers.

4.4 CONTEXT

To ensure that men, women and youth farmers can access the highest quality seed, it is necessary to optimise seed production, optimise quality assurance, and optimise seed distribution (Spielman and McEwan, 2020). While the government has relied on KEPHIS and the market to ensure the above optimisations, many of the factors outlined above mitigate against market delivery and mitigate against KEPHIS having a deep enough reach into many areas where seed production is taking place. Even when KEPHIS does reach far flung areas, the responsibilities of different layers of government mean that it is unclear who is responsible for what. Optimising seed production, quality assurance, and seed distribution involve having more skilled people with relevant access to information to make an optimised seed system work. This indicates that small scale farmers and informal seed producers (including women and youth) need to be trained and informed about an optimised seed system and need to become partners with government in achieving optimisation.

It becomes impossible to know whether/when the informal seed sector (in which women are key stakeholders) is producing healthy seed, because they do not have financial access to the certification process. Therefore, the policy creates a situation in which inequality is perpetuated, despite the claims of the *Agricultural Sector Gender Policy* that it aims to reduce inequality. Given the punitive measures proposed, women farmers are now at risk of being prosecuted for undertaking farming the same way they have for generations.

As the case study showed, seed optimisation is also not a stand-alone matter. In the seed production group, many concerns were raised about affordability for small holder farmers (of seed, inputs, soil testing and infrastructure and equipment): even when achieving great yields, women in this study reported that they had problems getting the produce to market, and therefore they were reluctant to invest so much time in producing such a large quantity again. The Nyandarua potato seed producers' group, like those interviewed and those who participated in focus group discussions, also pointed to the need for much more effort to be put into informing small holder farmers (including women and youth) on a range of issues – not just the advantages of certified seed – but also the necessary farming procedures and land, inputs and equipment required; the Nyandarua women felt that they could not persuade others to adopt their seed without paying attention to information needs. Both KALRO and the seed production group also pointed to the need for subsidies to support seed producers, and subsidies to enable farmers to get a step up into buy certified seed.

Therefore, a preferable option in seed policy might be to support bridge seed development in a combination of formal and informal seed systems “in community-based, on-farm ‘seed bulking’ programmes, supported by government scientists and extension agents and using improved ‘composite’ materials adapted to local conditions” (Brooks, 2014, p. 53). Given the prevalence of diseased seed and soil in the potato sector, this might be difficult to achieve but, for example, in the case of Shangji potato if farmers' reasons for using the variety are not acknowledged, and if officials do not collaborate with farmers to overcome the problem, farmers may continue to ignore calls for certified seed use. Ensuring that farmers have adequate information is one part of the equation, but the other is creating partnerships based on trust. It is difficult to insist on ‘trust’ in a policy but wording such as ‘partnerships’ and ‘collaboration’ can encompass this idea. This can also be incorporated into guidelines on bolstering and rebooting extension services: such services should not only boost smallholder

farmers' knowledge base about available technologies but should also establish that the extension officers are partnering with farmers to ensure seed and crop health; this could lead to transformation in the sector if it is implemented (Government of Kenya, 2010).

With cooperation from extension services and scientists, women can be trained in "gender-responsive participatory plant breeding (PPB)", which will help to address women's challenges in producing quality seed: "women and men farmers and scientists together to assess and improve varieties under local farm conditions, including selecting locally preferred traits" (Kramer and Galiè, 2020, p. 2).

Apart from the considerations for farmers and seed producers, policymakers also need to acquire the knowledge and skills to understand seed-system needs, so that farmer and seed producer needs are "better incorporated in policy and programming" (Mucioki et al., 2018, p. 2). This means building collaboration across the whole value chain, through mandated regular communication, informative events, and consultation meetings (that are not just a tick-box exercises). In considering collaboration, officials need to be gathering information and knowledge from farmers and incorporating that into policy, while at the same time providing relevant scientific information, farming and business skills. For example, laws and policies should defend the "rights of breeders and communities over their genetic resources and protect indigenous knowledge and promote gender equity" (Louwaars et al., 2013, p. 83).

In sum, the policies at present seem to be intent of shutting down the informal seed system using punitive measures. This would likely devastate small scale farming, especially small-scale farming undertaken by women, with knock-on effects for food security. The policies should rather assume that small farmers – especially women and youth – have much to gain in using healthy seed and should therefore focus policy interventions on how to better include them in seed systems, including through better access to land, and including them in ensuring seed is healthy.

5 CONCLUSIONS AND RECOMMENDATIONS

To conclude, this paper summarises the gaps in and problems with the policies (in conclusions) and the opportunities available for making policies more amenable to conditions on the ground (recommendations).

5.1 CONCLUSIONS

This paper sought to examine Kenya's seed policy process and discuss the gender-sensitivity of how VPC seed policy decisions are made. It thus assessed the context in which seed policies are implemented; how the content of seed policies can differently affect men and women farmers' participation and access to seed; and it provides recommendations on how VPC seed policy can be made more inclusive of women and youth. The paper shows that an understanding of the needs of farmers and seed producers, especially women and youth is wholly missing from policies. Because seed policies focus on the formal sector and assume that farming and seed production will be a commercial enterprise, it is difficult for women and youth to participate in seed production and policies aggravate inequality. Also, based on the assumption that seed production will be a commercial exercise, the policies prescribe a business model for running the enterprise, including finances it deems as sufficient, and adequate record keeping.

The paper shows that the current seed policies and existing legislation barely mention women and youth apart from the Agricultural Sector Gender Policy 2013. Instead, we find that many policy discussions in the seed sector are heavily influenced by private sector business interests and donor organisations who support a market-oriented approach to quality seed delivery. The lack of women's representation and heavy influence of private sector could be addressed if key stakeholders, seed users and seed producers in the informal sector are fully engaged in the policy formulation processes, including by deliberate inclusion of women seed users and seed producers in the informal sector.

The paper observes that current VPC seed policies seem to be intent of shutting down the informal seed system using punitive measures. If left unchanged, and then fully enforced, the policy and its accompanying legislation are likely to devastate small scale farming, especially small-scale farming undertaken by women, with knock-on effects for food security. Instead, the current authorities mandated to carry out seed testing and certification (KEPHIS) and evaluate breeding materials for developing new varieties KALRO have better chances of success in improving seed produced and recycled by smallholder farmers including women and youth if they focus policy interventions on how to better include them in seed systems and include them in ensuring seed is healthy. No seed policy can be effective without the buy-in of small-scale seed users and seed producers. As McEwan et al. (2021b) show some small seed producers appreciate the insight that KEPHIS can give them because they can see problems with the seed that producers cannot. Indeed, as McEwan et al (2021b, p. 18) argue, stakeholders in the sector such as the NPCK, local Departments of Agriculture, KALRO and farmers, (including women and youth) agreed that the better option was to "for the Government to focus more seriously on local seed producers and sellers to address quality concerns".

Furthermore, even though the aim is to make seed policy more inclusive and supportive of women, it is important to recognise that gender differences are based on socially-constructed power relations, therefore, “[i]nterventions with a women-only focus risk limiting their aim to enhancing women’s agency without addressing underlying power structures” (Ihalainen et al., 2021, p. 169). Indeed, if programmes are perceived to favour women, men may feel threatened, “which can lead to backlash” (McDougall et al., 2021, p. 370). For example, attempts to address women’s access to land would have to be carefully managed in a way that does not undermine men who are likely to feel disempowered if their land is transferred to women. Nonetheless, despite these challenges in the VPC seed sector this paper argues that there is considerable scope to develop gender responsive VPC seed policies, as well as policies that consider the role of youth in the VPC seed sector. But to make progress on this front, there is a need to integrate gender considerations beyond the level of local seed production projects and into the larger, evidence-based discourse on seed system reforms. To that end, this research provides novel insights and recommendations on ways that gender can be integrated into policy processes.

5.2 RECOMMENDATIONS

Since the Kenyan government has embarked on seed sector modernisation, it is central that the spirit of the reform takes on board gender sensitive approaches which include not only gender dynamics in seed production and sharing but also inequitable access to resources due to the structural constraints women and youth face, and information asymmetries issues. As such seed policies need to have a specific focus on supporting women in the sector, since they typically have even less access to formal seed markets, productive resources – land and finances. To achieve this, it is important that policy makers rather focus on acknowledging and including the informal sector in the overall seed system, rather than punitively trying to force farmers to buy seed they cannot afford. Specific recommendations are depicted in *Table 4*:

Table 4: Gender and youth sensitive policy and regulatory options in evolving Kenya’s VPC seed systems

Recommended option	Explanation
Increase women and youth representation in policy formulation and implementation processes	Introduce clear guidelines and requirement for gender and youth inclusion in VPC policy review, formulation and implementation processes.
Invest in information and training on how to maintain seed health during seed production	Farmers, including women and youth, need to receive information and training on how to maintain seed health during seed production, they should also have a step-by-step guide to explain the procedures and costs of having seed certified so that they may be included in producing quality seed, and not excluded from it.
Repeal punitive measures in seed policy, 2010 and Seed and Plant Varieties Amendment Act, 2012	Except in the case of deliberate seed fraud, introduce more collaborative approaches with farmers – including women and youth – to improve the quality of seed available in the informal seed system and guide formal seed producers through the certification process as alternative to current punitive measures provided for in the current policy and legislation governing VPC seed system

Reform land policy and laws to allow women and men seed producers to have secure plots for VPC	Because growing VPC seed requires large areas of land for rotation (at least 5 acres) ensure land reform takes onboard the needs of women and youth to have access, use and control over suitable and enough land for VPC seed production and trade.
Lower cost of seed certification and simplify its complex business requirement	Ensure the if certification cost cannot borne by public authorities, it is set within the rates that farmers, especially women and youth can afford.
Invest in the provision of crop inputs, infrastructure and equipment	Support women and youth to have the means to maintain seed health, including exploring how best to provide crop inputs, infrastructure, and equipment.
Preserve diversity in the VPC seed system	Preserve diversity in the seed system, by engaging women who have for generations protected the genetic varieties of their VPC seeds. This means certifying as many seed varieties as possible within the seed and soil hygiene parameters and seeking to protect such seed as small-scale farmers have been producing and using for generations.
Reform seed policy to include gender-sensitive monitoring and evaluation indicators	Develop gender-sensitive monitoring and evaluation indicator in the Seed Policy and its implementation strategy are monitored and evaluated from time to time.
In line with the Gender Policy, other policies, especially VPC seed policy should make provisions for women to access more land	It will be impossible to boost women's role in VPC seed production, unless they can jointly or individually access sufficient land for adequate field rotation.

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The CGIAR Research Program on Roots, Tubers and Bananas (RTB) is a partnership collaboration led by the International Potato Center implemented jointly with the Alliance of Bioversity International and the International Center for Tropical Agriculture (CIAT), the International Institute of Tropical Agriculture (IITA), and the Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD), that includes a growing number of research and development partners. RTB brings together research on its mandate crops: bananas and plantains, cassava, potato, sweetpotato, yams, and minor roots and tubers, to improve nutrition and food security and foster greater gender equity especially among some of the world's poorest and most vulnerable populations.

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