



FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative



Emergency Seed Interventions, Subsidies and Seed System Development



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ACRONYMS AND ABBREVIATIONS

ACDP	Agricultural Cluster Development Project (Uganda)
AIMS	Agricultural Input Suppliers Association of Malawi
AISP	Agricultural Input Subsidy Program (Malawi)
CRS	Catholic Relief Services
DAI	Development Alternatives Incorporated
DRC	Democratic Republic of Congo
FAO	Food and Agriculture Organization of the United Nations
FISP	Farm Input Subsidy Program (Malawi)
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IDPs	internally displaced people
InovAgro	Innovation for Agribusiness (Mozambique)
ITF	input trade fair
KCEP-CRAL	Kenya Cereal Enhancement Program – Climate Resilient Agricultural Livelihoods
LSB	Local Seed Business (Uganda)
MDG	Millennium Development Goal
MK	Malawi Kwacha
MT	metric tons
NA	not available
NAARO	National Agriculture Advisory Services (Uganda)
NARO	National Agricultural Research Organization (Uganda)
NGO	non-governmental organization
OWC	Operation Wealth Creation (Uganda)
PESU	Programa de Emergencia para Sementes e Utencilios (Mozambique) Emergency Program for Seeds and Tools
QDS	quality declared seed
S34D	Supporting Seed Systems for Development
SEMOC	Sementes de Mocambique lda Seeds of Mozambique Ltd
SNS	Servico Nacional de Sementes (Mozambique) National Seed Service
STAM	Seed Traders Association of Malawi
TBC	to be confirmed
UN	United Nations
USAID	United States Agency for International Development

1. Introduction

Donor- or government-funded seed distribution – whether through emergency interventions or subsidy schemes – has long been seen as a serious constraint to seed system development (Tripp and Rohrbach, 2001). This briefing is based on a review of literature from Malawi, Uganda, Kenya, and Mozambique and explores the changing nature of seed distribution through emergency interventions and subsidy programs. Whilst there have been some positive shifts in the ways in which seed is provided, free or subsidized seed distribution continues to present serious challenges to efforts to develop sustainable market-based seed systems.

This briefing explores the impacts of free or subsidized seed distribution on the formal seed sector and highlights alternative mechanisms for emergency seed provisioning that contribute to greater resilience and avoid creating market distortions and weakened seed systems. It is recommended that more coherent and coordinated development, resilience and emergency approaches are realized through greater clarity in the rationales, objectives and design of specific interventions. The recent expansion of resilience programming creates new opportunities for innovative, longer-term approaches in response to emergencies.

2. Different rationales, same seed

There are two quite different rationales for subsidy schemes and emergency interventions involving seed. For agricultural input subsidy schemes, the rationale is to make improved inputs available at reduced cost to incentivize their adoption and thus increase productivity (Hemming *et al*, 2018). For emergency seed interventions, on the other hand, the documentation to justify such interventions commonly refers to the need to restore livelihoods and food security. Despite these very different rationales, both types of interventions provide seed of improved varieties from formal sector seed sources.

It can be argued that it is not necessary for emergency seed interventions to provide formal sector seed of improved varieties. The restoration of livelihoods and food security requires that farmers are able to plant the seed that they would normally use. Smallholder farmers in developing countries do not normally plant seed from the formal seed sector; as much as 90% of their seed comes from informal seed systems (Hoogendoorn *et al*, 2018; Louwaars and de Boef, 2012), even in emergency contexts (McGuire and Sperling, 2016). Despite this, emergency aid agencies and donors prefer to provide formal sector seed. This is sometimes because emergency seed distributions are seen as a way of promoting improved varieties among farmers, but mainly as a way of ensuring that the seed provided is of good quality. This assumes that seed from the informal seed sector is of poor quality, which is not necessarily the case.¹ The informal seed sector is known to be extremely resilient; in emergency situations, there is generally no lack of seed among affected farming communities but a lack of access to seed by poorer, more vulnerable farmers.

¹ The quality of seed from the informal seed sector – particularly farmer-saved seed – has been shown to be good quality seed of locally-adapted varieties, and it is what farmers are familiar with (Bishaw *et al*, 2012). The quality of seed from local markets tends to be highly variable, depending on whether or not informal traders make a distinction between seed and grain.

Across the four case study countries, both emergency and subsidized seed distributions have involved changes in the programming modalities used for seed provisioning; in many cases, direct seed distribution has shifted to vouchers and distribution through agrodealers, though direct seed distribution still occurs in some instances^{2,3}. The first manual for seed vouchers and fairs in emergency contexts (CRS *et al*, 2002) advocated for seed to be supplied from both the formal and the informal seed sector, allowing farmers to choose their preferred crops and varieties according to their own quality standards.⁴ For the four countries included in this review, however, current programming approaches are such that vouchers must be exchanged for seed from the formal seed sector. Electronic vouchers have been either piloted or implemented at scale in Uganda, Kenya and Mozambique, often involving a reducing subsidy level over multiple seasons, after which farmers are expected to be able to afford the full cost of the inputs (Box 1).

Box 1. Overview of free and subsidized seed distribution in the case study countries

Malawi has had a continuous series of large-scale subsidy programs since the 1990s. Quantities of seed and the number of beneficiaries have varied over the years, between 4,000 and 10,000 MT annually. The latest program is the biggest yet, with over 21,000 MT of seed for 4.3 million farmers. Further details are presented in Annex 1.

In **Uganda**, on-going emergency seed interventions for internally displaced people (IDPs), refugee and host communities began in the late 1980s, and have been estimated to provide as much as 10,000 MT per year. The main seed subsidy program, Operation Wealth Creation (initiated in 2014 and winding down since 2018), has been replaced by the World Bank funded Agricultural Cluster Development Project (2015-22), which involves a reducing subsidy scale over three seasons, after which farmers are expected to be able to afford the full cost of the inputs. See Annex 2 for further details.

In **Kenya**, the National Accelerated Agricultural Inputs Access Program (2007-14) was a relatively small, targeted subsidy scheme focused on maize seed and fertilizer. Regular and repeated emergency seed aid was provided from the early 90's up to at least 2011, mainly in response to drought or floods in semi-arid areas. This has partly been replaced by a long-term climate resilience program, as described below.

Mozambique has had relatively small, intermittent, short-term subsidy programs in some provinces. Large-scale emergency seed distributions that began in the post-war period have continued in response to recurring natural disasters and involved various shifts in the transfer mechanisms; from direct distribution to vouchers with input fairs, to vouchers without fairs, to electronic vouchers within a large-scale UN food security program. The e-voucher mechanism was then adapted for use in the emergency response to Cyclone Idai in 2019. See Annex 3.

² Many aid agencies changed from vouchers and seed fairs to direct distribution during the Covid-19 pandemic, because lock-down restrictions prevented the gathering of large groups that typify seed fairs.

³ Direct distribution tends to be based on the premise that there is no seed available locally and must be brought in from outside the area. Voucher-based distribution assumes that seed is locally available, but some farmers lack access to it, i.e. they lack the means to be able to purchase it.

⁴ For emergency seed interventions, the shift away from direct seed distribution to voucher-based programming was prompted by the realization that seed access, not availability, was often the problem. Direct distribution tends to be based on the (often assumed) premise that there is no seed available locally and must be brought in from outside the area. Voucher-based distribution is appropriate when seed is locally available, but some farmers lack access to it, i.e. they lack the means to be able to purchase it.

3. Impacts of seed relief and subsidies on private sector growth

Both the establishment and expansion of the private seed sector is influenced by subsidy and relief programs. The level of influence varies according to the level of maturity of the seed sector as well as the scale of free seed provisioning. In both Uganda and Mozambique, the emergence of the formal seed sector was closely connected to large-scale post-war emergency seed programs. SEMOC, the national seed company in Mozambique, for example, was established in 1988, the very same year that the donor-funded Emergency Program for Seeds and Tools was initiated. SEMOC grew rapidly, and 90% of its seed was sold to the emergency program (Howard et al, 2001). This might be seen as a positive influence; indeed many seed companies that are initiated in post-conflict settings or fragile states rely on emergency aid to get established and expand their businesses.

However, it tends to be the larger companies and multinational companies that have benefitted most from seed sales for relief and subsidy programs. In Malawi, for example, the number of seed companies increased from five in 2005 to 24 in 2020, but 87% of maize seed for the subsidy program is supplied by just three large, multinational companies (Chirwa and Dorward, 2013). Bigger companies tend to be able to respond faster to government or aid agency seed requests and to supply the quantities required (usually greater than 500 MT). They are also better able to deal with late payments, and the late and often erratic planning processes that are common with large-scale subsidy schemes. Smaller seed companies simply cannot compete. In cases where smaller, national companies have got involved in government contracts, some have been crippled by late payments.

4. Impacts on seed supply

The dependence by seed companies on institutional purchases for subsidies or emergency distribution leads to volatility in seed production. In Mozambique, for example, SEMOC's annual seed sales increased to approximately 14,000 MT in 1993 and then decreased to just 3,000 MT in 1997 when the Emergency Seed Program phased out (Howard et al, 2001). This volatility doesn't just affect individual companies, it affects the formal seed sector as a whole. In Uganda in 2015, up to 70% of all certified seed available from the formal seed sector (approx. 16,000 MT) was distributed for free through the national subsidy scheme, Operation Wealth Creation. When the scheme started winding down and the government reduced its seed purchases, this led to a drop in formal sector seed production from 22,000 MT in 2017 to 6,000 MT in 2018.

Subsidy schemes and emergency interventions can also scale up with very little warning in response to new funding channels (for subsidy schemes) and sudden-onset emergencies such as Cyclone Idai in Mozambique in 2019. In these circumstances, some of the larger seed companies divert their efforts towards big government or aid agency contracts, interrupting the normal seed supply chain for new varieties, and creating long-lasting ripple effects. This has knock-on effects on other seed companies that are not involved in supplying seed to subsidy and emergency programs by tapping in to precious reserves of early generation seed which are always in short supply, even without free seed schemes.

Such rapid scaling-up of free seed interventions also has negative effects on the market relationships that are built up over time between farmers and seed retailers as part of long-term seed market development efforts; the trust and confidence that take years to develop can be wiped out very quickly if these retailers are unable to supply seed to meet farmers' requirements due to the diversion of seed to emergency relief programs (see Annex 3).

5. Impacts on seed retail networks and last-mile delivery

There is often little incentive for seed companies to develop agrodealer networks or the retail and marketing strategies required to sell seed to farmers if they can sell the majority of their seed to institutional buyers for subsidy and relief programs. In Malawi, in 2016, the level of reliance on the input subsidy programs accounted for between 50% and 70% of the income of participating seed companies and agrodealers (Audet-Bélanger *et al*, 2016). These seed sales are largely driven by the subsidy program, not by farmers' demand or preferences. Retail networks linked to institutional buyers lack alignment with customer satisfaction, repeat business, or farmer perceptions of value.

There is evidence from Malawi (Kelly *et al*, 2010) and Mozambique (Arezeni *et al*, 2020; Santacroce, 2019) to suggest that the shift to voucher-based distribution can increase agrodealer retail networks, but whether these lead to sustainable improvements in last-mile delivery have yet to be seen. In Mozambique, an impact evaluation of FAO's e-voucher program found that customer loyalty had increased, as evidenced by the observation that farmers were more likely to visit the same agrodealer in the subsequent season, despite the discontinuation of the voucher program (Santacroce, 2019). Research undertaken in Kenya questioned whether the agrodealer model offers the best approach for delivering improved seeds to smallholder farmers, and proposed alternative models, e.g. mobile agrodealers; businesses that combine non-agricultural products or services with agricultural inputs; or the establishment of group-based agrodealerships, e.g. for farmers' organizations, women's groups or youth groups, which might operate part-time or on a not-for-profit basis as a service to their communities (Odamé and Muange, 2011).

6. Impacts on seed quality

The problem of so-called "fake seed" in Uganda reportedly originated with the emergency seed aid programs that began in the late 1980s for internally displaced people in Northern Uganda (Longley *et al*, 2021). At that time, the formal seed sector was still very young; emergency seed aid was poorly regulated and highly politicized; and the speed of delivery was emphasized over the quality of seed. This has had long-term negative impacts on both the development of commercial seed systems in Uganda and on emergency seed aid programming at a regional level⁵. These experiences contributed to the current emphasis on seed quality within emergency seed provisioning. Seed programs continue to be very lucrative for the suppliers, and there will always be less scrupulous companies involved, necessitating proper quality controls within the seed sector in general and for direct seed distribution in particular.

In Malawi, over the many years of subsidy programs, there has been an increase in the number of (para-) seed inspectors trained by government, and also a proposal to accredit licensed private seed inspectors, but certification and quality control are still considered to be weak (Audet-Bélanger *et al*, 2016). The supply of seed for subsidy programs is highly political, and companies with political connections tend to capture the largest share of subsidy volume, even though their varieties may not necessarily be appropriate for the farmers and their seed quality may not be the best.

7. Farmer demand for improved varieties and crowding out

In relation to the demand for improved varieties by farmers, poor quality seed of inappropriate varieties does little to create demand among farmers, and neither does the limited range of crops and varieties that tend to be provided through subsidies and emergency seed provisioning. Theoretically,

⁵ Seed from Uganda is also used to supply emergency interventions in South Sudan, DRC, Rwanda and Burundi.

this could be addressed by vouchers or e-vouchers, allowing farmers to select seeds of their choice from selected agrodealers. But there are still concerns that subsidies crowd out commercial seed purchases by smallholder farmers. A study in Malawi, for example, showed that the targeting of subsidized input distribution favors larger farmers who are also those who would be expected to purchase inputs on the market (Mason and Ricker-Gilbert, 2012). The same study also found that each one kg increase in subsidized seed acquired by a smallholder farmer reduces commercial improved maize seed purchased by 0.56 kg (compared to 0.22 kg for fertilizer). In Mozambique, a detailed study of the impacts of the 2009-11 pilot subsidy program found no lasting impacts on the use of improved seeds in the post-voucher period (Carter *et al*, 2014).

8. Innovative approaches: Building resilience among farmers and seed systems

Emergency seed provisioning is most often provided in response to recurrent or on-going crises rather than one-off shocks. In such situations, a longer-term approach is seen to be more appropriate than repeated emergency interventions. Such an approach forms the basis of the Kenya Cereal Enhancement Program – Climate Resilient Agricultural Livelihoods program (KCEP-CRAL) and the Innovation for Agribusiness project (InovAgro) in Mozambique, as described below.

KCEP-CRAL (2015-22)⁶ is being implemented in the disaster-prone districts of Kenya's arid and semi-arid lands. The seed-related components of the KCEP-CRAL program emphasize crop diversification and climate resilient varieties, along with a value chain approach and training in agronomic practices and financial literacy, to encourage the adoption of new, appropriate varieties. Seed is provided through e-vouchers and private sector agrodealers. Seed demand by the project is more predictable on account of the longer-term approach (seven years). The use of e-vouchers allows for a sliding subsidy value, which - theoretically - avoids the problem of crowding out.

In Mozambique, the InovAgro project (2011-21) emerged out of the realization that repeated free seed distribution through emergency responses was not only inappropriate to the recurring nature of emergencies but also damaging to formal seed system development. InovAgro⁷ was planned as a long-term (ten-year) project to develop inclusive, commercial, market-driven systems for agricultural input supply for smallholder farmers. Its approach was informed by the distortionary market effects of earlier free seed programs and the lack of awareness among farmers about the value of certified seed (Ribeiro, 2020).

Both of these projects promoted improved varieties from the formal seed sector, and this was done in ways that prioritized diversification, appropriate varieties, farmer awareness, and market-driven systems. Promoting improved varieties among smallholder farmers necessarily takes time and cannot be achieved through short-term emergency interventions. Yet when seed is provided for free, farmers are unlikely to purchase seed, making it very difficult to create demand-led last-mile delivery solutions. In Mozambique, for example, the Cyclone Idai response of 2019/20 threatened to wipe out InovAgro's years of progress in building seed markets by diverting large quantities of seed away from smallholder markets and into the emergency response (Ghebru and Smart, 2019; DAI, 2019). Such challenges are common in humanitarian-development nexus contexts (e.g. in fragile states, post-conflict situations, situations of forced displacement, and in response to climate change), where

⁶ See <https://www.ifad.org/en/web/operations/-/project/1100001651>

⁷ See <https://www.dai.com/our-work/projects/mozambique-innovation-agribusiness-inovagro>

development programming and emergency programming are both required at the same time. Nexus programming⁸ requires enhanced coherence between emergency and development efforts. For resilience building and seed sector development to be successful, new ways of emergency seed provisioning are urgently needed, as proposed below.

9. Recommendations

9.1 Building resilient farming and seed systems

Where there are recurrent emergencies, these emergency seed interventions need to be replaced with long-term, resilience-oriented programming, as in the Kenya case described above. Such interventions must invest in training and awareness-raising so that farmers have the knowledge about quality seed and improved varieties to decide whether or not to purchase these inputs. At a broader level, effective seed quality assurance (including farmer feedback loops) is needed in the formal seed sector to protect the value of the farmers' investments when they purchase seed – such efforts are already happening, but there are many challenges, not least from ongoing subsidy and emergency seed interventions. Rather than only subsidizing the demand side, governments and donors could focus more on supporting the supply side through public-private partnerships, and by providing investment credits or subsidized loans to seed companies so that they can lower their costs and reduce their risks (as in India). Such steps can potentially enhance the resilience of the formal seed sector.

9.2 Cash Transfers for Food Security and Livelihoods in Emergencies

The recommendations above are not new. In the event of a crisis, however, we propose that cash rather than vouchers or seed is provided prior to planting time to restore livelihoods and food security. Cash transfers for seed security have been shown to offer flexible market-led interventions to support farmers' access to seed in any emergency context, provided that good quality seed is locally available through either the formal or informal seed system (Keane et al, 2019; Longley et al, 2023 forthcoming). Numerous studies have shown that seed is usually available following a crisis, especially in the informal sector (e.g. McGuire and Sperling, 2016).⁹

Cash allows farmers to choose whether to invest in seed and/or other items, according to their own priorities. If they choose to purchase seed, then they can also choose which crops and varieties they prefer, and whether to purchase from the formal or informal seed sector markets. Where formal sector seed is available, cash can support formal sector seed markets. A major challenge for decision-makers in the emergency seed sector to shift to cash programming is in giving the decision-making power to farmers and trusting farmers to make the 'right' decisions.

9.3 Enhancing the quality of informal sector seed provided by informal traders

Within the informal seed sector, farmer-saved seed has been shown to be of good quality, but there is a need to enhance the quality of seed available in local markets. This brief is not proposing the

⁸ This relates to the humanitarian-development nexus, or the humanitarian-development-peace nexus. Such programming typically involves the creation of synergies and common goals across short-term emergency response programs and longer-term development processes that effectively meet peoples' needs, mitigate risks and vulnerabilities, and move toward sustainable peace.

⁹ Quantitative data from particularly stressed contexts in six countries shows that as much as 90% of seed that is normally planted by smallholder farmers comes from the informal seed sector. This finding is drawn from seed system security assessments conducted in Malawi, Kenya, DRC, Haiti, South Sudan, and Zimbabwe, providing a uniquely comprehensive data set that includes 9660 observations across 40 crops. Other studies provide similar results, e.g. Longley et al, 2001.

formalization of the informal seed sector by imposing certification standards, but simply the distinction of grain and seed by informal traders. This involves creating awareness among informal traders about how to determine which types of seed (i.e. which crops and varieties) are most in demand by farmers, how to identify farmers from whom to purchase seed, how to manage and store distinct varieties of seed, how to market informal sector seed, and how to calculate the price differential between seed and grain. Much can be learned from informal traders who already make these distinctions, as in Somalia, the Sahel, Bolivia, and Mexico (Longley *et al*, 2001; Lipper *et al*, 2009) and from existing studies of informal seed markets for particular crops, e.g. yellow bean in East Africa (Birachi *et al* 2020) Working with informal traders to enhance seed quality can be incorporated into longer-term resilience programs in areas with recurrent emergencies.

Annexes

Annex 1. Free seed and subsidies in Malawi

Thirty years of subsidy programs: Changes in objectives and modalities

Malawi has had a series of large-scale agricultural inputs distribution programs since 1992. There have been a number of transformations over the years, not only in terms of the objectives of the programs, but also in scale and delivery modalities, as summarized in Table 1.

The initial intervention of 1992-93 was designed to provide agricultural inputs to farmers affected by drought; whereas the Starter Pack Scheme of 1998-2000 was designed to allow farmers to test improved seed varieties and fertilizer for themselves (Longley *et al*, 1999; Harrigan, 2008). The aims of subsequent inputs programs changed from social protection and food security for vulnerable households to national food production and self-sufficiency (Daidone *et al*, 2017). The aim of the Agricultural Input Subsidy Program (AISP), for example, was to increase resource poor smallholder farmers' access to improved agricultural inputs in order to achieve food self sufficiency and to increase resource poor smallholder farmers' incomes through increased food and cash crop production (Dorward and Chirwa, 2011).

A secondary objective of the AISP was to build a reliable input distribution system with an appropriate mix of government and private sector services (Kelly *et al*, 2010). Some researchers, however, argue that the input programs have created a seed industry dominated by multinational seed companies that offer farmers a narrow range of products that do not necessarily benefit smallholders increasingly affected by the impacts of climate change (Chinsinga, 2010; Sutcliffe, 2014).

The quantities of seed and the number of beneficiaries have varied over the years – roughly between 4,000 and 10,000 MT – but the latest program (2020/21) is the biggest yet, with over 21,000 MT of seed for 4.3 million farmers. Whilst seed was provided with a 100% subsidy up to 2020¹⁰, the 2020/21 program involves a financial contribution from farmers. In terms of seed supply modalities, a major shift occurred in 2005/6, since when seeds have been supplied through the private sector rather than through the government. Vouchers have been used since 2002, but it was only in 2007/8 that flexible vouchers were introduced, allowing farmers to choose their preferred crops (Kelly *et al*, 2010).

¹⁰ In 2007/8, retailers were authorized to request a cash “top-up” not to exceed 90 MK/voucher for hybrid seed voucher redemption, but this system was poorly publicized and led to confusion and resentment among farmers and unwarranted accusations of illegal practices by seed suppliers (Kelly *et al*, 2010).

Table 1. Malawi seed distributions & subsidies

Year	Program	% subsidy for seed	Maize seed provided (MT / year)	Modalities	Average number of beneficiaries
1992-1993	Drought Recovery Inputs Project	100%	NA	Direct distribution	1.3 million
1994-1996	Supplementary Inputs Project	100%	NA	Direct distribution	730,000
1998-2000	Starter Pack Scheme	100%	NA	Direct distribution	2.8 million
2000-2002	Targeted Input Program	100%	NA	Direct distribution	1.25 million
2002-2004	Extended Targeted Input Program	100%	3,700	Vouchers redeemed at government depots	2.25 million
2004/2006	Extended Targeted Input Program	100%	10,000	Vouchers redeemed at government depots	NA
2006-2009	Agricultural Input Subsidy Program	100%	5,100	Vouchers redeemed through private sector	NA
2009/2010	Agricultural Input Subsidy Program	100%	8,700	As above	NA
2010/2011	Farm Input Subsidy Scheme	100%	10,700	As above	1.6 million
2011-2016	TBC	TBC	TBC	TBC	TBC
2016-2020	Farm Input Subsidy Program	70% for maize 100% for legumes	5,000	Vouchers redeemed through private sector, with “top up” paid by farmer for cost of maize	900,000
2020/21	Affordable Inputs Program	partial	21,400	TBC	4.3 million

Compiled by the author from various sources.

TBC=To be confirmed. NA=Not available.

A vast number of studies and evaluations have been undertaken on Malawi’s various subsidies schemes over the years, but relatively few reports look at the impacts on the formal seed sector. At the global level, there is more literature on the impacts of agricultural inputs subsidies on the fertilizer sector than on the seed sector.

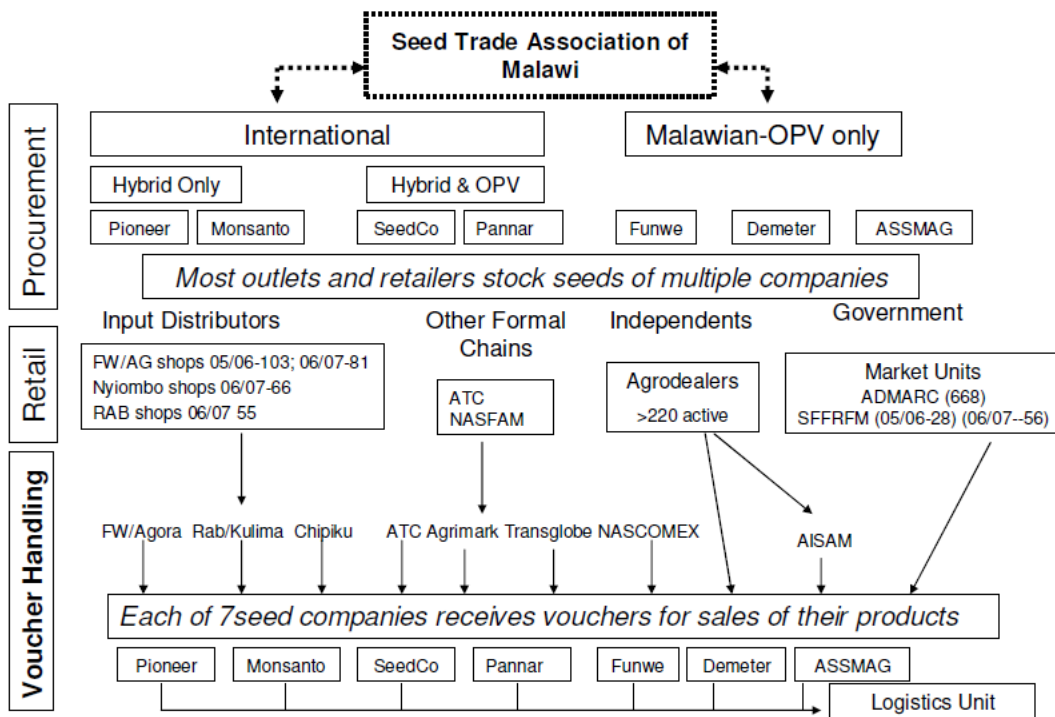
Structure of the Malawi seed industry

Structural adjustment programs of the late 1980's and early 1990's led to the complete liberalization of the seed industry, including the removal of controls relating to seed multiplication and distribution, the restriction of public agricultural research and seed line development, and limitations to the state's regulatory capacity (Chinsinga, 2010). There are both international and local players in the seed industry (Figure 1), with the large multinationals controlling much of the market. In 2006/7, the players in the seed industry constituted themselves into the Seed Traders Association of Malawi (STAM) which aims to improve professionalism in the sector and enhance seed quality among its members. Only STAM accredited seed suppliers can participate in the input support programs. STAM engages in policy discussions with the government, including decision-making relating to the input support programs (Chinsinga, 2010; Kelly *et al*, 2010).

At the retail level, seed is provided through independent agrodealers and distributors, as well as government-run outlets (Figure 1). Many of the agrodealer networks have been supported by donor-funded projects created to build a more vibrant private sector supply system. Government-run outlets offer sales points in areas that are not served adequately by the private sector (Kelly *et al*, 2010). An interesting feature of the seed sector in Malawi that emerged out of the high level of paperwork needed for voucher redemption is the role of the Agricultural Input Suppliers Association of Malawi (AISAM)¹¹ which set itself up as an intermediary between the seed companies and a large number of agro-dealers who wanted to sell voucher seed 2006/7 (Kelly *et al*, 2010). AISAM ran into cash-flow problems in 2007/08 and substantially reduced its support to agrodealers in 2008/09, concentrating on one small geographic area and dealing exclusively with one seed supplier (*ibid*). AISAM has since become a registered legume seed producer.

¹¹ AISAM was originally established by donor-funded projects as a network of agrodealers that aimed to build a more vibrant private sector supply system (Kelly *et al*, 2010).

Figure 1. Structure of the Malawi Seed Industry



Source: Kelly *et al*, 2010.

Impacts of the subsidy programs on seed companies

The 2005/6 shift from government distribution to private sector distribution is linked with an increase in the number of seed companies in Malawi, which increased from 5 in 2005 to 24 in 2019 (Mabaya *et al*, 2020). Although both AISP and FISP led to the establishment of many local seed companies (Audet-Bélanger *et al*, 2016; Kelly *et al*, 2010), 87% of maize seed is supplied by just three large, multinational companies (Chinsinga, 2010; Chirwa and Dorward, 2013). Political economy analysis suggests that the subsidy programs, combined with earlier market liberalization, have benefitted multinational seed companies over local seed companies, and developed the maize sector at the expense of other crops (Chinsinga, 2010). Evaluations show that the introduction of the flexi-voucher in 2007/8 stimulated some interest in the development of seed supply for alternative crops, including new seed firms for legumes, but most flexi-vouchers were used for maize (Kelly *et al*, 2010).

The companies supplying seed to the subsidy programs have been negatively affected by the late settlement of bills by Government (SSTP and Rutgers University, 2016). Late planning and slow payments are common with government schemes in many African countries and tend to affect smaller companies more than larger companies. Larger companies and multinational companies are generally better able to deal with late payments. Bigger companies are also more agile and able to respond faster to government requests that might be announced late in the season. Some seed companies choose not to get involved with subsidy programs at all due to government planning and payment systems.

Available data up to 2019/20 showed that the subsidy program was still the main buyer of seed for about half of the seed companies, and a significant number of companies relied on the program for

up to 50-60% of their revenue, despite fluctuations from year to year (Audet-Bélanger *et al*, 2016; Mabaya *et al*, 2020). Another study (Kelly *et al*, 2010) suggested similar levels of dependency by the seed industry on the AISP subsidy program, as illustrated by this rough overview and future scenario provided by a seed company representative:

- 4.5 thousand tons of improved seed sold before vouchers
- 9-10,000 tons sold now
- Withdraw seed subsidy and sales will drop to about 6.5 thousand tons
- Withdraw fertilizer subsidy and sales will drop to 5,000 tons (very small increase over pre-subsidy level of 4.5 thousand tons)¹².

Such a scenario (which was thought to be entirely plausible by the researchers) suggested that the subsidies have increased the demand for quality seed of improved varieties, but that this is highly dependent on continued subsidized access to fertilizer.

Impacts of the subsidy programs on retail distribution networks

Overall, the subsidies stimulated private sector investment in retailing, leading to an increase in the number of agrodealers, closer to farmers in some areas. A longitudinal survey conducted in 2007 and 2009 among all types of retailer found that the greatest single year of growth was 2006 (the first year of the input voucher program that allowed private sector participation): 35% of agrodealer, 33% of distributor, and 27% of outlets owned by the Agricultural Development and Marketing Corporation (ADMARC) opened during the period 2006 through 2008 with 50% or more of the new openings in each category taking place during the 2006 season. (Kelly *et al*, 2010). Data from farmers, however, regarding the input supply available to the surveyed communities between 2006 and 2007/08, revealed little or no change in the number of nearby hybrid maize seed sellers, with significant regional variations (*ibid.*)

The AISP specifically encouraged the expansion of private sector involvement in more remote rural areas by paying a “remoteness” premium¹³ allowing some private seed companies and distributors to set up temporary distribution points and/or agreements with independent agrodealers who acted as agents for the distributor (*ibid.*). However, there is no evidence that this program led to any permanent changes in the structure of the distribution networks in the more remote areas (*ibid.*). Agro-dealers interviewed for one study reported that FISP accounted for 60-70% of their seed sales income (Audet-Bélanger *et al*, 2016). Whilst agro-dealers benefited from an increase in sales as a result of the subsidies, in some cases the voucher sales simply displaced commercial sales rather than adding to them (Dorward and Chirwa, 2011; Kelly *et al*, 2010; see below). In the longer term, retail outlets appear to have benefited from indirect gains in seed sales generated by the general increases in demand generated by wider income growth and easing of liquidity constraints from one season to another (Dorward and Chirwa, 2011).

“Crowding out” or displacement of commercial sales

Displacement of commercial sales occurs where a farmer reduces his or her unsubsidized or commercial input purchases as a result of being able to buy the same or a similar input under the

¹² The one caveat concerning the removal of fertilizer subsidies was that rising maize prices may encourage more maize production and use of hybrids even without the fertilizer subsidy.

¹³ For selected Extension Planning Areas (EPAs), the Government paid an incentive bonus for fertilizer vouchers surrendered from these EPAs (Kelly *et al*, 2010).

subsidy program (Dorward and Chirwa, 2011). This is also referred to as “crowding out” commercial purchases. Unlike universal input subsidies, targeted input subsidies should not – in theory – displace input purchases because they target people who would not otherwise purchase inputs (Mason and Ricker-Gilbert, 2012). This is not the case in Malawi, however, where several studies have shown that the subsidies crowded out commercial maize seed purchases by smallholder farmers (Mason and Ricker-Gilbert, 2012; Chirwa and Dorward, 2013; Holden, 2013; Kelly *et al*, 2010).

Targeting processes in Malawi have been shown to favor larger farmers who would otherwise buy the inputs at market prices: each one kg increase in subsidized seed acquired by the household reduces commercial improved maize seed purchases by 0.56 kg (Mason and Ricker-Gilbert, 2012). In other words, for each metric ton of subsidized seed distributed by the government, total improved maize seed usage increases by only 0.44 MT (*ibid.*). This effect is confirmed by Chirwa and Dorward (2013) who analyzed data on commercial purchases of OPV and hybrid maize seeds as compared to subsidized purchases in the period 2008/09 to 2010/11. They concluded that the subsidy program was to some extent crowding out commercial purchases, although the overall use of improved seeds has been increasing. Model simulations undertaken by Holden (2013) similarly demonstrated a high risk of crowding out and that the effect is very sensitive to household characteristics, market characteristics and relative prices. Data collected by Kelly *et al* (2010) based on interviews with seed industry professionals also pointed to the displacement of commercial seed sales.

Impacts of the subsidy programs on “professionalism” in the seed sector

The growth and performance of the professional association can be taken as an indicator of professionalism in the sector. The Seed Trade Association of Malawi (STAM) was established in 2004 and, as of 2019, had a membership of 24 seed companies (Mabaya *et al*, 2020). Most signs indicate that it is functioning well, and it had some early successes in dealing with seed quality and classification issues in relation to the subsidy programs (Kelly *et al*, 2010). A survey among STAM members undertaken in 2019 by The African Seed Access Index (TASAI) gave a “good” rating in every indicator (between 70% and 79%) apart from “democracy in elections,” which was rated “excellent” (84%) (Mabaya *et al*, 2020). STAM has been actively engaged with the Government of Malawi in decision-making regarding the subsidy programs.

A second indicator of the growth of professionalism is related to problems encountered by the AISAM agrodealer network and the manner in which they are being resolved both through the legal system and through efforts by seed sector actors (Kelly *et al*, 2010).

Conclusions

On the surface, it appears that there has been some development in the private sector. The number of seed companies and the number of agrodealers have increased. However, there are serious inequalities in the terms of the market share held by different types of company and different crops, and there appears to be a high level of dependence on the subsidies for seed sales. Political economy analysis suggests that multinational seed companies have benefitted over local seed companies, and that the maize sector has developed at the expense of other crops (Chisinga, 2010). It has been argued that the emphasis on maize has affected the breeding programs for improved varieties, neglecting the other grain crops (*ibid.*).

Chirwa and Dorward (2013) concluded that although the subsidy has had some negative impacts on private sector development in the form of displacement in the short run, in the medium to long term it appeared to have been catalytic in raising the demand for both fertilizers and improved seeds. Kelly *et al* (2010) further noted that the high level of policy uncertainty associated with year-to-year changes in the way that private sector input suppliers were allowed to contribute to the overall subsidy effort did not put the program in the position of a potential role model when it comes to building private sector capacity capable of providing reliable, long term input supply to all farmers.

Annex 2: Free and subsidized seed distribution in Uganda¹⁴

Historical background: The relief seed business and the emergence of the seed industry

Free seed distribution through emergency programs has historically shaped the Ugandan seed sector. Large scale distributions of free seed began in the late 1980s, at a time when Uganda was recovering from a protracted period of unrest and when the seed industry was relatively small. Large quantities of seed were procured by humanitarian agencies for distribution among 1.5 million internally displaced people (IDPs), particularly in the Acholi and Lango sub regions of northern Uganda. The fledgling seed industry was unable to meet the scale of the demand, seed quality was poorly regulated, particularly given the urgency with which seed needed to be procured, and government allowed ordinary trading companies to supplement the efforts of the seed companies, especially for the crops the formal seed companies were not able to supply. The involvement of trading companies in the relief seed business is widely thought to be the origin of poor quality, counterfeit or fake seed.

Current quantities of seed aid

Today, emergency seed aid continues to target refugee and host communities in the north-west and western regions in Uganda and areas that are affected by flood and/or drought. Obtaining accurate data on the quantities of seed distributed through emergency programs is difficult, and several large agencies are unwilling to share their data on seed distributions. It is estimated that approximately 4,000 - 5,000 MT of seed are distributed in Uganda annually through emergency programs, though one government official suggested that the figure could be as much as three times higher, up to 15,000 MT (including vegetative planting material) or 10,000 MT (excluding vegetative material).

Uganda is also the epicenter of humanitarian support for many of the surrounding countries including South Sudan, DRC and Burundi. Seed has been exported from Uganda for emergency interventions in South Sudan (formerly Southern Sudan) since at least the early 1990s, and it has been reported that one, if not two, of the current Ugandan seed companies were originally established to meet the demand for seed in Southern Sudan. Official figures for 2019 show that 2,869.9 MT of maize seed (hybrids and OPVs) was exported, mainly for emergency seed distributions in South Sudan, DRC and Burundi, and that this accounted for 20% of Uganda's total maize seed production for that year.

Large-scale government subsidy schemes

Operation Wealth Creation (OWC, 2014 – to-date) was designed to support smallholder farmers to participate in commercial agricultural production (with an associated reduction of subsistence farming) through community mobilization, equitable and timely distribution of inputs and facilitation of agricultural production chains. In 2015, the National Agricultural Research Organization (NARO) estimated that 50% to 70% of all certified seed available for sale (approx. 11,500-16,000 MT) was distributed for free through OWC. Seed was bought by the National Agriculture Advisory Services (NAADS) from prequalified registered seed companies, and distributed to farmers by the military. Agrodealers were bypassed. Several private businesses used to get tenders but outsourced the same to formally registered seed companies; this was subsequently discouraged.

OWC has been winding down in recent years, and this appears to have had a major effect on commercial sales and production. This is not surprising, given the high proportion of formal sector

¹⁴ Much of the material in this annex has been taken from Longley *et al*, 2021.

seed production that was being procured for OWC. The reduction in OWC seed purchases led to a drop in formal sector seed production from 22,000 MT in 2017 to 6,000 MT in 2018. The winding down of OWC also appears to coincide with a significant increase in seed distributed in South Sudan. Much of the seed distributed in South Sudan is imported from Uganda, and the majority of Uganda's seed exports go to South Sudan.

The replacement of OWC with the Agricultural Cluster Development Project (ACDP) suggests that the government is now shifting away from direct distribution of free seed towards more commercially oriented, though subsidized sales of seed through agrodealers.

The Agricultural Cluster Development Project (ACDP) is a 7-year subsidy program funded by the World Bank that began in 2018 with an initial 90,000 smallholder farmers. The e-voucher system was officially launched in the first season of 2020 starting with 56,000-acres from 56 districts¹⁵ (an average of 1,000 acres /households per district). During the first season of the farmers' engagement with the project, an eligible farmer is subsidized by 67% of the cost of farm inputs, during the second year/season the same farmer will be subsidized at 50% and in the third cycle will be subsidized at 15%. To be eligible for the e-voucher subsidy program, the farmer must be a member of a registered farmer group; should be able to commit at least one acre of land; and be willing to co-fund for the inputs as per established model i.e., 33%, 50% and 85% during the 1st, 2nd, and 3rd cycles respectively. The package of inputs supplied by the program include improved seeds, fertilizers, herbicides and fungicides depending on the farmers' needs, tarpaulins for drying the harvest as well as bags for safe packing and storage. ACDP began piloting an e-voucher system in 2020 with 29 agrodealers.

Relief seed procurement policy and the challenge of 'fake' seed in Uganda

FAO and some of the larger NGOs engaged in direct seed distribution for emergency or relief purposes have, over time, developed procurement protocols which require that they buy the best seed that is available on the market to ensure high germination and production for farming communities that are in food insecure zones. This requirement has led many organizations to follow internal compliance regulations to buy certified seed for distribution to project participants and refugees. This drives a zero sum game, in the sense that irregular and unplanned buying of certified seed for humanitarian needs removes seed from the market that was destined for commercial farmers. It is this vacuum that can be replaced with low quality seed.

The high level of free and subsidized seed distribution by the government and humanitarian organizations, possibly accounting for as much as one-quarter of total certified seed production, represents a significant level of seed demand, and there is concern that the vacuum created by a sudden and irregular purchase of certified seed, acts as a driver in pushing up the levels of counterfeit (fake) seed in the market.

The use of Quality Declared Seed (QDS) in seed aid interventions

The national seed policy was changed in 2014 to allow the production of Quality Declared Seed (QDS), a less stringent seed class than certified seed. QDS was developed as a means of attracting new business entrants into the seed market, as it provides a means for selling quality seed of improved varieties, at a lower cost than certified seed and makes seed available in locations that are

¹⁵ Uganda currently has 135 districts in total.

beyond the formal seed market frontier. This has led to several efforts from the development community to establish farmer seed producer groups – known as Local Seed Businesses (LSBs) - to grow and sell QDS seed for potato, beans, soybean, rice and groundnut. Commercial seed companies are not allowed to produce QDS, which offers a market opportunity for LSBs.

Typically, QDS is produced through semi-commercial methods, most commonly with technical and financial support from publicly-funded projects. QDS is being used by some projects to promote sales of quality seed in geographies that are not yet served by commercial seed companies. Whilst this approach has been successful in its institutionalization (Mastenbroek et al, 2021) and within the project context, volumes of QDS seed remain relatively low, ranging from approximately 2,000 – 4,000 MT annually in recent years for all crops, varying according to specific projects for specific crops such as beans and rice. There is little evidence of QDS production being sustainable on a commercial basis, due to weak links to foundation seed and lack of commercial capacity within farmer groups.

QDS also has a role in emergency seed provisioning. Donor-funded seed fairs in emergency contexts can sometimes provide a sales outlet for LSBs, particularly if beneficiary farmers are provided with vouchers with which they can purchase seed. The Integrated Seed and Sector Development Uganda program and other NGOs, on the other hand, have established LSBs among refugee and host communities in West Nile Region and elsewhere, creating new intermediate seed systems at the local level.

In addition to these types of linkage arrangements that allow LSBs themselves to sell QDS directly to farmers participating in local emergency interventions, it is known that both NGO and private companies will sometimes procure QDS from LSBs that is then distributed / sold to emergency interventions in neighboring districts. This is not in line with intended QDS distribution modalities.

Annex 3. A short history of subsidies and emergency seed aid in Mozambique (1988-2021) with lessons from recent experience

1988-2001: Programa de Emergencia para Sementes e Utencilios (PESU) and free seed kits
Seeds and tools distribution officially started in 1988 with the creation of the donor-funded Emergency Program for Seeds and Tools (PESU – Programa de Emergencia para Sementes e Utencilios). In the early 1990s, up to 1.2 million small-scale farming families affected by drought and civil war received seeds and tools annually from PESU to help them to re-establish their agricultural activities (Howard et al 2001). Seeds were imported from neighboring countries (mainly from Seed Co, Zimbabwe) due to the low capacity of seed production of the National Seed Company (ENS – Empresa Nacional de Sementes).

At the same time (1988), the Nordic countries also supported the development of the formal seed sector: SEMOC (Sementes de Mocambique lda) was established within the existing National Seed Company, as the sole formal sector seed company responsible for the production of all seed required in the country; and the National Seed Service (SNS – Servico Nacional de Sementes) was established as the organization mandated to control seed quality.

Both PESU and international NGOs provided seed in pre-prepared kits containing seeds of different crops (maize, cowpea, groundnuts, beans and vegetables) and tools specific to different zones. SEMOC grew rapidly to take the leadership of this business, and almost all of SEMOC's sales - about 90% - was sold to the emergency programs (Howard et al. 2001). Most of SEMOC's seed was imported from neighboring countries, with some local production. SEMOC's annual seed sales steadily increased up to about 14,000 tons in 1993 and then steadily decreased to about 3,000 tons in 1997 when PESU phased out. These figures vividly illustrate the degree to which the establishment and evolution of SEMOC was dependent on the emergency response programs.

After 1996-7, the Nordic assistance to SEMOC and SNS phased out, and SEMOC was bought by Seed-Co. (Zimbabwe). SEMOC remained dependent on tendered seed kit contracts with NGOs and FAO for emergency seed distribution until at least 2001 and the introduction of input trade fairs (ITFs) and vouchers.

2001-2006: Input trade fairs (ITFs) and vouchers

By 2001, after 12 years of seed kits distribution, those involved in emergency seed provisioning were ready to try a new approach. There was a widely shared sense of frustration over the fact that the delivery of seed kits to farmers was always late, and that the types of seeds being distributed were not necessarily appropriate for all parts of the country (Longley *et al*, 2005).

Following the devastating floods of 2000 and the subsequent widely publicized funding appeal for seeds and tools, concerned stakeholders – including those who had been involved in the earlier seed distributions– published an open letter in an attempt to dissuade relief and humanitarian agencies against the delivery of seed of inappropriate crops and varieties (*ibid.*). Despite the letter's plea, the same seed kit approach was used in the FAO-led response. Seed was procured from multiple sources at short notice and inevitably some of the seeds were of low quality (especially maize and cowpea) and were not appropriate to local growing conditions (World Bank 2003).

With technical support from the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), FAO implemented the first pilot seed fairs in the districts of Maringue (Sofala province) and Macossa (Manica province) in 2001 (Longley *et al.*, 2005). The approach was seen to be successful, and it was subsequently replicated by the government in Maputo Province. After these experiences, the Ministry of Agriculture recognized the ITF/voucher system as the preferred mechanism for assisting farmers affected by disaster in Mozambique. This public endorsement by the Ministry, combined with the failures of the earlier seed kits, prompted a rapid shift from seed kits to ITFs and vouchers.

From 2002 to 2006, ITFs and vouchers were the preferred mechanism for responding to emergency needs within the agricultural sector. At the early fairs, farmer participants were given a voucher worth about \$8 without any contribution from the farmer, but a farmer contribution of approximately 10% was then introduced to encourage farmers to spend the voucher more wisely. After 2006, it was recognized that repeated emergency ITF/voucher interventions were not adequately addressing the underlying chronic problems inherent in the agricultural sector. It was also apparent that seed companies and their agents were increasingly influencing the design and implementation of ITFs so as to favor the formal seed sector (e.g. by controlling prices, restricting the participation of non-local traders, and the introduction of new requirements for the registration of vendors). Vendors at the early fairs (implemented both by govt, FAO and by various NGOs) were a combination of farmers selling their own seed, grain traders, and seed companies. Over time, however, this shifted, and the seed fairs increasingly focused on formal sector, certified seed.

2009-2015: Subsidy schemes and paper vouchers

During the period 2009-15, ITFs were incorporated into a series of subsidy schemes that provided different types of seed and fertilizer ‘packs’ to different types of farmers. Input subsidy schemes in Mozambique have been described as ‘fragmented and operate more along the lines of projects and pilots’ (African Centre for Biodiversity, 2019). In a two-year pilot (2009-11), the subsidy program used a voucher system, and farmers received either a rice input pack (40 kg seed and 2 bags of fertilizer) or maize input pack (12.5 kg seed and 2 bags of fertilizer). Farmers contributed to approximately 30 percent of the total cost of the inputs.

An impact study found that the uptake and use of the voucher coupons was surprisingly low (well below 50%) among eligible farmers, and there were no lasting impacts on the use of improved seeds in the post-voucher period (unlike fertilizer). Results from randomized controlled trials showed that the subsidy led to a short-term increase in maize yields during the program and the continued use of fertilizer in the two years after the subsidy had ended. In contrast, however, the coupons were not seen to have any lasting impacts on the use of improved seeds in the post-voucher period (Carter *et al.*, 2014).

From 2013 to 2015, a similar input subsidy package was provided to 25,000 farmers in Manica, Zambezia, Nampula and Sofala provinces under the European Union funded the “Accelerate Progress Towards Millennium Development Goal 1C” (MDG1c) Program. This was implemented by the Rome-based agencies of the UN (including FAO) and coordinated by the Mozambican Technical Secretariat for Food and Nutrition Security (SETSAN). The program initially used paper vouchers and shifted to electronic in 2015/16.

2016-present: Electronic vouchers

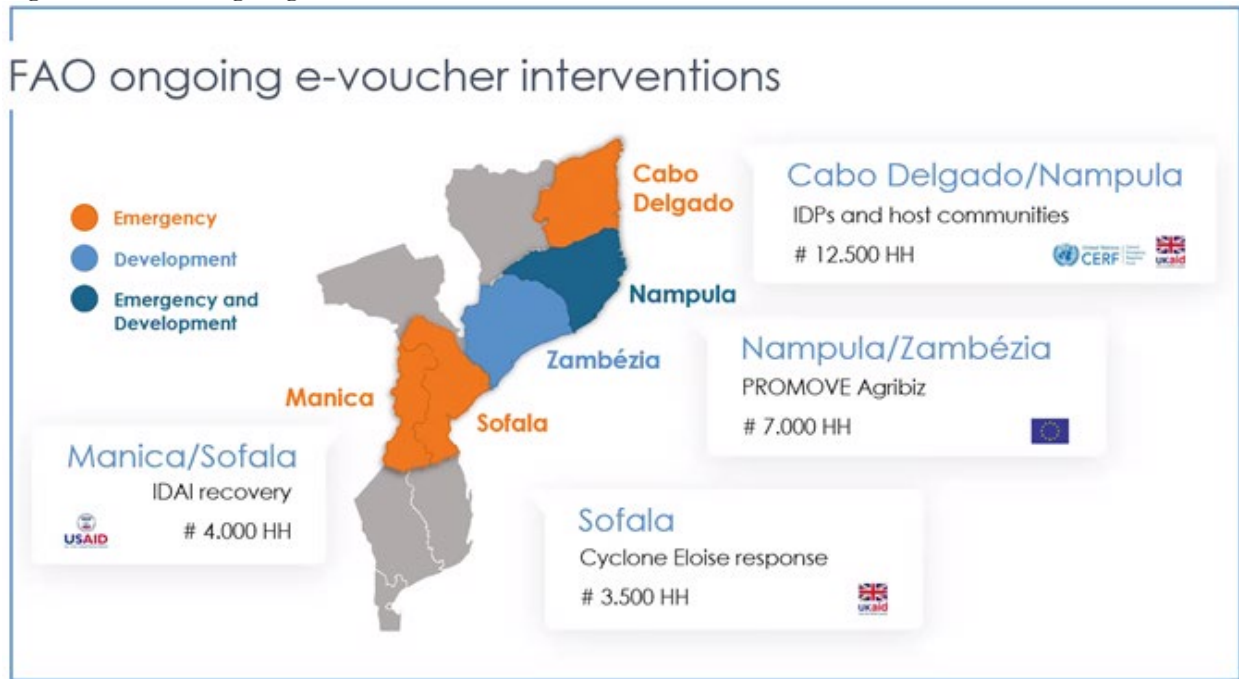
The electronic vouchers of the MDG1c Program were implemented through 25 agrodealers. Two packages were made available – Package A (worth \$35) was designed for subsistence farmers, particularly women-headed households, and Package B (worth \$130) for emerging farmers. Both packages contained a range of crops; Package B included hybrid maize and fertilizer in addition. Farmers contributed 25% towards the cost of Package A and 40% of the cost of Package B. Importantly, the farmers receiving the packages were also receiving extension advice through Farmer Field Schools.

The e-voucher evaluation presents positive findings, but the longer-term impacts have yet to be studied (Santacroce, 2019; Arzeni *et al.*, 2020). The e-voucher system is considered to have been very successful, with agrodealers reporting that the turn-over had substantially increased during the program (up to ten times) but somewhat decreased after the end of the program. Overall, the growth in volume of sales of inputs since the inception of FAO's voucher program in 2014 was found to be three to four times more. According to them, the turnover was still much higher than before as farmers still continued to purchase seeds and fertilizers with their own funds. The increased interest for agricultural inputs through the e-vouchers component incited agro-dealers to set up input shops in more remote communities who thus far were not serviced at all.

The e-voucher component thus contributed to improved service provision and private initiative of agricultural input suppliers. The e-vouchers were found to have fostered stronger and trusting relationships between agro-dealers and their trading partners (farmers and suppliers), leading to greater resilience and economic self-sufficiency of the former. The link with knowledge transfer through Farmer Field Schools reportedly made a positive contribution to agricultural productivity, though relatively few farmers benefited from the e-voucher scheme (in some Farmer Field Schools less than 30%). The required contribution was said to be a major barrier for many resource-poor farmers.

The successful introduction and operationalization of the voucher system made it possible to use the e-voucher system for emergency purposes (e.g. the Cyclone Idai response, also more recently in Cabo Delgado, Manica and Sofala – see Figure 2) and to register beneficiaries at a very short notice. This shows the relative ease of operation and robustness of the system. As such the e-voucher turned out to be a very practical modality, with costs per beneficiary being reduced as compared to the initial paper voucher and with enough flexibility to adapt the system to local conditions and needs.

Figure 2: FAO Ongoing e-voucher interventions



Source: FAO webinar, May, 2021.

Lessons from the InovAgro project (2011-21)

The SDC-funded InovAgro project (2011-21) was implemented by DAI and COWI with the aim of building a more robust agricultural market system and increasing access to high-quality seed and other inputs in northern Mozambique (Cabo Delgado, Nampula and Zambezia provinces). When the project started, certified seed was provided mainly through government and NGO subsidized programs, with very little actual direct sales from seed companies to the farmers. Though much remains to be done in terms of private seed sector development, the mid-term review (conducted in 2019) found that InovAgro had significantly accelerated the marketing and distribution of high-quality seed in northern Mozambique, citing this as the project's greatest achievement over its three phases. InovAgro's assistance to the seed companies reportedly helped them discover and develop markets, improve their distribution systems, access new basic seeds, and change their approach to marketing.

Box 2. Background to the InovAgro Project

When the InovAgro project started in 2011, very low quantities of certified seed were being sold to farmers, and most of that was to medium and large farmers. There were two reasons for this situation: (i) the post war "aid" approaches adopted by the Government of Mozambique, donors and NGOs, in order to, first, support the resettlement of large numbers of displaced rural families and, second, promote agriculture development; (ii) low demand of certified seed by smallholder farmers and lack of seed suppliers operating locally and selling directly to smallholder farmers. The case study report (2020) describes how Government procurement and the free/subsidized distribution distorted the market in several ways:

- *There was no market competition. The government purchased seeds in very large batches, usually greater than 500 mt, benefitting the few main seed companies which could meet that scale. This crowded out small private seed companies from selling to smallholder farmers through the government. There was high dependence by the main seed companies on the government as their main market.*
- *There was limited demand by smallholder farmers and, where government and NGO programs had created some understanding of the value proposition for using certified seeds, the farmer preference was to wait for the free or subsidized seed. It was nearly impossible to develop commercial seed supply systems, linking seed suppliers directly with smallholder farmers.*

These factors combined to distort the incentives of seed companies to develop a commercial seed market and did not incentivize an increase of smallholder farmer awareness about the value of certified seed. Consequently, they prevented the growth of the smallholder farmer demand for certified seed.

Although the general situation described above was not conducive to the development of the seed industry, three opportunities to support the seed sector stood out: (i) at the level of decision makers (Government of Mozambique and donors) there was willingness to change approaches in view of the problems and poor results of free seed distribution programs; (ii) the increasing number of private firms applying for seed licensing demonstrated its growing interest in the seed business; and (iii) there was an emerging increase in the demand for certified seeds for specific crops due to the growth in demand for soya, pigeon peas, sesame, maize and groundnuts.

Source: Extracted from Ribeiro, 2020.

The mid-term review appears to suggest that part of the reason for InovAgro's success in its support to private seed sector development is the fact that subsidized seed distribution stopped in the project area shortly after the project began in 2011 (Box 2).

The InovAgro project is considered to have been very successful in increasing access to high-quality seed through the private sector. A study undertaken in May 2018 on the availability and use of certified seeds from the commercial sector in Zambézia and Nampula provinces shows that there has been a significant increase in the use of certified seeds in both provinces from 2014/15 to 2016/17 respectively - about 10 times in Nampula and more than two times in Zambézia (cited by Arzeni *et al*, 2020).

Cyclone Idai response (2019)

In 2019, plans for the distribution of free seed as part of the response to Cyclone Idai caused considerable anxiety to the InovAgro project managers who warned in the 2019 annual report that this posed a risk to some of InovAgro's market systems interventions response: "As we go into the summer season for 2019/20, there is a tangible risk that the government, donors, and NGOs could wipe out years of progress building the seed market by passing lucrative tenders to seed suppliers, leading to little seed remaining for the companies to meet smallholder requirements. Since the seed companies have spent the past five years building relationships with the farmers and learning how to approach them, a sudden failure in providing seed would destroy the trust and confidence developed over these years. This would have a negative impact on the overall market system and productivity." Detailed information as to what actually happened to the relationship between seed companies and smallholder farmers associated with the InovAgro project has yet to be received.

More broadly, however, it is understood that the Idai response led to an agency-induced seed shortage in Mozambique. Aid agencies were competing against each other to procure seed from the existing seed companies and seed suppliers to the extent that they effectively bought up all the seed available through the formal seed system. The apparent 'lack of seed' that many agencies reported was created by the high levels of demand for emergency seed at short notice by the aid agencies, both for direct seed distribution and voucher-based programs. It is presumed that this would have left little or no formal sector seed available through the 'normal' market-based retail supply channels such as those developed by the InovAgro project over many years, as described above.

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