Market-friendly agricultural development: Implications for seeds and smallholders in Sub-Saharan Africa

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Abstract
Across Sub-Saharan Africa, efforts to produce and supply the agricultural technologies that are expected to intensify smallholder agricultural production are strongly market-oriented. Here, the case of maize seeds in Malawi provides new insights into some of the implications of this orientation. Malawi presents a context where market liberalization coupled with a national input subsidy programme has led to the growth of corporate power within the formal maize seed system and a strong reliance upon commercial providers to breed, multiply and diffuse new cultivars. At both the local and national levels, facets of this market-orientation mean that poverty reduction and climate change adaptation goals may not be met. In order to address these potential shortcomings, multiple measures are required. Institutions are needed to oversee the coordination of appropriate breeding and marketing efforts by corporate actors within the formal seed system; research programmes are required which can enhance understandings of genetic evolution within farmer-saved varieties and its implications for climate resilience; and policies must be carefully implemented which can support market participation by the poorest.

Keywords
Agricultural technology, climate change adaptation, poverty reduction, seed systems

Transactional technology transfer, climate change adaptation and poverty reduction
Aspirations for developing smallholder agriculture in Sub-Saharan Africa (SSA) have for some time been driven by the need to address the high levels of poverty and food insecurity which characterize livelihoods of large sections of the continent’s population. Today, climate change adds another dimension to these concerns, introducing questions about agricultural adaptation to current and future climate variability and change. For decades, agricultural development objectives in the region have been shaped by the assumption that promoting the use of modern cultivars for important staple crops such as rice and maize alongside inputs such as inorganic fertilizer and pesticides (in pursuit of an Asian-style ‘green revolution’) will lead to productivity transformations which will achieve food security and launch broader economic growth (Diao et al., 2010; Woodward, 1989). However, it is notable that attempts to launch Africa’s green revolution have met with much less success than originally anticipated, and contemporary yields across the continent remain far lower than those achieved elsewhere (Cairns et al., 2013). Despite this, the overarching developmental goals for smallholder agriculture have remained the same, and, while conceptual frameworks for understanding agricultural change have evolved from ‘a neat, transactional concept of technology adoption’ (Glover et al., 2016: 4; Rogers, 2003) to embrace a more complex systems-oriented perspective (World Bank, 2012), the strategies pursued continue to focus on promoting ‘superior’ forms of agricultural technology via market exchange. This editorial argues that these strategies overestimate the financial capacity of many smallholders, underestimate the contemporary importance of informal seed systems and farmer seed-saving within production activities and rely too heavily on business actors to incorporate public interest goals into their seed provision activities.

Increasing corporate dominance within Malawi’s formal maize seed sector
In the case of Malawi, where maize is the primary staple food, there has been an overarching focus on the promotion of hybrid maize cultivars since independence. During the
Like hybrids, early-maturing cultivars are also relatively more attractive to commercial players since they can produce a yield across a wider range of environments than late-maturing cultivars (which are only suitable in locations with longer rainy season duration). Producing more of one cultivar type with a greater marketable range again constitutes a sound commercial strategy since it facilitates an economy of scale at the seed bulking stage and requires less complicated distribution arrangements. However, early-maturing cultivars naturally yield less, achieving less vegetative development before seeds are produced, meaning that corporate over-provision of short season cultivars forecloses the option of achieving the potentially higher yields that local rainfall characteristics may permit in some areas if slower-maturing cultivars are used. Under the higher temperatures that will certainly be experienced as climate change progresses (which will mean maturity is reached even sooner), shorter season cultivar yields will be further reduced (Challinor et al., 2016). While breeding efforts driven by non-commercial initiatives (such as DTMA) are more likely to breed maize cultivars designed to complement smallholder adoption capacities and build longer term resilience, due to market liberalization these initiatives are now entirely dependent on commercial seed companies to multiply and market their cultivars. This means that the aforementioned commercial considerations also determine the availability (or lack thereof) of these ‘public good’ cultivars, because short-term profitability trumps other factors for corporate actors (Sutcliffe et al., 2016).

At the local level, the commodification of maize seeds and marketization of the formal seed system constitute a profound shift from the traditional patterns of access which continue to characterize the informal system. Smallholder access to modern cultivars is now determined by financial capacity, whereas seed of traditional (or local) cultivars were (and still are, although they are now less prominent within household cultivar portfolios) saved on-farm or accessed at no or very low cost from friends, neighbours and relatives. Access to recommended varieties today is thus characterized by inequalities according to household wealth and location. The promotion of modern cultivars via subsidies, extension and marketing activities has been accompanied by a significant decline in local knowledge about the cultivars being grown on farm. As such, smallholders have been found to possess poor knowledge of the names and traits of commercial cultivars and poor understanding of whether or not the cultivars they grow are OPV or hybrid (and thus whether seed should or should not be saved) (Sutcliffe, 2014). This decline in local agroecological knowledge brought about by the ‘industrialization’ of seed systems has been termed ‘agricultural deskilling’ (Kumbamu and Stone, 2007). It is concomitant with a loss of ‘seed sovereignty’ (Bezner Kerr, 2013) over germplasm because high levels of outcrossing in wind-pollinated crops such as maize mean that gene flow from modern hybrids will be altering genotype and trait expression within traditional landraces (which farmer selection practices over generations have adapted to local processing and consumption preferences and environmental conditions). As a departure from the open-pollinated...
Supporting seed systems to enhance climate change adaptation and poverty reduction

This is a necessarily brief snapshot of some of the incongruities in and between Malawi’s formal and informal seed systems which affect smallholder maize production and create barriers to realizing effective climate change adaptation and poverty reduction. The factors in Malawi that have led to the growth of corporate dominance in the seed sector (which include subsidy provision, liberalization and the market-friendly neoliberal persuasions of international donors) are replicated in agricultural development trajectories across SSA, making it likely that the issues discussed here will be important considerations for initiatives designed to support smallholder agriculture elsewhere. The market-friendly approach supports the development of seed systems which are focussed on short-term profit and oriented towards serving wealthier smallholders. To support the longer term goal of building resilience within smallholder production systems, this overriding market focus needs to be tempered with measures that make up for the likelihood that benefits will be missed by the poorest smallholders who struggle to engage in market exchanges and for the fact that corporate interests determine different cultivar provision objectives from those of the public sector. For maize seed in Malawi, such measures include scaling up (and increasing governmental support for) the social cash transfer programme, investing in research to better understand the implications of hybrid recycling and developing institutions that can more effectively oversee corporate breeding, multiplication and distribution of maize seed.

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