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What Drives Agricultural Input Subsidy Reform in Africa? Applying the Kaleidoscope Model of Food Security Policy Change

Danielle Resnick, David Mather, Nicole Mason, and Daniel Ndyetabula

Introduction

Input subsidies currently are one of the more contentious agricultural policies in sub-Saharan Africa. On the one hand, they can play a critical role in providing inputs to poor farmers. On the other hand, they typically raise questions about appropriate targeting, implications for agricultural budgets, and potential misuse for personal or political gain. The resurgence in agricultural input subsidies that began in the early 2000s and expanded throughout Africa during that decade precipitated a new wave of rigorous empirical research on the effectiveness of different modalities and pointed to some clear challenges across countries for these interventions (see Jayne and Rashid 2013; Minot and Benson 2009). Nevertheless, reforms to improve the effectiveness of agricultural input subsidy programs (ISPs) has occurred at a variable pace across countries and resulted in different design and implementation modalities. Understanding the reasons for such policy variation is useful for the international development and research communities in order to recognize when evidence is likely to have an impact on policymakers, which stakeholder interests are most important to consider, and how to disentangle whether it is low capacity, insufficient political will, or both that ultimately stymies input subsidy reform.

This brief synthesizes findings from three in-depth African case studies of ISP reform: Ghana, Tanzania, and Zambia (see, respectively, Resnick and Mather 2016; Mather and Ndyetabula 2016; Resnick and Mason 2016). The cases were guided by the Kaleidoscope Model of Food Security Policy Change, which provides a systematic framework for analyzing variations in policy reforms over time and across countries (see Resnick, Haggblade, Babu, Hendriks, and Mather 2017). The Model identifies a set of 16 hypotheses that collectively serve as “key determinants” to explain when and why policy change occurs. As seen in the inner circle of Figure 1, the Model

Key Highlights

- *Analyzes the process surrounding agricultural input subsidy policies (ISPs) in Africa*
- *Synthesizes the results of in-depth applications to Ghana, Tanzania, and Zambia*
- *Tests the robustness of the Kaleidoscope Model of Food Security Policy Change*
- *Distills key lessons for when and how policy change around ISPs is more feasible*

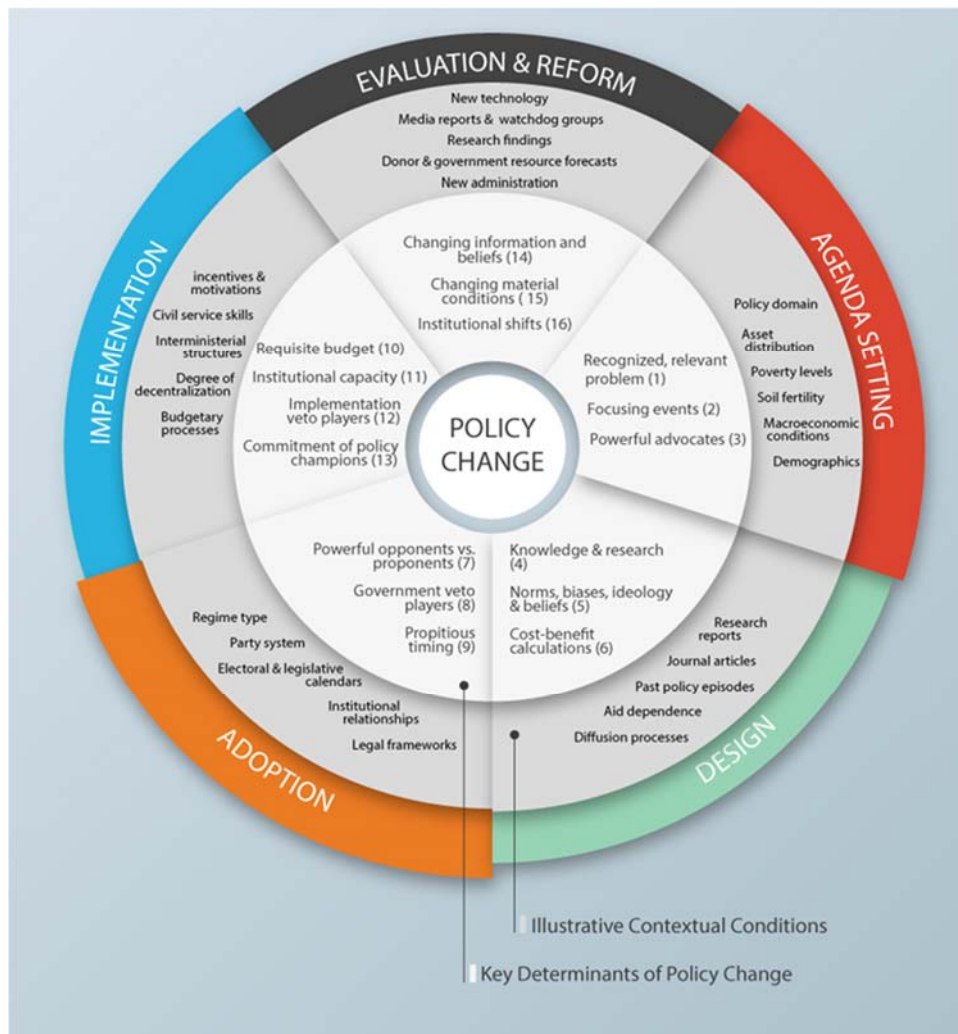
maps these 16 hypotheses into five key elements of the policy cycle: agenda setting, design, adoption, implementation, and evaluation and reform. In turn, these variables are shaped by a non-exhaustive range of “illustrative contextual conditions” provided in the outer grey circle. The Model’s name reflects that just as shifting a kaleidoscope refracts light on a new pattern, so does focusing on a particular stage of the policy process identify a different constellation of key variables that are important for driving change. Like the pieces of a kaleidoscope, many of the contextual conditions remain the same, but as policy dynamics unfurl, some factors tend to play a disproportionately larger role in driving toward policy change than others at any particular point in time.

Overview of Case Studies

To uncover the underlying drivers of policy change with regards to ISPs, the Kaleidoscope Model was tested through in-depth process tracing and semi-structured fieldwork in the Ghana, Tanzania, and Zambia.¹ The three countries share a history of input subsidies until



Figure 1: The Kaleidoscope Model of Food Security Policy Change



Source: Resnick, Haggblade, Babu, Hendriks, and Mather (2017)

structural adjustment programs in the 1990s compelled their governments to end such programs, which occurred to differing degrees (see Table 1). During that period, democratic transitions in all three countries gave greater weight to rural voters and crystallized key institutional features critical to broader policymaking. These features include proactive, presidential systems whereby executives hold disproportionate influence in proposing policies, parliaments that are often granted only oversight powers, and Westminster systems whereby cabinet members can be selected from the legislature, contributing to high levels of ministerial instability.

While all three countries returned to using input subsidies in the 2000s, Table 2 shows that the design features of these programs have varied immensely. Specifically, Ghana's Fertilizer Subsidy Program (GFSP) was initiated in 2008 and initially began as a targeted voucher program until the 2010 agricultural season when a waybill system was used. Under the waybill design, private sector importers, distributors, and retailers submitted receipts of the delivery of subsidized fertilizer at each stage of the supply chain: from importation to distribution to retail delivery to farmers. The government's role involved mostly approving the receipts presented to it by GFSP private-sector participants and reimbursing them accordingly. Farmers traveled to registered sales agents in their districts to obtain subsidized fertilizer and seed.

¹Please see Resnick, Haggblade, Babu, Hendriks and Mather (2017) regarding the operationalization of the 16 hypotheses in the Kaleidoscope Model.

Table 1: Comparison of Country Case Studies

Characteristic	Ghana	Tanzania	Zambia
Input subsidy history	Ended input subsidies in 1990 under structural adjustment	Ended input subsidies in 1994 under structural adjustment	Haphazard input subsidy liberalization during 1990s
Party system	Two party	Dominant party	Multi-party
Executive-legislative relations	Proactive, presidential system Parliament has retrospective and oversight powers Cabinet predominantly consists of MPs	Proactive, presidential system Parliament has retrospective and oversight powers Cabinet predominantly consists of MPs	Proactive, presidential system Parliament has retrospective and oversight powers Cabinet predominantly consists of MPs
Number of agricultural ministers, 2001-2015	4	7	9
Share of rural population (<i>date</i>)	46% (2015)	68.4% (2015)	59.1% (2015)
Rural poverty rate (<i>date</i>)	37.9% (2012)	33.3% (2011)	76.6% (2015)
Farmer organizations (<i>level of lobbying strength</i>) ^a	Peasant Farmers' Association of Ghana (<i>smallholder/ subsistence farmers, weak</i>)	Agricultural Council of Tanzania (<i>agribusiness and commercial farmers, medium</i>) MVIWATA (<i>small-scale farmers, weak-medium</i>)	Zambian National Farmers Union (<i>commercial/ large-scale farmers, strong</i>)

Sources: See Resnick and Mather (2016); Mather and Ndyetabula (2016); Resnick and Mason (2016)

Notes: ^aStrength refers to whether the organizations engage in advocacy, research, and project implementation as well as how much influence they have with their respective ministries of agriculture.

Zambia's Farmer Input Support Program (FISP), which reached approximately one million farmers in 2015, originally began in 2002 as the Fertilizer Support Program (FSP). The program has since gone through two major innovations. These include the expansion from a narrow focus on fertilizer and maize seed to a broader input scheme beginning in 2009 and the inclusion of a flexible electronic voucher (e-voucher) pilot program that started in 2015.

Tanzania's National Agricultural Input Voucher Scheme (NAIVS), also initiated in 2008 after some initial pilots, was considered one of Africa's most private-sector friendly schemes. Under this program, the private sector was responsible for the import, wholesale, and retail of fertilizer obtained at a subsidized price by farmers who received a voucher from participating agro-dealers. The government's role was limited to, among other things, distributing vouchers to eligible farmers. The number of targeted smallholder farmers has fluctuated from around

730,000 at the program's onset to as many as 2 million in the 2010/11 agricultural season.

ISPs Emerge on Policy Agendas

In all three countries, the Kaleidoscope Model explains the initial emergence of the various input subsidy programs on each country's agricultural policy agenda. The *recognized, relevant problem* in all cases was low use and limited affordability of inorganic fertilizer on food staple crops during the decade following market liberalization. In addition, *focusing events* in the form of natural disasters and extreme price hikes prompted policymakers to resort to a highly visible policy option with quick results, i.e. input subsidies, in order to address production shortfalls. This occurred earliest in Zambia as a result of the Southern African droughts of 2000-2002, which prompted a declaration of a humanitarian emergency.

Table 2: Comparison of ISP Case Study Countries

Characteristic	Ghana	Tanzania	Zambia
ISP program names (dates)	Ghana Fertilizer Subsidy Program (2008-present)	<ul style="list-style-type: none"> • Untargeted fertilizer subsidies (2003-2007) • Pilot targeted voucher program (2007-2008) • National Agriculture Input Voucher Scheme (2008-2014) 	<ul style="list-style-type: none"> • Fertilizer Support Program (2002-2008) • Farmer Input Support Program (2009-present)
Objectives of ISP programs	<ul style="list-style-type: none"> • Improve fertilizer application rates • Increase food security • Reduce poverty 	<ul style="list-style-type: none"> • Increase rice and maize production • Introduce farmers to improved maize and rice seed and chemical fertilizer • Strengthen private sector input supply chains 	<ul style="list-style-type: none"> • Expand private sector engagement • Ensure timely distribution of inputs • Improve access and competitiveness in input supply chain • Support rural cooperatives • Improve savings mobilization
Design of programs (dates)	<ul style="list-style-type: none"> • Targeted voucher (2008-2009) • Waybill system (2010-present) 	<ul style="list-style-type: none"> • Importers/distributors supply to medium-high potential zones; distributors/dealers pass savings on to farmers (2003-2007) • Targeted voucher (2007-2014) 	<ul style="list-style-type: none"> • Government supply/distribution system (2002-2014) • Integration of e-voucher Visa cards (2015-present)
Beneficiary criteria (dates)	<ul style="list-style-type: none"> • Smallholder, food crop farmers (2008-2009) • All food crop farmers (2010-12) • Smallholders involved in maize, rice, sorghum, or millet; women (2013-2015) 	<ul style="list-style-type: none"> • Medium-high potential zones (2003-2007) • Under NAIVS (2008-2014) <ul style="list-style-type: none"> ◊ Full-time farmer ◊ Cultivate max of 1ha maize/rice ◊ Able to co-finance purchase of input package ◊ Follow ag extension recs for input use ◊ Used little to no fertilizer and/or improved seed over past 5 years ◊ Preference for female-headed households 	<ul style="list-style-type: none"> • Member of farmer co-op or organization • Registered small-scale farmer (cultivating up to 5 hectares) • Not benefitting from Food Security Pack • Not defaulter to Food Reserve Agency • Can pay farmer contribution for inputs • Chiefs are eligible (2012-present)

Sources: See Resnick and Mather (2016); Mather and Ndyetabula (2016); Resnick and Mason (2016)

The global food and fuel price crisis of 2007/08, which substantially increased fertilizer prices, proved instrumental in either scaling up or launching ISPs in all three countries. While these two variables were also relevant to a large number of developing countries at the time, these three countries also had *powerful advocates* who advanced these programs, namely Presidents John Kufuor of Ghana, Levy Mwanawasa of Zambia, and Jakaya Kikwete in Tanzania. Fertilizer companies were also key advocates in the Ghanaian and Tanzanian cases as they saw the potential for expanding demand for their products.

Consideration of Design Modalities

At the design stage, three key findings emerge from the case studies. First, *knowledge and research* played less of a role in shaping the initial design of the programs than it did in subsequent refinements to them. However, once the programs were in place, a flurry of studies by international and local research organizations, universities, and civil society groups revealed common problems of leakage, crowding out of the private sector, and late disbursements of inputs. Knowledge diffusion was particularly key, with a focus on regional examples.

For instance, in Tanzania and Zambia, ministry of agriculture officials made study tours to Malawi to learn more about that country's targeted input subsidy program.² More recently, Ghana examined Nigeria's program to consider the possibility of integrating an SMS-based e-voucher technology.

In all three cases, the original design of the programs conformed to *existing biases and ideology* of the ruling governments and the donor community. In both Ghana and Tanzania, government input supply chains had been completely dismantled during the Structural Adjustment era, making a private sector design more feasible. In Zambia, liberalization had not proceeded as far in the 1990s and therefore, a government supply chain modality was the most obvious initial choice. In both Tanzania and Zambia, the respective ISPs originally had sunset clauses and an exit strategy that reflected donor biases about the non-sustainability of subsidies. As the ISPs unfolded, donors played a role in pushing for improved targeting through the waybill in Ghana, a "smart subsidy" approach in Tanzania, and through the e-voucher in Zambia.³

Relatedly, the donors assumed a large burden in helping these programs begin and expand, resulting in more favorable *cost-benefit calculations* for the African governments. Ghana received \$25 million from donors in May 2008 to assist with the global food and fuel price crisis and significant agricultural budget support funded the GFSP. Similarly, the World Bank financed 50 percent or more of the costs of NAIVS while Zambia initially benefitted from Highly Indebted Poor Country debt forgiveness and then Poverty Reduction Budget Support. Political benefits were also clear as these programs, aimed at rural voters, were perceived as a way of either winning votes for the ruling party (Ghana, Tanzania) or consolidating a very weak electoral mandate (Zambia).⁴ Subsequently, there were clear benefits to a number of proposed design changes. For instance, in Ghana, the waybill system held the promise of expanding the number of beneficiaries while reducing the government's administrative burden associated with the initial voucher system. In Zambia, a viable example of a prepaid Visa card modality provided by the Zambian National Farmers' Union offered the prospect of reducing leakage, improving timeliness of distribution, broadening the array of inputs that farmers could purchase, and strengthening ties with the banking and private sector. In Tanzania, the expansion of vouchers to drier regions of the country, which was not the original intention, offered a wider range of Members of Parliament political benefits vis-à-vis their constituencies.

Transforming Proposals into Adopted Policies of Design Modalities

The initial adoption of the various ISPs faced very little resistance, reflecting that there were few *powerful opponents vis-à-vis proponents*. Given the crisis situations that precipitated these programs, a broad coalition of ministries of finance and agriculture, parliamentarians, fertilizer suppliers, donors and farmers' organizations originally supported the programs in all three countries. This lack of strong opponents may have reflected the constellation of *veto players* in these countries. Veto players are the set of individuals or institutions whose concurrence is needed for a policy to move forward (see Tsebelis 2002). Due to the strength of presidential powers in these countries, the presidents are tantamount to the key *veto players* and, as noted earlier, they were often the initial supporters of their original ISPs, announcing the programs as a *fait accompli* to their parliaments in the cases of Ghana and Zambia.

As problems with the various ISPs became more apparent over time and design changes were proposed to tweak rather than to completely abolish the programs, opponents were again relatively rare. Ministries of finance and parliamentary oversight committees had an interest in reducing expenditures while ministries of agriculture, donors, and farmers' organizations wanted more effective programs. In some cases, as with the e-voucher in Zambia, big fertilizer suppliers opposed reform, but they did not carry the same collective weight as the other stakeholders.

Government veto players also supported design changes since such changes either allowed for an expansion in beneficiaries or, in cases where new presidential administrations took over, such changes helped solidify electoral campaign promises to improve ISPs (e.g. Zambia).

² In Tanzania and Zambia, the names of the ministry of agriculture have changed during the course of their ISPs. To avoid confusion, we just refer to a generic ministry of agriculture throughout rather than using exact acronyms.

³ For more information on the tenets of "smart subsidies" see Morris et al. (2007).

⁴ For these political economy dimensions in Ghana and Zambia, see Resnick and Mather (2016) and Resnick and Mason (2016), respectively. For Tanzania, see Kjaer and Therkildsen (2013).

While not an overriding factor, *propitious timing* cannot be completely discounted in the adoption process. Indeed, in Ghana, the GFSP was announced just seven months before the 2008 presidential and parliamentary elections and followed recent completion of the Food and Agricultural Development Policy II, which highlighted the importance of inputs for agricultural production. In Zambia, the initial FSP followed right after the contentious 2001 elections but with enough time before the 2002 agricultural season. By contrast, in Tanzania, the timing of announcing the program appeared less consequential for its adoption.

Ensuring Implementation Occurs on the Ground

Translating subsidy policies into actual programs required a confluence of four factors. First, and most importantly, was the actual release of the *requisite budget* expenditures that had been promised for the programs. In Ghana, sectoral budget support that began in 2008 ensured the program was actually launched and comprised as much as 70-80 percent of expenditures on the GFSP in some years. In Zambia, donors allocated \$1.2 billion between 2002-2004 to support implementation of the Poverty Reduction Strategy, which accorded priority to agriculture. Poverty reduction budget support enabling FISP (then FSP) began in 2006 and enabled the program to continue beyond its original three-year time horizon. A decade later, funding coordinated by the European Union allowed for key logistical elements of the e-voucher to be implemented. In Tanzania, the implementation of NAIVS in 2008 cost approximately 35-40 percent of the Ministry's budget and constituted the largest single item. Donors contributed around \$190 million while the Government made up the shortfall.

Institutional capacity was both required for the roll-out of these programs as well as explained some discrepancies between intended and actual implementation. Such capacity consists of not only the ability of the bureaucracy to oversee policy implementation but also administrative coordination across all entities involved. There are various functions required for these programs to run smoothly, from identifying beneficiaries, distributing vouchers or inputs directly, and ensuring agro-dealers, wholesalers, and importers are paid in a timely manner. In all cases, a heavy emphasis has been given to engaging subnational tiers of agricultural bureaucracy, including regions/provinces and districts to even wards and villages. At the outset, district agricultural units were too weak and underfunded to appropriately monitor the program (e.g. Zambia), and ISPs diverted most of their time away from their primary extension activities (e.g.

Ghana and Zambia). Other capacity constraints included insufficient awareness of agro-dealers regarding appropriate seed and fertilizer storage (e.g. Tanzania). Early on, Zambia's parastatal did not have sufficient capacity to provide D compound fertilizer while later challenges under the e-voucher included insufficient ability by the originally selected banks to produce the required Visa cards. Beyond these idiosyncratic issues, the most common capacity constraint across all three countries was distributing inputs in a timely manner in advance of the agricultural season, either due to late announcement of the program (e.g. Ghana) or late payments to importers due to delays in transfers from finance to agricultural ministries (e.g. all three countries).

The latter issue had the most impact on *implementation veto players*. This refers to the designated implementers -- from the private sector, NGO or local agencies -- who have both the incentives and willingness to implement a policy program. In the case of the ISPs in these three countries, this involved agro-dealers, wholesalers, and fertilizer and seed suppliers and importers. All of these private sector actors needed to agree to participate for implementation to occur. Yet, fertilizer importers often were able to halt or delay the programs when they had not been paid for one or more years, including in 2007 in Zambia as well as in 2014 in Ghana and Tanzania. At the most extreme, the future of GFSP has been questioned due to the decision of major suppliers to no longer participate. In Tanzania, in the 2012/13 agricultural season, importers also demanded that they, rather than district officials, select their preferred agro-dealers, which they were ultimately granted.

The above three variables strongly intersect with the availability and commitment of *policy champions*, which typically refers to high-level bureaucrats or political leaders that sustain program momentum even when others' attention might fade. The array of champions for the initial stage of ISPs was much larger when food and fertilizer prices were high, funding support from donors was forthcoming, and incumbent political parties perceived an electoral benefit from them. Subsequent refinements of the programs, including Tanzania's NAIVS and Zambia's e-voucher, have been propelled through the leadership of key agricultural ministers and supported by major agricultural associations, such as the Agricultural Council of Tanzania and the Zambian National Farmers' Union. By contrast, the haphazard implementation of Ghana's GFSP reflects the variable support for it across different agricultural ministers, the exclusion of distributors when setting the subsidy rate, the lack of a strong farmers' association outside the cocoa sector, and a comparatively higher urbanized population.

Evaluation, Re-consideration and Reform

Once a policy is entrenched, changing the policy can be much more difficult than initiating it. This is because stakeholders increasingly realize their own losses and gains to reform, and administrative machinery has already been established that can be costly and time-consuming to change. In all three countries, major policy reforms to the original ISPs were affected by *changing information and beliefs* precipitated by a preponderance of independent research, media reports, and parliamentary inquiries. For instance, in Ghana, research not only showed that the original targeted voucher scheme was administratively burdensome and not reaching predominantly smallholder farmers but also revealed that a large part of fertilizer costs was due to the high cost of transport, resulting in the switch to the waybill approach. In Zambia, the original FSP and its FISP successor were assessed by myriad organizations, researchers, and the Auditor General. Suggestions regarding how to improve FSP and how to implement the FISP e-voucher were communicated in stakeholder workshops in 2008 and 2015, respectively.

Consistently across all three countries, governments' receptivity to new information became more pronounced when there were also *changing material conditions*, and particularly a shift in the amount or modality through which ISPs were being funded. As the main purveyor of agricultural sector budget support in Ghana, the World Bank requested research on the original voucher method and used its leverage to push for the waybill reform. Once agricultural budget support was canceled in favor of general budget support, payments to importers became more delayed. The halting of general budget support entirely in 2013 due to a deterioration in the country's macroeconomic conditions put the entire GFSP into question. Indeed, despite promising to import 180,000 MT of fertilizer in 2015, the Ministry admitted that only half of that total was imported due to insufficient funds to pay suppliers. In Zambia, the arrival of the food and fuel price crisis in 2008 exacerbated the cost of FSP and prompted the Ministry of Finance to question the high costs of the program, eventually leading to greater awareness of and engagement with existing research on FSP and contributed to the FISP reform. Macroeconomic crisis in Zambia and the ending of general budget support in 2012 also prompted consideration of improving the cost-effectiveness of FISP. The availability of targeted financing for the e-voucher from the EU and others, and the opportunity of streamlining the program to remove non-existent farmers from the beneficiary register, facilitated those reforms. Finally, NAIVS was specifically supported by time-delimited funding from the World

Bank, known as the Accelerated Food Security Program (AFSP). Thus, once AFSP was completed in 2013/14, NAIVS ended in the 2014/15 season due to insufficient funds to repay importers for previous seasons. The government managed to re-start NAIVS in 2015 with its own resources in the lead up to that year's elections.

The confluence of changing information and material resources sometimes had the greatest impact when they coincided with *institutional shifts*, which can be political or bureaucratic changes. In Ghana and Zambia, these shifts included the arrival of new presidents in office with their own policy agendas, especially if they represented an erstwhile opposition party. In both countries, the arrival of proactive new ministers of agriculture in 2010 (Ghana) and 2015 (Zambia) enabled open discussions about reform possibilities. However, the fact that institutional shifts were not a major factor in the Tanzanian case, despite changes occurring there, illustrates that this is a sufficient but not a necessary condition for reform.

Conclusions and Broader Implications

The empirical analysis from the three country cases reveals that while not all 16 variables embedded within the Kaleidoscope Model are relevant for explaining all policy reform episodes, they do constitute the maximum set of factors that policymakers and researchers should consider when trying to identify opportunities for, or constraints to, policy reform. Along with seizing opportunities afforded by focusing events and allying with policy advocates, reformers need to recognize the powerful combination of strong research, available budgetary resources, and political incentives when pushing for policy change. In particular, research may exert more impact in subsequent rounds of reform than when a policy is initially exerted, unless policymakers are interested in learning from other country examples before considering design modalities. Donors can play a big role in commissioning research that can be leveraged when windows of opportunity emerge, either in the form of changing material circumstances or institutional shifts. In addition, the case studies reveal that while policy champions are key, donors and researchers should not simply try to find champions among agricultural ministries due to the high probability of ministerial turnover. Instead, building broad stakeholder support, particularly within ministries of finance and the office of the president, is critical for reform.

With respect to ISPs in particular, a number of specific lessons can be distilled. First, delayed disbursements to importers and distributors are very common, which are

often due to delays in transfers from finance ministries to agricultural ministries. Improving inter-ministerial cooperation and the alignment of budget calendars with agricultural planting seasons therefore cannot be underestimated. Second, multiple objectives for the programs, from enhancing productivity and fertilizer use, to reducing poverty, to expanding private sector engagement, can result in complex program designs that may be inappropriate given existing institutional capacity. Third, once implemented, these programs can become intensely political with perceived opportunities for vote buying or elite patronage during the tendering and procurement process. This belief has a lot of emotional resonance among those who might otherwise champion reforms and suggests that efforts to improve ISPs, or retrench them entirely, are unlikely to gain much traction if based on technical arguments alone. Finally, the degree to donor funding is fungible affects how much influence donors have in structuring the design of these programs. Donors seemed to have had the most influence in Tanzania by providing a loan to support a “smart subsidy” under NAIVS and the least in Zambia, where poverty reduction general budget support gave the government a great deal of control over how much money went to the program.

To conclude, while there are many studies of the impacts of ISPs across Africa (see Jayne et al. 2016 for a review of such studies), there are few accounts of the full range of policy process dynamics underlying these programs. In turn, this inhibits our understanding of when and why ISPs are chosen by governments, what underlies key moments of innovation within these programs, and the main criteria for their sustainability. The Kaleidoscope Model helps fill this void by providing a set of focused and tractable hypotheses to address these dynamics and thereby guide the efforts of those donors, researchers, and national governments concerned with improving the effectiveness of such programs over time.

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