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The Kaleidoscope Model of policy change: Applications to food security policy in Zambia

Danielle Resnick [a,*], Steven Haggblade [b], Suresh Babu [a], Sheryl L. Hendriks [c], David Mather [b]

[a] International Food Policy Research Institute, 2033 K Street NW, Washington, DC 20006, USA
[b] Michigan State University, Justin S. Morrill Hall of Agriculture, 446 West Circle Dr., Rm 202, East Lansing, MI 48824-1039, USA
[c] Institute for Food, Nutrition and Well-being, University of Pretoria, Pirvate Bag X20, Hatfield, Pretoria 0081, South Africa

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ABSTRACT

What drives policy reform after long periods of policy inertia? What factors shape the effectiveness of policy implementation following reform decisions? These questions increasingly concern the international donor and research communities, given the importance of policy environments in shaping development outcomes and the growing need to achieve development impact with scarce resources. To address these questions, this paper introduces the Kaleidoscope Model of policy change. Inductively derived from empirical examples in developing countries, political economy literature, and theoretical scholarship on the policy process, the model proposes a set of 16 operational hypotheses to identify the conditions under which policies emerge on the agenda and ultimately are implemented. The paper tests the model empirically in Zambia by evaluating eight policy reform episodes related to agricultural input subsidies and vitamin A fortification. Empirical application and hypothesis testing rely on rigorous process tracing using secondary sources and semi-structured interviews with a purposive sample of 58 stakeholders in Zambia. In the policy reforms studied, a majority of the KM's core variables proved robust across the two distinct policy domains, while a handful emerged as relevant only episodically. In an era of growing pressure on donor resources and government budgets, the Kaleidoscope Model offers a practical framework through which practitioners and researchers can assess when and where investments in policy reforms are most feasible given a country's underlying political, economic, and institutional characteristics.

1. Introduction

The "results-based agenda" that emerged more than a decade ago in the wake of the Millennium Development Goals and the Paris Declaration for Aid Effectiveness has resulted in growing donor demands to achieve and measure policy impact (OECD, 2014; Ravallion, 2009; White, 2014). As the development community transitions towards the Sustainable Development Goals, achieving meaningful and timely policy impact undoubtedly will become even more important. Motivations include improved accountability to donor country taxpayers and increased responsiveness to the needs of developing country citizens. Yet, policy impact requires an informed understanding of the nuances of policymaking processes to recognize the opportunities for, and feasibility of, generating intended reforms.

Interest in policy processes has given rise to several distinct bodies of literature and experience in policy systems, each with important strengths but also some shortfalls. Academic theories about public policy and political economy provide a rich and nuanced perspective on policy change (Birkland, 2010; Cairney & Heikkila, 2014; Weible, 2014). Yet, such theories collectively identify many relevant variables in the policy process, which provides little guidance for engagement by practitioners. A meta-analysis of the public policy literature conducted 30 years ago revealed more than 100 variables advanced by scholars to explain drivers of policy implementation alone (O'Toole, 1986). Since then, further proliferation of variables has led sceptics to dismiss the value of policy process analysis as too context-specific and not rigorous enough to uncover generalizable findings (Goodin, Rein, & Moran, 2006; Meier, 2009; Smith & Larimer, 2017).

Outside the academic arena, donors have likewise recognized the importance of understanding policy and political processes in

* Corresponding author.
E-mail addresses: d.resnick@cgiar.org (D. Resnick), blade@msu.edu (S. Haggblade), s.babu@cgiar.org (S. Babu), sheryl.hendriks@up.ac.za (S.L. Hendriks), matherda@msu.edu (D. Mather).

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developing countries. At least 27 donor agencies have adopted some type of political economy framework (Resnick & van de Walle, 2013). However, many of these frameworks are narrowly oriented to specific sectors or programs (Eaton, Kaiser, & Smoke, 2010; Fritz, Levy Ort, 2014). In terms of engagement on the ground, donor-led reform efforts implicitly have relied on a handful of common approaches to generate behavioral change among policy makers, such as policy conditionality and more recently "mutual accountability." These highly focused approaches respectively assume that policy change depends on a combination of carrots and sticks, or espoused commitments to ostensibly shared policy agendas and targets (OECD, 2016). Such standardized views risk obscuring the complexities of policymaking both across and within countries.

This paper draws together evidence and experience from the academic and donor communities to develop a practical and holistic framework for analyzing the policy process in developing country contexts. Known as the Kaleidoscope Model (KM), the framework draws on actual episodes of policy change from the public administration, political science, and international development experiences to inductively derive a set of variables likely to prove important across multiple policy arenas and country settings. Although applicable to a broad range of policies, this paper empirically applies the KM to public policies related to food security. Specifically, we focus on eight episodes of policy change across two very different domains of food security policy in Zambia: agricultural input subsidy programs (ISPs) and vitamin A fortification.

The following section introduces the KM. Thereafter, we follow an approach used by public policy scholars (e.g. Baumgartner & Jones, 1993; Sabatier & Jenkins-Smith, 1993a) by empirically testing the KM on a set of cases distinct from those used to derive the framework. The discussion summarizes which KM variables proved most robust based on the Zambian case studies. The conclusion offers implications of the KM for advancing cross-country comparative policy process research and identifying opportunities for policy engagement.

2. The Kaleidoscope Model of policy change

The Kaleidoscope Model (KM) explicitly focuses on understanding formal manifestations of public policy, defined by Birkland (2010) as the decisions of government that are codified in statutes, laws, regulations, government programs, and executive decisions.[1] Like Sabatier (1998), we recognize that policy change manifests in major spurts involving a wholesale reorientation (e.g. introducing a national health insurance scheme) as well as in more minor, instrumental changes (e.g. altering tax rates to fund the scheme or expanding the scope of services covered). We refer to both types of policy changes as "policy reform episodes."

The KM was inductively constructed following a "synthetic" analytic approach (Cairney, 2013) that combines existing academic and donor perspectives on policy change with empirical findings from case studies of reform in developing countries. In doing so, a core set of 16 variables is distilled across this diverse scholarship that repeatedly constitute proximate drivers of policy change in a broad range of low-income countries and policy settings. The inner circle of Fig. 1 highlights these core variables. Following other work (Fox & Reich, 2013; Kaufman & Nelson, 2004), they are organized according to five stages of the policy cycle: agenda setting, design, adoption, implementation, and evaluation and reform. While acknowledging that the policy process is iterative and nonlinear (Sabatier, 2007), most existing theories and studies on policy process implicitly focus on one or more of these stages (deLeon, 1999; Howlett, Ramesh, & Perl, 2009). Thus, the stages serve as a heuristic device to emphasize which variables take precedence at different stages rather than as a predictive theory positing that policymaking occurs in a teleological manner.

In turn, numerous contextual conditions are delineated in the middle ring of Fig. 1. They are not an exhaustive list on their own; instead, they are intended to illustrate, based on accumulated scholarship, the vast range of factors that have been identified over the years as relevant to influencing the inner circle. These contextual conditions have a strong affinity to certain elements of the policy process, which is emphasized by their placement in Fig. 1. However, the lack of borders between the policy stages for the middle ring emphasizes that this affinity is not exclusive and that certain contextual factors may indeed be relevant at multiple points in the process.

The KM is a framework rather than a theory. As Ostrom (2007: 25) notes, "Frameworks organize diagnostic and prescriptive inquiry...They attempt to identify the universal elements that any theory relevant to the same kind of phenomena would need to include." The KM is probabilistic and correlative, suggesting that the presence (or absence) of a particular variable is more (or less) likely to explain policy change. Repeated empirical testing, guided by some of the tools presented here, will provide greater confidence regarding which of the 16 variables tend to be more consistently important and take precedence over others. The rest of this section describes the framework in greater depth.

2.1. Agenda setting

Why do certain issues emerge on the policy agenda while others do not? Three common explanatory variables recur in the literature. First, policy needs to address a *recognized, relevant problem* for key segments of the country's population (Kingdon, 1984, 1995). The relevance criterion narrows the range of policy issues that could potentially emerge on the agenda because only certain problems will resonate with decision makers. In turn, contextual conditions, such as a country's level of poverty or macroeconomic performance, shapes the resonance of specific issues (Binswanger & Deininger, 1997). For instance, in those countries where chronic undernutrition emerged on the policy agenda in recent years, one of the most influential factors was clear evidence on the size and urgency of the problem (Pelletier et al., 2012).

Yet, a relevant problem rarely engenders a policy intervention on its own. A second variable is the occurrence of a *focusing event.* The policy literature has referred to such events as "critical junctures" (Collier & Collier, 1991), "punctuated equilibria" (Pierson, 2004; Thelen, 2003), or "windows of opportunity" (Kingdon, 1984, 1995). In all cases, they refer to a non-routinized but time-delimited event that has the capacity to significantly alter the options available to policy makers. A focusing event may be a major food or price crisis, an economic collapse, regime change, or a natural disaster (Birkland, 1997). The urgency of such events, such as the 2007–2008 food price crisis, may close off certain policy options and thus require exploration of new policy instruments (see Pinstrup-Andersen, 2015). In other cases, focusing events may include high-level international summits or declarations that elevate the status of certain policy issues and diminish others (e.g. the Maputo declaration on agriculture or the Rio + 20 initiative for sustainable development). In still other cases, a focusing event may refer to major scientific breakthroughs and technological changes since these re-define what is feasible and shift the constellation of policy advocates (Weible, 2014).

Finally, *powerful advocates* play a key role in pushing for action. Given that countries confront multiple problems simultaneously,

[1] In other words, we are not looking at informal public policies, such as the implied rules that govern interactions of public officials, such as in city councils or legislatures (see Schneider & Ingram, 1997).

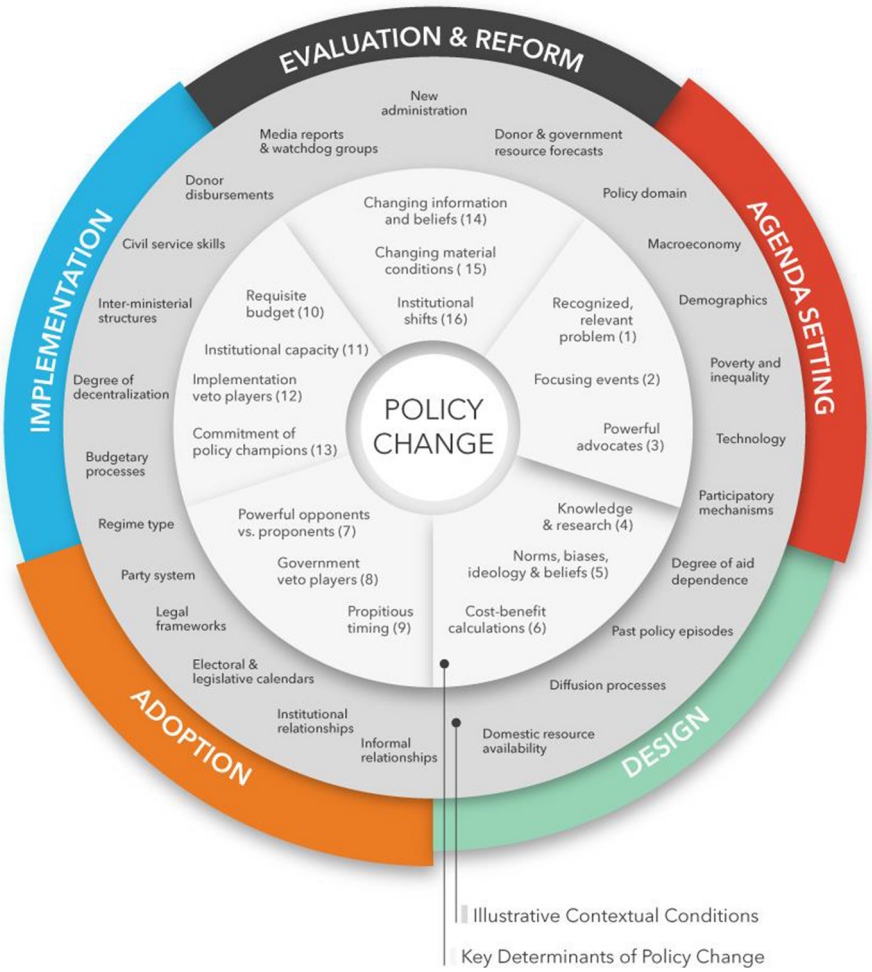

Fig. 1. Kaleidoscope Model of policy change.

advocates can frame one problem as having more immediate or consequential impacts than another (Sabatier & Jenkins-Smith, 1993b; Zahariadis, 2007). These advocates come from a range of sources, including government ministries, civil society, the private sector, the research community, foreign investors, or donor agencies. In the case of malnutrition, international advocates such as the United Nations' High Level Task Force and UNICEF, along with national presidents, were instrumental in placing nutritional issues on the policy agenda (Acosta and Fanzo, 2012). Significantly, while advocates may manifest through coalitions of like-minded stakeholders (Sabatier & Jenkins-Smith, 1993b), they can equally be individuals with extraordinary autonomy to shape the agenda. For instance, in many developing countries, constitutions accord executives with almost unilateral powers to prospectively set the policy agenda (Cheibub, Elkins, & Ginsburg, 2014). More broadly, the power of these advocates can be linked to their organizational mobilization (e.g. labor unions, farmers' unions), fiscal relevance (e.g. international donors, private investors, party financiers), or institutional clout (e.g. cabinet members, party leaders, presidents). The nature of extant participatory mechanisms is one contextual condition that, along with power, determines which advocates have a greater voice (McAdam, Tarrow, & Tilly, 2001).

2.2. Policy design

During the design stage, policy advocates propose a menu of solutions to address the policy problem. Three factors appear to play an important role in explaining how policies are designed. One factor is *empirical research and knowledge* disseminated through epistemic communities of researchers, donors, policy entrepreneurs, and technocrats (Haas, 1992). If perceived as credible and legitimate, such communities can provide authoritative evidence of what policy design features will work best to achieve particular goals (Court & Young, 2004; Haas, 2004). Such communities can also facilitate the diffusion of knowledge about successful policy experiments tried elsewhere. The media further plays a role in the diffusion of knowledge but may privilege certain policy design options through oversimplification of the policy problem (Parsons, 1995).

A distinct but related factor driving policy design involves *norms, biases, ideologies, and beliefs*. While there may be secondary beliefs about the narrow design features of a policy, these may be informed by deep beliefs about human nature shaped by norms and socialization (Sabatier & Jenkins-Smith, 1993b). The type of focusing event identified in the agenda-setting stage can play a strong role in this regard. Crises, for example, reduce the time for thoughtful analysis, prompting policymakers to prefer on-the-shelf solutions from elsewhere or rely on "bounded rationality" (Simon, 1972), cognitive shortcuts, and deep beliefs. For example, the food price crisis of 2007–2008 caused African governments to sometimes pursue disadvantageous trade policies that reflected long-standing mistrust of private traders (Dorosh, Dradri, & Haggblade, 2009). Ideologies of ruling parties about the role of the state vis-à-vis markets can likewise shape which policy designs are feasible. Even among epistemic communities, there may be

stark divisions about appropriate policy design due to institutionally entrenched technical perspectives and different perceptions of the definition and cause of a policy problem (Freeland, 2013; Shiffman & Smith, 2007).

Ideas and beliefs, however, intersect with *cost-benefit calculations*. Policy designs shape the interest group dynamics that emerge and subsequently influence policy adoption. These calculations may involve political goals, such as winning votes, or more traditional financial concerns about affordability. In aid-dependent countries, policymakers may give weight to donor preferences for a particular policy design to obtain resources necessary for policy implementation.

2.3. Policy adoption

Even after a set of reform designs has been proposed, it cannot be assumed that a policy reform will be adopted (Pierson, 2004). A first critical determinant of adoption is the *relative power of opponents versus proponents*. Opponents or proponents may not surface at the agenda setting stage but rather after a policy design is solidified and the potential "winners" and "losers" of a policy reform become clearer. They may not necessarily have the legal and institutional authority to block or pass a policy, but their efforts may exert a strong emphasis on those who do based on institutional and informal relationships with government veto players.

Indeed, *government veto players* constitute the second significant factor shaping policy adoption. Veto players are those individual or collective actors whose concurrence is necessary for policy adoption to proceed or, alternatively viewed, whose lack of concurrence proves fatal for adoption (Tsebelis, 2002). When veto players were also policy advocates in the agenda-setting stage or played a pivotal role in the design, one would expect that they would be more likely to push the policy forward in the adoption stage. Malawi from 2007 to 2010 offers a paradigmatic case given the strength of the president, the late Bingu wa Mutharika, and his dual role as Minister of Agriculture during those years. His announcement during a political rally in 2008 of institutionalizing a maize export ban to help the country with the food crisis was essentially presented as *a fait accompli* (Chirwa & Chinsinga, 2014).

Veto players typically are identified by a country's constitution, legal frameworks, and political system. Democracies, parliamentary systems, and federal countries usually have more veto players than authoritarian systems, presidential, and unitary countries. Policy change typically is much slower when there are more veto players because a greater range of stakeholder interests need to be taken into account, especially when opponents are powerful (Bueno de Mesquita, Bruce, Siverson, & Morrow, 2003; Tsebelis, 2002). By contrast, authoritarian systems may be more insulated from a broad array of interest groups (Booth & Golooba-Mutebi, 2012; Evans, 1995; Poulton, 2014). In this way, regime type and party system are among the contextual conditions defining the veto players, but they are only important insofar as they delineate the number and identity of the veto players who ultimately decide whether policies will be adopted. The policy domain under consideration is also relevant since it delineates the range of ministers, legislative, judicial, and regulatory actors whose concurrence might be collectively required for policy change.

When and how quickly adoption occurs often involves a degree of *propitious timing,* which in turn is shaped by the nature of the policy. If parliamentary approval is needed, then adoption depends on the legislative calendar. If proponents want to gain political traction for a policy, they may consider the electoral calendar. For instance, while India's Congress Party had included broad food subsidies in its 2009 election manifesto, the ultimate passage of the Food Security Act in 2013 as a presidential ordinance was timed during the 2014 election campaign, leading the opposition to dub it the "vote security act" (Iyer, 2013). By contrast, adoption of regulatory policies, such as for bio-, seed, or food safety regulations, might be slower given the need for review by relevant legal authorities (Jaffe, 2006).

2.4. Policy implementation

Policy implementation refers here to administrative changes, public expenditure outlays, and the delivery of the actual goods and services promised by the policy. The nature of a policy dictates how closely intertwined the adoption and implementation stages might be. If a policy change belongs to the "stroke of the pen" genre, which is how many macroeconomic or deregulation reforms are characterized, then adoption is tantamount to implementation (Grindle, 2004a).

A key requirement for implementation is access to the *requisite budget*. Delays in resource disbursements may trigger delays in implementation. For instance, the implementation of Malawi's Farm Input Subsidy Programme was initially delayed due to donor threats to rescind aid (Chirwa & Chinsinga, 2014). Likewise, former Kenyan President Daniel Arap Moi stalled on implementing a national health insurance fund, even after it was passed by Parliament, because of concerns over its costs (Grépin & Dionne, 2013). Historically, many large-scale donor efforts to promote policy change have focused on tied aid that links disbursements of external resources to specific policy reforms (Kherallah et al., 2000).

Implementation also requires a certain degree of *institutional capacity* among the agents responsible for rolling out or scaling up the policy. This encompasses not only technical capacity, such as education, skills, and infrastructure, but also administrative capacity. The degree of policy complexity, the periodicity of the policy (e.g. one-time change or annual oversight), and the potential need to adhere to international standards (e.g. Cartagena Protocol for biosafety) dictate the required levels of capacity. If policy implementation is to be partly controlled by subnational authorities, then local governments need the requisite resources and training to fulfill their mandates (Lapping et al., 2012; Pelletier et al., 2012). Inter-sectoral capacity is also a challenge for implementation, especially for nutrition or agricultural biotechnology (BirnerKone, Linacre, & Resnick, 2007; Gillespie, 2014).

In cases where decision makers delegate policy implementation to the private sector, civil society or sub-national government agencies, discretionary application by these agents can lead implementation to deviate from the designers' intent or even stymie implementation altogether. In these instances, *implementing stage veto players* emerge. For instance, Lipsky (1980) highlighted how low-level bureaucrats exercise a high degree of discretion when implementing policies at the local level. Similarly, private sector actors may sometimes refuse to implement government policies that undermine their profitability or competitive advantage.

To overcome incentive, resource, and capacity challenges, the *commitment of policy champions* remains critical. These champions typically are high-level bureaucrats or political leaders that sustain momentum even when others' attention might fade (Pelletier et al., 2012). Champions can help give legitimacy and support to implementing agencies, or recognize bottlenecks and create new agencies. Operational examples supported by donors include the Africa Lead Champions of Change program (DAI, 2014), the Alliance for a Green Revolution in Africa (AGRA) policy champions (AGRA, 2014), and Transform Nutrition champions.

2.5. Evaluation and reform

Most policies are consistently subjected to small refinements or even completely overhauled. One reason is the *changing information and beliefs* about the effectiveness of a policy or its original

goals. At the most extreme, policy makers may change their goals entirely due to the emergence of new debates and paradigms. Hall (2013) focuses on the shift from Keynesianism after World War II, when the goal was to secure full employment through government intervention, to monetarism and neoliberalism in the 1980s, which stressed inflation targeting and privileging market forces over the state. More typically, policymakers learn from past policy mistakes as research findings, media reports, and parliamentary inquiries assess policy effectiveness.

The second factor, which strongly interacts with the first, is *changing material conditions.* Such conditions include the continued availability of financial resources given the macroeconomic environment, especially for those policies that require a consistent outlay of expenditures, such as subsidies or social transfers. A highly consequential change in material conditions occurs when the original relevant problem that engendered the policy has been addressed.

The third factor is the emergence of *shifts in the institutional setting.* Institutional changes can upend the entire policymaking machinery. Such changes include the arrival of a new cabinet minister or president, or the reshuffling of parliamentary committees. For instance, frequent ministerial turnover in places as diverse as Senegal and Nepal has been tied to a high level of agricultural policy volatility (Quinn & Gupta, 2013; Resnick, 2014). In some cases, these shifts create a new set of veto players who may want to create their own legacy and stake a new direction.

2.6. Empirical application of the Kaleidoscope Model

We refer to the resulting framework as the Kaleidoscope Model because just as shifting a kaleidoscope refracts light in a new pattern, so does focusing on a particular stage of the policy process reveal 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 in the background, but as policy dynamics unfurl, some factors tend to play a disproportionately larger role in driving toward policy change than others. In other words, many of the 16 variables may be relevant throughout the entire policy process and demonstrate important feedback effects with each other. Focusing events, for instance, may have lasting effects on policy design, or affect the positions of opponents with respect to adoption. Yet, the academic and empirical scholarship suggests that the set of key drivers we have identified take center stage at particular times in the policy process while playing only secondary roles during others.

Table 1 summarizes the 16 key variables, the hypotheses that underlie their relationship with policy change, and their measurement. In our fieldwork, these definitions proved particularly important given that conceptual ambiguity and measurement variation are two of the common critiques of comparative policy process research (see Cairney & Heikkila, 2014; Goodin et al., 2006).

Three principal tools guide empirical applications of the KM. First, a detailed policy chronology facilitates process tracing by indicating whether and which types of events precipitated subsequent policy changes. Second, stakeholders are mapped according to their relative power and preferences using circle of influence graphics (see Grindle, 2004b). The inner circle of these graphics delineates those actors that hold power over change in a particular domain. Finally, a hypothesis table summarizes the presence or absence of each KM variable in driving policy change to facilitate comparisons across countries or policy domains.

3. Applying the Kaleidoscope Model to food security policies in Zambia

Many comparative studies of the policy process focus on just one policy subsystem, such as education (Grindle, 2004a), public health (Grépin & Dionne, 2013), maternal mortality (Shiffman & Smith, 2007), nutrition (Gillespie, 2013; Pelletier et al., 2012), agriculture (Binswanger & Deininger, 1997; Poulton, 2014) or social protection (see Haggard & Kaufman, 2008). The few existing multi-sectoral studies (e.g. Kaufman & Nelson, 2004) tend to focus on different countries, masking whether the theoretical framework or the country context explains the observed outcomes.[2]

Consequently, we apply the KM in the same country, Zambia, but to two different policy domains: agricultural input subsidies and micronutrient interventions.[3] As shown in Table 2, these two domains vary in several ways that begin to test whether the model is sufficiently robust. For example, input subsidies may impact yields within one agricultural season while the benefits of micronutrient interventions may take years to materialize. Moreover, subsidized inputs are typically a very visible intervention, distributed by governments with great fanfare. Micronutrient interventions, especially those involving food fortification, cannot be physically seen by consumers who must trust that their salt contains iodine or their flour is vitamin-enriched. In addition, input subsidy policy typically is overseen by ministries of agriculture while micronutrient interventions may require ministries of health, gender, education, and food and safety agencies (Gillespie et al., 2013). Rent-seeking is notoriously high with input subsidies due to the large amounts of money involved in securing procurement and transport contracts, the long distribution channels that create multiple opportunities for diverting inputs from intended beneficiaries, and the ability to use inputs for political gain (Banful, 2011; Dionne & Horowitz, 2016; Takeshima & Nkonya, 2014). Rent-seeking is not entirely absent from micronutrient interventions, especially if one employs Khan's (2000) broad definition of this behavior.[4] However, the prospects for such behavior are comparatively lower due to fewer opportunities for amassing large profits; for instance, micronutrient food fortification costs on average $0.20 per person, and vitamin A and zinc supplement capsules cost approximately $0.02 each (see Horton, Shekar, McDonald, Muhal, & Brooks, 2010).

Zambia provides an apt context for exploring these two food security domains. Approximately 60 percent of Zambia's population lives below the poverty line, and about half of the total population relies on the agriculture sector for their livelihoods (CSO, 2013; de la Fuente, Alejandro, & Rascón, 2015). Limited access to farming inputs has long hindered agricultural production and income growth. Likewise, malnutrition is a key challenge. Childhood stunting rates are, at 40%, higher than the African average (IFPRI, 2016) and vitamin A deficiency (VAD) affects more than 50 percent of school-aged children (IFPRI, 2014). Among the policy instruments deployed to address these problems, Zambian policy makers have introduced agricultural input subsidies and vitamin A fortification.

Zambia has a hybrid form of government that combines the Westminster tradition of parliamentary democracy with strong presidentialism (Burnell, 2003). Parliament theoretically is an oversight body that is responsible for approving the budget and enacting laws. However, because the president's party typically controls a majority in parliament, the legislature often acts as a rubber stamp for executive policies. Ministers can propose policy changes, which are subject to Cabinet approval and oversight by the Ministry of Justice. Cabinet ministers can then issue Statutory

[2] A notable exception is the work by Fabella et al. (2014), which focuses on five sectoral reforms in the Philippines.

[3] Please see Haggblade et al. (2016) and Resnick and Mason (2016) for the full-length case studies. These are available at the Food Security Policy Project website at: http://fsg.afre.msu.edu/fsp/.

[4] The sugar fortification policy debates described in this paper show how a local monopolist successfully translated micronutrient fortification requirements into a non-tariff barrier that enabled significant domestic price increases and economic rents.

Table 1
Summary of Kaleidoscope Model hypotheses and operationalization.

Policy stages	Determinants of policy change	Hypothesis	Measurement
Agenda setting	1. Recognized, relevant problem	Credible evidence of a policy problem by a concerned constituency increases public attention to finding a policy solution	Identify the constituency concerned. Identify evidence used to assess the problem and measure its significance
	2. Focusing event	A well-defined event focuses public attention on a problem or creates a window of opportunity for policy change	Identify unexpected or non-routinized events. Indicate whether and how the event attracted the attention of advocates.
	3. Powerful advocates	Strong individuals, organizations, or companies support a new or changed policy to key decision makers	List actors lobbying for policy change
Design	4. Knowledge & research	Evidence-based knowledge shapes feasible design	List existing or commissioned case studies, research, or examples that informed the design of the policy program
	5. Norms, biases, ideology & beliefs	Beliefs and biases shape the range of acceptable design features	List norms or beliefs that influenced policy design and to whom they belonged
	6. Cost-benefit calculations	Expected costs and expected benefits (political, economic, social) determine the preferred design	List particularly salient costs or benefits that influenced policy design
Adoption	7. Powerful opponents vs. proponents	• For a policy to be adopted, supporters must be relatively more powerful than opponents. • For a policy to not be adopted, opponents must be relatively more powerful than supporters	List the supporters and the opponents of the policy drawing from government, private sector, civil society, donors and other international groups. Identify their sources of influence (e.g. financial, institutional, political, electoral)
	8. Government veto players	• For a policy to be adopted, government agents with ultimate decision-making power must be supportive or neutral • For a policy to be vetoed, government agents with ultimate decision-making power must be an opponent	List government decision-makers with ultimate authority. Classify actors as proponents, opponents, or neutral. Identify if the veto player opposed reform (negative) or allowed it to proceed (positive)
	9. Propitious timing	Supporters wait for opportune moments (political, economic, social) to push policy change.	Identify if timing (political, economic, social) was leveraged to help increase the probability of program adoption. Identify the specific event and how it influenced the probability of adoption, with specific reference to when it occurred vis-a-vis the period of adoption
Implementation	10. Requisite budget	Government or donors provide fund sufficient to carry out the new policy or program as intended	Identify if funding for the program was sufficient for the new policy over time. Also note if there were periods when funding was not sufficient and the program deviated from stated intent
	11. Institutional capacity	Government, organizations, or companies were available and able to manage the new policy or program as it was intended	List the actors tasked with program implementation. Consider the following factors: 1) Did they have the human resources to implement the program as designed? 2) Did they have the capacity for monitoring and oversight? 3) Did they have the ability to engage in inter-ministerial coordination, if needed? 4) Did they have the decentralized infrastructure to do this, if needed?
	12.Implementing stage veto players	Designated implementers – from the private sector, NGO or local agencies – have both incentives and willingness to implement the policy program.	Did private sector, NGO or local agency implementers exercise discretionary power to modify or *de facto* revise the policy? Did they refuse implementation? If so, explain.
	13. Commitment of policy champions	Strong individuals, organizations, or companies continued to publicly support the program	Identify any strong proponents who acted as a watchdog to ensure the program was operating as intended
Evaluation & Reform	14. Changing information & beliefs	New learning emerges that influences how decision makers believe the policy/program should be structured	List new information or beliefs that emerged post-implementation and influenced how policymakers think programs should be structured
	15. Changing material conditions	Available resources, technology, or conditions (human, climatic, natural, market) have changed since the policy was originally designed	List changes in the policy environment (resources, problem status, technology) that influence the need for the operation of the program
	16. Institutional shifts	New actors enter the policy arena as the result of a new government coming to power, cabinet reshuffle, or new staffing	Identify key changes in policy institutions: new administration, new minister, new policy architectureWhat new perspectives and priorities did the new players bring to the policy debates?

Source: Authors' compilation.

Table 2
Variation in food security policy domains.

Characteristics of policy domain	Input subsidies	Micronutrients
Time frame to impact	Short-term	Long-term
Visibility of Response	Higher	Lower
Beneficiaries	Targeted	Dispersed
First Movers	Domestic governments	International donors
Need for Inter-Ministerial Coordination	Lower	Higher
Opportunities for rent seeking	Higher	Lower

Instruments (SIs) to change policy without review by parliament or non-state actors (see Chapoto et al., 2015).

The following two sections take advantage of this broader policymaking context to analyze drivers of change related to input subsidies and vitamin A fortification. The authors conducted semi-structured interviews with 58 knowledgeable stakeholders in Lusaka, Zambia between June–August 2015. As shown in Appendix 1, these interview respondents collectively span government ministries, the research and donor communities, civil society, and the private sector. Secondary resources, including academic articles, donor reports, parliamentary hansards, and media findings, supplemented the fieldwork.

4. A rocky road to input subsidy reform

Input subsidies for smallholder farmers have long been a cornerstone of Zambia's agricultural policy. Prior to structural adjustment, Zambia had an extensive system of inefficient agricultural subsidy programs (Deininger & Olinto, 2000). In the wake of structural adjustment in the early 1990s, currency depreciation increased the cost of importing inputs and hindered smallholder access, a fact compounded by a continued lack of private sector engagement in input markets (Kherallah et al., 2000). By the end of the 1990s, fertilizer use on crops such as maize had fallen by 40% compared to the pre-structural adjustment period (Jayne, Govereh, Mwanaumo, Nyoro, & Chapoto, 2002). Therefore, low fertilizer use constituted a recognized, relevant problem and addressing it became a primary objective of the Fertilizer Subsidy Program (FSP) that was launched in 2002. The discussion below focuses on four policy episodes: the emergence of FSP, a transition to the Farmer Input Support Program (FISP) in 2009, a failed attempt to add an electronic voucher (e-voucher) in 2013, and a successful attempt in 2015.

4.1. Re-emergence of input subsidies

The Southern African drought of 2000–2002, which reduced crop yields by 40 percent, represented a key focusing event that precipitated Zambia's return to input subsidies. In May 2001, the Zambian government declared a state of disaster to mobilize humanitarian assistance (Philipose, 2007). As seen in Table 3, the crisis also coincided with the 2001 presidential campaign. Three months after being elected with only 36 percent of the vote, Levy Mwanawasa of the MMD announced the fertilizer subsidy program in parliament, which was included in the finance minister's budget speech only two weeks later (see MoFNP, 2002). As president, Mwanawasa became a powerful advocate for the program.

Support for FSP was relatively widespread, with many apparent benefits. Mwanawasa argued that it was not only essential for addressing short-term food insecurity but also for diversifying away from dependence on copper (Cherry, 2002). The program also appealed to rural voters who had increasingly become the bastion of the MMD's support as the party lost ground in urban areas (Resnick, 2014). Simultaneously, FSP would help support the government-owned Nitrogen Chemicals of Zambia (NCZ), which was running at a loss and chosen as one of the three main companies to supply the subsidy scheme in its first year (see MoFNP, 2002). The timing of the program coincided with Zambia's qualification for debt relief funds under the Heavily Indebted Poor Country (HIPC) initiative, which became accessible in May 2002 when it finalized its Poverty Reduction Strategy Paper (MoFNP, 2002).

The program was intended to only last three years and had multiple objectives, including generating long-term demand for input use among needy smallholders, promoting savings mobilization, and increasing fertilizer demand from the private sector. Beneficiaries were limited to those growing 1–5 hectares of maize, and they received 8 bags of fertilizer and 20 kg of maize seed under the program (MACO, 2002). While the three-year sunset clause reflected a general belief in the donor community about the importance of an enabling environment, FSP's design features did not appear to emanate from any specific research or technical assessments. In fact, some of the provisions even contradicted program objectives and previous research. For instance, the decision to focus the program on maize inputs contradicted government decisions in the mid-1980s to remove distortions that encouraged overproduction of the crop (see IMF, 2002).

The initial few years of FSP implementation were characterized by poor targeting, late input deliveries, and insubstantial evidence of improved agricultural productivity (see Govereh et al., 2006). FSP began in the 2002–2003 agricultural season with 120,000 smallholders and a government subsidy of 50 percent of inputs. Instead of concluding the program in 2005, which was the original stated intention, FSP beneficiaries rose to 200,000 smallholders by the 2008–2009 season with the government subsidizing 75 percent of the inputs.[5] As observed in other countries that pursued input subsidies in the 2000s (Jayne & Rashid, 2013), Poverty Reduction Budget Support from the donor community was a key factor in funding and expanding FSP (de Kemp, Antonie, & Leiderer, 2011).

Despite having the requisite budgetary resources, FSP implementation was affected by the constrained production capacity of NCZ, failures in coordination between MoFNP and MACO, and delayed payments to input suppliers (Jorgensen & Loudjeva, 2005). In 2008, payments were so delayed that private sector fertilizer suppliers suspended the release of fertilizer stored in their depots for that agricultural season (Musonda, 2008), thereby demonstrating their role as implementation veto players. Despite these problems, the program retained a high level of political support from Mwanawasa and during the 2006/7 agricultural season, which coincided with Mwanawasa's re-election campaign, the number of FSP beneficiaries increased by almost 70 percent.

By 2008, much more information emerged about FSP's ineffectiveness. Researchers and government watchdogs provided evidence of corruption, leakage, late deliveries, high program costs, and crowding out of the private sector (Kasanga, 2008; Mason and Jayne, 2013; Mason, Jayne, & Mofya-Mukuka, 2013; Minde et al., 2008; OAG, 2006, 2008; Xu, Burke, Jayne, & Govereh, 2009). Some opposition party MPs were even pushing for FSP reform (see NAZ, 2007). This scrutiny coincided with the beginning of the global food and financial crisis, which resulted in high inflation for staples and imports, prompting the government to seek US $68 million in mid-2008 to cover additional procurement costs (Chapoto, 2015). This significantly changed material conditions on the ground, prompting MoFNP to request FSP be re-evaluated and resulting in two large stakeholder workshops in April and June

[5] Zambia's Fifth National Development Program institutionalized the subsidy program by suggesting that FSP continue until 2008 (see MoFNP, 2006).

Table 3
FSP and FISP subsidy policy chronology.

Year	Policy Events	Political Events	Economic Events	Research and other events
2001		Levy Mwanawasa (MMD) elected with 36% of the votes	• Government declares disaster in wake of droughts • Draft PRSP is finalized	
2002	• Mwanawasa announces subsidy in parliamentary speech • Input subsidy announced in budget speech • **FSP launched**	Mwanawasa inaugurated as president	• Bailout of NCZ announced • PRSP approved by World Bank and IMF	
2005			• MoU on Poverty Reduction Budget Support signed with donors • Zambia receives 100 % debt relief under Multilateral Debt Relief Initiative	CSPR Report on FSP released
2006		• Mwanawasa re-elected • Ben Kapita becomes new MACO minister	• Launch of CAADP process • Fifth National Development Plan (FNDP) finalized	Govereh et al. (2006) report on high opportunity cost of FSP spending compared with other agricultural public investments
2007	FSP contracted suppliers suspend deliveries due to delayed payments from MACO		Joint Assistance Strategy for Zambia initiated	
2008	MoFNP proposes that general subsidy replaces FSP and Cabinet asks MACO to respond	• Mwanawasa dies • Rupiah Banda (MMD) wins presidential elections • Brian Chituwo becomes new MACO minister	Price of fertilizer increases by 60% due to food and fuel price crisis	• ZNFU position paper on FSP • MACO organizes FSP stakeholder consultation • FSP Evaluation workshop by ACF-FSRP-MACO
2009	• Cabinet Committee of Ministers declare that FSP becomes FISP • **Banda announces shift from FSP to FISP in Parliament**			• Fertilizer Study Tour of Kenya, Malawi, and Tanzania led by Food Security Research Project • Zoona pioneers e-vouchers • paper on FSP crowding out private sector
2010	Small quantity of rice seed distributed through FISP	• Peter Daka becomes MACO minister	PRBS donors include e-voucher as criterion in the PAF indicators	Ministry of Community Development explores e-voucher for EFSP
2011	Traditional chiefs added as beneficiaries of FISP	• Michael Sata (PF) elected president • MACO renamed MAL and Emmanuel Chenda becomes MAL Minister	• Signing of CAADP compact • Sixth National Development Plan finalized	Jayne et al. (2011) argue for holistic strategy beyond FISP
2012	• Sorghum and groundnuts added to FISP • Min. Sichinga announces e-voucher launch	• Robert Sichinga becomes MAL minister	• WB's PRSC II indicates e-vouchers as a target condition for 2012 • Zambia issues first Eurobond for US $750 million	Number of research papers on problems with FISP and viability of e-voucher, including Mason and Jayne (2012), and Sitko et al. (2012)
2013	**Min. Sichinga tells parliament the e-voucher was not going to proceed**		Final draft of National Agricultural Investment Plan (NAIP)	Number of papers on impacts of FISP targeting (see Mason and Jayne, 2013; Mason and Ricker-Gilbert, 2013; Mofya-Mukuka et al., 2013)
2014		• Sata dies; Vice President Guy Scott becomes interim president • Wilbur Simuusa becomes MAL Minister	• Zambia issues 2nd Eurobond at US$ 1 billion • Launch of PF's Revised SNDP	• ZNFU launches prepaid Visa card system under its Lima Credit Scheme • CSOs sign proposal requesting GRZ bring back e-voucher
2015	• **Cabinet approves e-voucher** • Donors provide US$ 1.6 million to roll out e-voucher • **President Lungu launches e-voucher system**	• Edgar Lungu (PF) elected president • Given Lubinda becomes MAL minister	• Article IV consultation with IMF, which recommends e-voucher for FISP Zambia launches 3rd Eurobond for US $ 1.25 billion	Two stakeholder workshops on e-voucher

Source: Adapted from Resnick and Mason (2016).
Notes: Boldfaced text indicates whether the policy was actually adopted and implemented.

2008 (MACO, 2008). Mwanawasa, the original advocate and champion of FSP, died shortly thereafter and was replaced by his vice-president, Rupiah Banda. This combination of institutional shifts, changing information, and new material conditions collectively created the space to re-evaluate FSP and consider alternatives.

4.2. Transitioning from FSP to FISP

Despite six years of FSP, the initial relevant problem persisted, with only 30 percent of smallholders using inorganic fertilizer in the 2008/09 agricultural season (Sitko et al., 2012). The global food price crisis acted as a new focusing event by making maize and inputs more expensive for poor consumers and smallholder producers. Subsidies were not necessarily discredited, but there was a strong interest in improving their efficacy through a design reform. Donor partners funding poverty reduction budget support (PRBS) noted in early 2009 that FSP crowded out much needed rural investment programs (see Saasa, 2010: 39). MoFNP suggested a universal subsidy to reduce administrative costs associated with targeting (; MACO, 2008).

For the 2009/10 agricultural season, FSP was transformed into the Farmer Input Support Program (FISP). Like under FSP, the government continued to handle the physical procurement, transport, and distribution of inputs while suppliers were selected through a tendering process. Key design changes included the requirement that beneficiaries could farm 0.5 hectares. Input packs were reduced from eight to four bags of fertilizer and from 20 kg to 10 kg of maize seed. In subsequent years, rice, sorghum, and groundnut seeds were added to diversify away from maize. Beneficiaries were selected by Camp Agricultural Committees (CACs) rather than by the cooperatives/farmer organizations of which they were members.[6]

Reducing the number of input bags was intended to decrease leakage, which often occurred under FSP as farmers sold excess subsidized fertilizer to non-beneficiaries. These and other changes were informed by research commissioned by the government from the World Bank (World Bank, 2010) as well as a study tour for government officials to Kenya, Malawi, and Tanzania that was organized by Michigan State University's Food Security Research Project (FSRP). The tour revealed that Zambia distributed more fertilizer than neighboring countries with subsidy programs. Yet, reducing the quantity of the subsidized inputs per beneficiary required addressing deep-seated beliefs among politicians that subsidies win rural votes. Convincing President Banda therefore required emphasizing that if the number of bags per beneficiary were reduced, the number of beneficiaries could be doubled. As one stakeholder involved in the reform stated, "Policy for agriculture inputs is politically motivated. We needed to guide him [Banda] from a political angle."[7] In this way, the new design offered political benefits. Moreover, economic costs of the program were minimized due to PRBS disbursements, which peaked in 2009 (de Kemp et al., 2011). This provided confidence that MoFNP would allocate additional resources to FISP, which is labeled by the government as a poverty reduction program. By July 2009, the main government veto player, cabinet, agreed to transform FSP into FISP, and President Banda announced the reform to Parliament two months later.

Despite these changes, program implementation continued to face many constraints. Financially, FISP required a high level of budgetary resources as the subsidy rate increased to 79 percent by the 2011/12 agricultural season and grew to target almost one million beneficiaries. Between 2009 and 2011, spending on FISP was approximately one-third of all government spending on agriculture (Mofya-Mukuka, Kabwe, Kuteya, & Mason, 2013). Politicians proved committed policy champions, with spikes in the number of beneficiaries and the subsidy rate just prior to the 2011 presidential elections. In those elections, Banda was ousted by Michael Sata, who led the Patriotic Front (PF) party.

Institutional capacity again though proved a major constraint. Agricultural officers spent almost 80 percent of their time overseeing FISP rather than focusing on their extension duties (World Bank, 2010). Late fertilizer disbursements persisted due to NCZ's low capacity and late payments to private suppliers of urea fertilizer. Two private suppliers, Omnia and Nyiombo, halted supplying fertilizer in the 2012/13 season due to non-payment by the PF government, demonstrating again the veto power of implementing agents (Sayila, 2012).

Consequently, many of the same problems with FSP reappeared with FISP. Changing evidence pointed to FISP's inability to achieve its stated objectives, the crowding out of other important agricultural investments, few opportunities for strengthening the private sector, opacity in the tendering process, and late delivery of inputs (e.g. Mason et al., 2013; World Bank, 2011).

4.3. Targeting through an e-voucher

An e-voucher had long been considered a modality for improving FISP's effectiveness. E-vouchers enable farmers to go directly to agro-dealers for subsidized inputs and thereby reduces administrative costs because the government is no longer involved in transport, storage, and distribution (see ACF, 2012). The option of using e-vouchers in Zambia first became viable in 2009 through a new type of focusing event: a local start-up company known as Zoona pioneered the use of mobile payments through e-voucher scratch cards.

A broad range of powerful stakeholders advocated for incorporating these scratch cards into FISP, including the Zambia National Farmers Union (ZNFU), Conservation Farming Unit (CFU), the Agricultural Consultative Forum (ACF), and donors. In 2010 and 2011, the donors included a voucher-based input subsidy as one of two performance criteria in the Performance Assistance Framework that underpinned Zambia's PRBS assistance (World Bank, 2012). Yet, despite this convergence on e-vouchers, there was little agreement regarding the actual design. A project implemented by CFU in 2009 remunerated farmers involved in a conservation farming scheme with Zoona pre-paid mobile phone scratchcard vouchers earmarked for inputs from agro-dealers (Sibanda, 2010). In 2010, the Ministry of Community Development (MCD) began using Zoona's e-voucher scratch cards for the Expanded Food Security Pack program that it oversees (Kasanga, Daka, Chanda, & Undi, 2010). These pilot experiences, plus the study tour to Kenya, Malawi, and Tanzania organized by FSRP and a report by Sitko et al. (2012) provided insights about possible design options.

However, the e-voucher was a radical departure from how FISP had operated for more than a decade, and there were many biases about the technology. The parliamentary agricultural committee questioned whether there was sufficient infrastructure in rural areas for an e-voucher (see NAZ, 2013).[8] Others questioned the Government's ability to pay agro-dealers upfront, which is critical for an e-voucher system to work effectively.[9] In addition, bureaucrats overseeing FISP feared losing patronage benefits as a result of a more streamlined and transparent system.[10] Thus, in October

[6] CACs currently consist of cooperation/farmers organizations from each zone, traditional establishments in the camp, the church, community-based organizations, non-MAL public offices (for example, those involved in health, education, and community development), and an MAL extension officer who serves as executive secretary.

[7] Anonymous interview, Lusaka, Zambia.

[8] Interview with IAPRI, August 24, 2015.

[9] Interview with MAL, August 24, 2015, Lusaka, Zambia.

[10] This was an oft-repeated view in interviews, including with FAO, IAPRI, MAL, Ministry of Norway, and USAID.

2013, the Minister of Agriculture and Livestock (MAL) announced that an e-voucher would not precede.[11] In other words, the costs were believed to exceed the benefits of an e-voucher and powerful opponents existed within the ministry.

4.4. Emergence of the Visa card alternative

The policy dialogue gained momentum again when ZNFU launched a pre-paid Visa card platform system in August 2014 for one of their programs.[12] The Visa cards incorporated different "wallets" for seed, fertilizer, livestock feed, and herbicides. Instead of relying on mobile phones, the Visa card relies on point of sale machines made available to agro-dealers.[13] ZNFU framed the Visa scheme as "catalytic," generating the belief that the modality could address multiple goals simultaneously, such as increased private sector competition, improved access to banking, and a mechanism for ultimately linking all of Zambia's social welfare programs in one card.[14] After Edgar Lungu from the PF became president in the wake of Sata's death in late 2014, ZNFU provided Lungu's new MAL minister, Given Lubinda, more details on their Visa platform.[15] Subsequently, MAL co-hosted two stakeholder consultations in mid-2015 to discuss a Visa-based e-voucher (Mate, 2015), increasing knowledge about this approach. A set of donors committed to supporting the e-voucher if it was ultimately adopted, thereby minimizing economic costs.[16] With additional time to review progress with existing e-voucher modalities, an opportunity to witness the initial pilot of the ZNFU Visa model, and promised donor support, the benefits and viability of an e-voucher became more apparent. Moreover, powerful MAL bureaucrats who previously blocked the e-voucher left MAL in 2014, removing an additional barrier to change.[17]

In May 2015, the Zambian Cabinet approved MAL's proposal to pilot the e-voucher based on the Visa platform. Presidential support is necessary for any policy to be approved at Cabinet level, and the PF had long advocated improved targeting of FISP (see PF manifesto, 2011; MoFNP, 2014). As one informant observed, "The president hasn't intervened because everyone now 'gets it' because at end of the day, he [Lungu] doesn't get any mileage out of opposing this, and everyone in the districts are complaining about elite capture."[18] Thus, the e-voucher was adopted with sufficient time to be effective for the 2015/2016 agricultural season. MoFNP had also long advocated for an e-voucher to reduce the cost of the program.[19]

Since the e-voucher allows multiple fertilizer companies to participate and increases transparency in procurement, the opponents to the e-voucher were the major fertilizer importers who stood to lose out on their favored position in the traditional FISP program.[20] Seed companies were less resistant because they already had more developed distribution systems with agro-dealers than fertilizer suppliers (Sitko et al., 2012). Fig. 2 uses a circle of influence graphic to demonstrate changing stakeholder positions on the e-voucher over time.

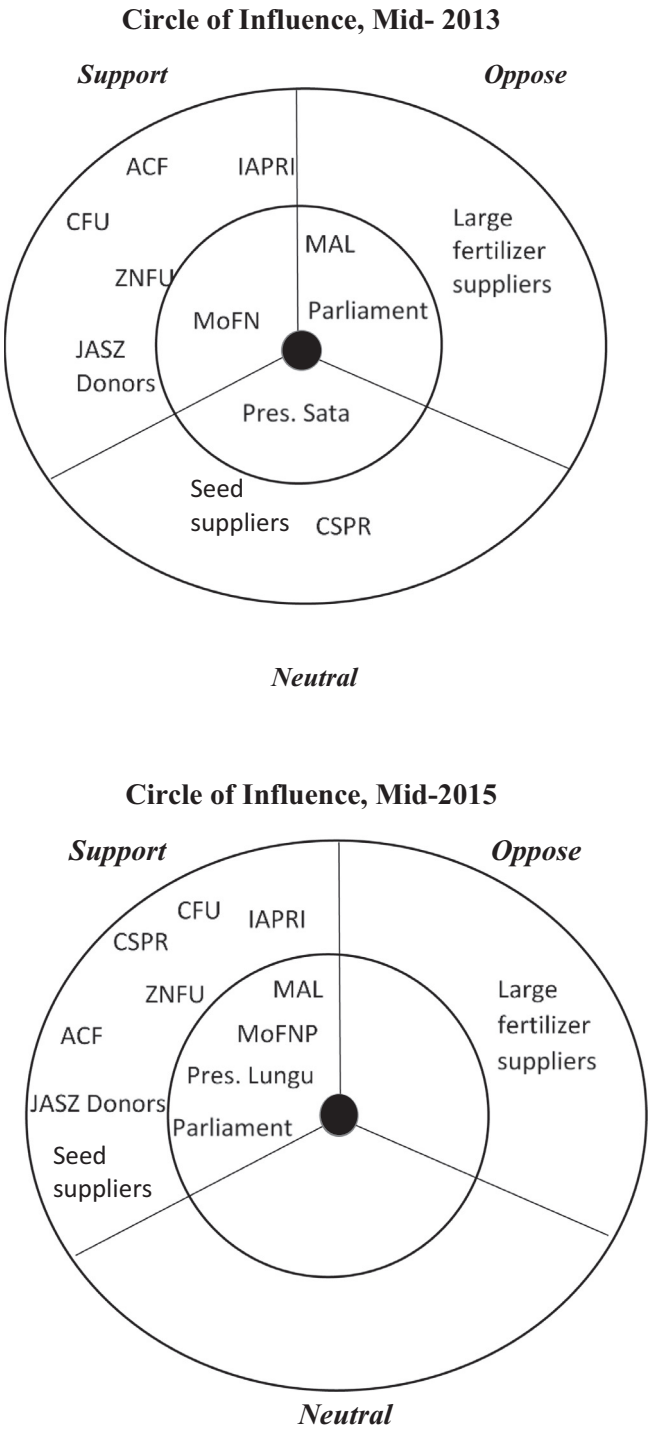

Fig. 2. FISP e-voucher reform, changing circles of influence.

President Lungu launched the e-voucher pilot in October 2015 in 13 districts. Eligible farmers received a pre-paid Visa chip card pre-loaded with approximately US $170, and they had to make a personal contribution of around US$40 before their cards were activated.[21] Beneficiaries can use the cards to purchase fertilizer, seed, herbicide, insecticide, fungicide, livestock feed, and veterinary drugs at participating agro-dealers (MAL, 2015). When registering

[11] Until 2009, MAL was named the Ministry of Agricultural and Cooperatives (MACO). To avoid confusion, we refer to MAL throughout, even prior to 2009.

[12] The Lima scheme, which began in 2008, aims to improve the financial inclusion of farmers by providing a credit guarantee covering 50 percent of the cost of conservation agriculture inputs to cover between 1 and 5 hectares (FAO, 2011).

[13] Interview with ZNFU and MoFNP, August 28, 2015, Lusaka, Zambia. With point of sale machines, the banks earn money every time the Visa card is swiped so they have incentive to distribute as many machines as possible.

[14] Interview with ZNFU, August 28, 2015, Lusaka, Zambia.

[15] Interview with ZNFU, August 28, 2015, Lusaka, Zambia.

[16] These included the European Union, SIDA, Finland, DfID, the African Development Bank, and USAID.

[17] Interview with MAL, August 24, 2015, Lusaka, Zambia.

[18] Interview with MoFNP, August 28, 2015, Lusaka, Zambia.

[19] Ibid.

[20] Interview with Omnia, August 28, 2015, Lusaka, Zambia.

[21] This is based on 2016 exchange rates.

for their card, the coordinates of the farmer's land plot were verified to ensure that recipients are indeed smallholders.

Upholding their commitments, donors provided US $1.6 million for key elements of implementation.[22] Implementing the e-voucher drew on the existing institutional architecture for FISP, including CACs, district agricultural committees (DACs), and Provincial Agricultural Coordinator's Offices. ZNFU printed the cards, engaged with the banks, and worked with the DACs to distribute the cards to beneficiaries (MAL, 2015). There were some weaknesses in institutional capacity, as witnessed by the late submission of beneficiary names in certain districts (NAZ, 2016). Moreover, the two selected banks for the program were overwhelmed with producing so many Visa cards, requiring MAL to involve a third bank.

Initial evaluations by researchers revealed that key weaknesses included poor sensitization of farmers who did not fully understand the system and slow activation of the Visa cards (see Kuteya, Lukama, Chapoto, & Malata, 2016; Mbebwe, 2015). However, approximately 20,000 "ghost farmers" were uncovered through the plot registration process, and FISP was more appropriately targeted (see Kuteya et al., 2016). The PF's party manifesto for the 2016 elections claimed credit for improving transparency in the program (see PF manifesto, 2016: 26). Despite Lubinda's departure from MAL in 2016, Cabinet approved scaling up the pilot for 2016/2017 to 39 districts (Mwale, 2015), and the EU pledged significant resources for the expanded e-voucher, providing a positive shift in material conditions for financing the program (Bwalya, 2016).

5. Vitamin A fortification: why sugar and not maize meal?

Just as soil nutrient deficiencies concern agricultural policy makers, human micronutrient deficiencies, particularly in iodine, iron, and vitamin A, have pre-occupied public health specialists in Zambia (Horton, Alderman, & Rivera, 2008; MOH, 2005). Zambia's micronutrient policy covers a range of micro-nutrients and delivery mechanisms, including government-supplied supplements for vulnerable groups, food fortification mandates implemented by private sector agribusiness firms, and bio-fortification of vitamin A rich sweet potatoes and maize. The discussion below focuses on a subset of these, including four vitamin A fortification reform episodes, one that came to fruition and three that failed.[23]

5.1. Aborted efforts to fortify maize meal (1996)

Medical researchers in Zambia have recognized for many decades the serious health risks posed by vitamin A deficiency, a critical problem affecting the population (NFNC, 2005; TDRC, 2015). Internationally, the UNICEF World Summit for Children held at the UN in 1990 became an important focusing event that stimulated large-scale efforts to combat vitamin A deficiency (Horton et al., 2008). Consequently, large-scale donor resources became available in the early 1990s to promote vitamin A programs, which is when Zambia's efforts began.

As the policy chronology in Table 4 reveals, Zambia's nutrition policy makers have tried multiple times to mandate maize meal fortification as part of their broader efforts to promote increased consumption of vitamin A and other micro-nutrients. In the mid-1990s, concerns about low coverage of vitamin A supplementation through capsules distributed at clinics and schools motivated a series of complementary efforts to fortify various foods with vitamin A. In May 1996, key domestic and international advocates, including the National Food and Nutrition Commission (NFNC) and UNICEF, respectively, hosted a workshop to draw on existing research and identify options for vitamin A fortification of staple foods. Initially, the workshop focused on maize meal, the country's major staple, as the most promising vehicle for fortification. However, several major millers objected that mandatory fortification would increase their production costs, affect taste, and place them at a competitive disadvantage compared to Zambia's thousands of small hammermills where enforcement would prove problematic. Since costs outweighed benefits for a critical constituency, this initial maize meal fortification effort failed at the design stage.

5.2. Sugar fortification mandate (1998)

The NFNC subsequently sought alternate design options for vitamin A fortification (Serlemitsos & Fuscos, 2001). In October 1996, the NFNC Fortification Task Force (FTF) visited Zambia Sugar, which was then Zambia's sole sugar producer and struggling to regain profitability after being recently privatized. USAID also brought in a fortification consultant and financed a Zambian team to visit Guatemala to gain knowledge about sugar fortification efforts there. Before ultimately agreeing to implement a sugar fortification mandate, Zambia Sugar imposed several conditions to minimize the costs of their involvement. From donors, they requested funding for initial equipment purchases, a one-year supply of fortificants, staff training and public education campaigns. From the government, they demanded a ban on imports of unfortified sugar, which at the time accounted for between 10% and 25% of national sugar consumption. Since no countries in the region fortified sugar at the time, this requirement effectively banned the sale of imported sugar in Zambia (Serlemitsos & Fuscos, 2001). Following these agreements, in December 1998, the Minister of Health (MoH) issued Statutory Instrument 155 mandating fortification of all household sugar sold in Zambia.

The early implementation years proved tense and contentious. Some of the equipment promised by donors failed to arrive on time. Given the severe cash-flow problems associated with privatization, Zambia Sugar's requisite budgetary resources were limited. The company nonetheless continued fortification but requested an additional $1 million from USAID to cover the cost of fortificants, a request which USAID rejected citing their prior provision of equipment, chemicals, and training (Serelemitsos & Fusco, 2001:11). Zambia Sugar likewise claimed that the donors failed to provide adequate publicity for the new fortified sugar. Most importantly, the company complained about continued widespread smuggling of unfortified sugar imports into Zambia from surrounding countries. The government responded with stricter border controls, while USAID's micronutrient program (MOST) provided training for health inspectors and testing laboratories.

Although testing of fortification levels in retail and household sugar samples proved erratic since the imposition of the vitamin A mandate, the few tests conducted have all found that a majority of samples fell below the mandated fortification level of 10 mg/kg (see Haggblade et al., 2016).[24] The most extensive of these testing efforts, the national VAD survey of 2003, found only 18% of household sugar samples above the minimum required 10 mg/kg (NFNC, 2005). Due to this changing information, our stakeholder interviews and most major reviews of Zambia's vitamin A sugar fortification

[22] These elements included Visa Card production, farmer registration, beneficiary selection, agro-dealer selection and training, and an online database for system management. Personal communication with EU delegation, September 2015.

[23] See Haggblade et al. (2016) for a review of the full range of micro-nutrient policies and their key drivers in Zambia.

[24] Haggblade et al. (2016, p.33) report available test results conducted by the Food and Drugs Control Laboratory (FDCL) in 1998, by USAID's MOST project in 2000, by the vitamin A deficiency survey (VAD) team in 2003, and by FDCL in 2006 and 2011.

Table 4
Vitamin A policy chronology.

Date	Policy events	Political events	Economic events	Research and other events
1990	• MOH begins VA supplementation	• UNICEF World Summit on Children: UN General Assembly resolution		
1993	• NFNC establishes Micronutrient Task Force			
1995			• Zambia Sugar privatized • Tate and Lyle purchase Zambia Sugar	
1996	• **Maize meal fortification fails: implementing stage veto player refuses**		• NFNC convenes vitamin A workshop with private sector; suggests maize meal fortification first, but millers object	• DHS survey finds 68% VAD
1997			• Zambia Sugar expresses willingness to fortify sugar; requests $1 million in donor funding for equipment and one-year supply of fortificant	• National survey on VAD (NFNC, 1997) • USAID funds visit by Dr. Omar Dary, a specialist with experience in Guatemala, to examine prospects for sugar fortification in Zambia • USAID provides $250,000 in equipment, chemicals and training
1998	• **Sugar fortification mandated: SI 155** • GOZ bans imports of unfortified sugar			• FTF members visit Guatemala to investigate sugar fortification
1999	• MOH agrees to improve enforcement of import ban on unfortified sugar • VA supplementation expanded to a national campaign with biannual mega-doses delivered through CHW campaigns	• Zambia Sugar threatens to discontinue fortification if illegal sugar imports continue • Kalungwishi Estate begins commercial sugar production, with under 1% market share		
2000	• MOH begins enforcement of sugar fortification mandate • NFNC establishes Sugar Fortification Technical Committee • NFNC expresses concern about advertising sugar as a « healthy » product	• OAU summit Roll Back Malaria	• Zambia Sugar complains that Kalungwisihi Sugar's fortificant does not comply with fortification regulations	• UNICEF supports testing and enforcement of sugar fortification • USAID MOST project sponsors training workshop for VA inspectors
2001			• Ilovo, a South African company, purchases Zambia Sugar • Widespread smuggling of unfortified sugar from surrounding countries accounts for 10% to 25% of national consumption • ZNFU and Zambia Sugar protest lack of controls on sugar imports	• CIP launches its Vitamin A for Africa (VITAA) partnership among sweet potato breeders in Eastern and Southern Africa
2003	• ZARI releases 2 light orange sweet potato varieties		• Kafue Sugar enters sugar market as 3rd producer with 7% market share	• National survey on VAD (MOST, UNICEF, CDC, NFNC, 2005)
2004	• NFNC requests GAIN support to design maize meal fortification		• Large maize millers test fortification and agree to cooperate	• Global Alliance for Improving Nutrition (GAIN) provides training, equipment and premix for maize meal fortification
2006	• ZABS works with fortification task force and industry to prepares standards for maize meal fortification • **Maize meal fortification fails: government veto player intervenes**	• Office of the President orders MOH and ZABS to stop preparing maize meal fortification standards	• British Foods buys controlling interest in Ilovo, and hence in Zambia Sugar • CCPC investigates complaints of high sugar prices by large sugar users	• GAIN comes to Zambia to help NFNC promote maize meal fortification with vitamin mineral multi-mix
2007				• HarvestPlus approaches ZARI about breeding vitamin A rich maize • ZARI begins breeding for vitamin A traits in maize, using varieties supplied by CIMMYT through HarvestPlus

Table 4 (*continued*)

Date	Policy events	Political events	Economic events	Research and other events
2008			• Sugar prices spike by 150%, triggering widespread public awareness of high domestic sugar prices	
2009	• **Sugar fortification reform effort fails: government veto players refuse parliamentary review request**	• Parliamentary Committee on Economic and Labour Affairs calls for policy change (dropping vitamin A fortification mandate) to improve sugar market competition		• NFNC defends fortification policy publicly (Lusaka Times, 2009)
2010				• ODI study of oligopoly in Zambian sugar market concludes that oligopoly combined with lack of import competition enables excessively high domestic sugar prices (Ellis et al., 2010)
2011				• ZARI submits 4 varieties of bio-fortified sweet potatoes for SCCI review
2012	• ZARI releases 3 varieties of bio-fortified "orange" maize			• ACF regional study concludes that Zambia Sugar exerts monopoly power to raise sugar prices (Chisanga, Gathiaka et al., 2014) • UNZA study concludes that sugar fortification mandate constitutes a non-tariff barrier, reduces competition and enables local sugar oligopoly to charge high prices for sugar (Kalinda & Chisanga, 2012)
2013		• President's Office phones ZARI to ask if orange maize is GMO		• UNICEF hires fortification consultant to explore maize meal fortification for a third time • given prior concerns, the consultant recommends voluntary fortification
2014		• CCPC indicates that lack of competition leads to excessively high sugar prices (Chanda, 2014)		• IAPRI study concludes that sugar fortification limits imports, enabling local sugar producers to charge excessively high prices (Chisanga, Gathiaka et al., 2014) • CUTS study examines reasons for Zambia's high sugar prices (CUTS, 2014a) • NFNC convenes breakfast briefing session to discuss sugar pricing and VAD; defends sugar fortification policy to the press (Chanda, 2014)
2015	• ZARI releases 4 varieties of orange fleshed sweet potatoes			

Source: Adapted from Haggblade et al. (2016).
Notes: Boldfaced text indicates whether the policy was actually adopted and implemented.

policy expressed concern about low fortification levels in household sugar and weaknesses in the monitoring system. These concerns have triggered reflection among public health specialists and motivated reform efforts, such as those initiated by Parliament in 2009.[25]

5.3. Aborted efforts to fortify maize meal (2006)

Due to continued high levels of VAD documented by Zambia's 2003 monitoring survey, NFNC resumed its efforts to fortify maize meal, the country's staple food. Given their prior failure to gain industry support for maize meal fortification, NFNC enlisted a powerful outside advocate, namely the Global Alliance for Improving Nutrition (GAIN). In 2004, GAIN agreed to help design, test and market a maize meal fortification standard for Zambia. GAIN provided funding for equipment and premix stocks for 30 millers as well as technical support and training. The project brought back the same consultant who had worked successfully on sugar fortification to work with the local maize industry. Domestically, NFNC launched a Food Fortification Alliance, including key ministries as well as large maize millers, despite their initial objections. Sensory trials coupled with GAIN's financial and technical support ultimately led the large millers to cooperate (Madamombe, 2007). As required by law, Zambia's Bureau of Standards (ZABS) established a standards review committee, including the millers, to formally set fortification requirements. The ZABS technical committee completed its review and prepared the proposed standards and testing procedures for public review and final adoption.

At the last minute, in late 2006, the President's Office intervened, instructing MoH and ZABS to stop all work on the maize meal fortification standards. Stakeholders cited three sets of beliefs raised by political leaders against introducing mandatory maize meal fortification standards in 2006. First, politicians worried about the risk of poisoning given that fortificants would be imported from outside of Zambia. Secondly, they feared that mandatory standards would prevent emergency imports of maize meal from outside of Zambia during drought years. Thirdly, they raised concerns about rumors of a possible impact on human fertility. In short, the maize meal fortification proposal became highly politicized. Even today, Zambia's nutrition and milling communities remain puzzled about why their political leaders intervened to stop this proposed mandate while continuing to endorse other forms of mandatory vitamin A fortification with imported fortificants.

5.4. Failed sugar fortification reform (2009)

Beginning in 2006, consumer groups began complaining about Zambia's high sugar prices and advocating for reform. Initially, several large commercial sugar users (confectionary and brewing companies) complained to Zambia's Competition and Consumer Protection Commission (CCPC) about Zambia's rising sugar prices (Chanda, 2014; Ellis et al., 2010). A second major complaint emerged following a key focusing event, namely the doubling of sugar prices in 2008 after large-scale flooding in the cane fields (Chisanga, Gathiaka, Nguruse, Onyancha, Vilakazi, 2014). More recently, in 2014, high sugar prices again made the news following publication of a sugar market scoping study by the Consumer Unity Trust Society (CUTS, 2014a).

In response, a series of empirical studies examined Zambia's sugar industry and possible explanations for Zambia's high domestic sugar price. These studies generally agree that Zambia's domestic sugar prices frequently exceed those in neighboring countries (Chisanga, Gathiaka et al., 2014; CUTS, 2014a,b; Ellis et al., 2010). Evidence also suggests that the cost of fortification, at only 1% of production costs, cannot explain the price differential (Serlemitsos & Fuscos, 2001).

Disagreement centers on other possible explanations for Zambia's high sugar prices. On the one hand, Zambia Sugar maintains that high sugar prices stem from the high cost of doing business in Zambia, where they face high value-added taxes and high labor and electricity costs. In contrast, most independent research concludes that high sugar prices result from the monopolistic structure of Zambia's domestic sugar industry coupled with an absence of price competition from imports (Chisanga, Meyer, Winter-Nelson, & Sitko, 2014; Chisanga, Gathiaka et al., 2014; Ellis et al., 2010). Structurally, Zambia's sugar industry resembles a classic monopoly since Zambia Sugar holds a 92 percent market share and exports 60 percent of national production (Kalinda & Chisanga, 2014). One study summarizes the situation as follows: "Zambia Sugar has embraced fortification, which has also served to control the influx of cheap imported sugar to the Zambian market .... millers, wholesalers and retailers are probably overpricing sugar in the domestic market despite having comparative advantage and surplus production" (Chisanga, Gathiaka et al., 2014: 19–20).

In 2009, Zambia's parliament responded to repeated consumer complaints. Their Committee on Economic and Labour Affairs requested that the MoH consider changes to government's vitamin A fortification policy in order to foster competition in Zambia's sugar industry and lower prices. Despite the concerns raised by consumer advocates and parliament, the NFNC has continued to staunchly defend the vitamin A fortification mandate in public statements (Chanda, 2014; Lusaka Times, 2009). However, in private, many nutrition and public health specialists expressed concern about the efficacy of the sugar fortification mandate, given the low reported vitamin A levels in household sugar and possible exclusion of vulnerable groups as a result of Zambia's high sugar prices. A regional study summarizes this tension as follows:

> The government argues that a large part of the Zambian population suffers from vitamin A deficiency, and since sugar is a staple commodity, it is a good medium through which to provide vitamin A to the people. However, many stakeholders outside the Government and the sugar industry consider fortification to be a mechanism for protecting the Zambian sugar market from foreign competition.
>
> [Ellis et al., 2010: 5]

Throughout these ongoing debates, powerful vested interests allied with Zambia Sugar lobbied successfully to stifle reform efforts. Ultimately, MoH and NFNC rejected Parliament's request, asserting that they would continue to enforce the vitamin A sugar fortification mandate in light of persistently high levels of VAD (Lusaka Times, 2009).

Fig. 3 uses a circle of influence graphic to map the shifting positions of stakeholders involved in policy debates over mandatory vitamin A fortification of sugar. Unlike input e-vouchers, where opposition became smaller over time, changing research and information has generated growing opposition to sugar as the vehicle for vitamin A fortification. Nonetheless, with many powerful proponents, including the sugar industry, MoH, NFNC, and key donors, modification of this policy mandate has proven impossible.

6. Discussion

Our comparative case studies allow for testing the KM hypotheses across two different policy domains and multiple policy reform cycles. Table 5 summarizes the resulting eight policy reform epi-

[25] Nonetheless, Zambia Sugar's quality control team indicates that they test every batch of sugar hourly at their mill to ensure that all shipments from the mill meet regulation vitamin A levels. While vitamin A fortificants in sugar are relatively stable under most conditions, they can differ from the point of the mill to the point of consumption often due to poor mixing at the mill.

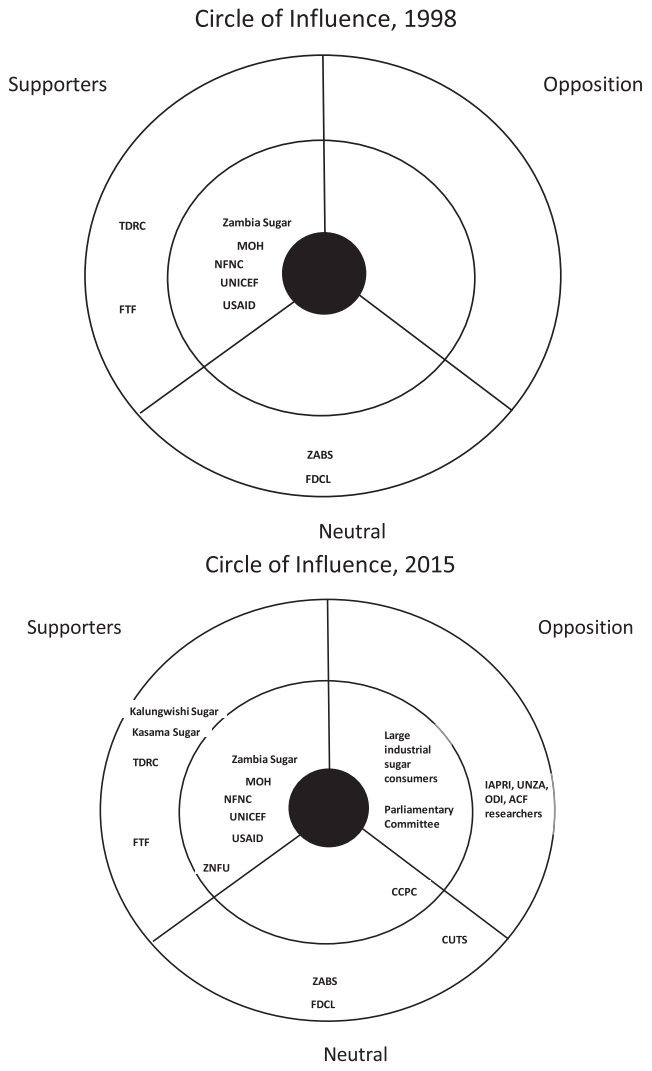

Fig. 3. Vitamin A fortification of sugar, changing circles of influence.

sodes relevant to ISPs and vitamin A fortification.[26] If the hypothesized variable was present and if key informants believe it significantly influenced an outcome, we use a positive sign to indicate that the variable facilitated reform as intended, a negative sign if it hindered the intended policy reform, and a naught sign if the variable was present but exerted no clear influence on the policy process.

The findings provide a number of insights related to food security policy processes in general and the KM in particular. At the agenda setting stage, recognized relevant problems (H1) and powerful advocates (H3) proved uniformly important across both policy domains. However, focusing events (H2) emerged as more idiosyncratic, particularly in the micronutrient policy reforms. Although UNICEF's 1990 World Summit for Children proved important at first in drawing attention to VAD in Zambia and expanding donor resources, focusing events were less clearly identifiable in triggering subsequent attempts at policy reform, including efforts to fortify sugar in 1998 or maize meal in 2006. Sources of advocacy differed as well across the two policy domains. Domestic advocates largely drove initial agenda setting for input subsidies. In contrast, a coalition of international donors and domestic public health advocates placed micronutrient fortification on the policy agenda in Zambia beginning in the early 1990s.

In terms of policy design, research and knowledge (H4) as well as assessments of costs and benefits (H6) proved consistently important across policy domains. Yet, the weight and sources of that research and knowledge varied. At the outset, international evidence on best practice was critical for motivating options on vitamin A interventions. Research and knowledge, including that provided via diffusion from Zambia's regional neighbors, played a less substantive role for the initial design of FSP but proved more prominent in informing minor policy changes, including the transition to FISP and an e-voucher. The largest difference across the two policy domains emerged in the influence of norms and ideology (H5). The input subsidy programs uniformly depended on core beliefs about the effectiveness of market delivery systems and the government's role in agricultural input supply. These beliefs changed once a major breakthrough occurred in the country, i.e. the availability in rural areas of Visa e-voucher technology. Biases and beliefs emerged only once among the micronutrient policy reforms: when widespread rumors about potential harm to human fertility thwarted vitamin A fortification of maize meal.

The weight of powerful proponents over opponents (H7) and government veto players (H8) proved consistently important in explaining whether policy adoption occurred or not. However, propitious timing (H9) was less relevant. In only two of four instances did we find reformers explicitly waiting for an opportune moment to promote policy reform. Differing decisions in the sugar and maize meal fortification initiatives illustrate the importance of various veto players in the public (H8) and private sector (H12), as well as the linkages that frequently emerge between policy stages. While private millers squashed early efforts to fortify maize meal in 1996, political leaders blocked the second effort in 2006. The failure of parliament's request to reform the sugar fortification mandate in 2009 underlines the power of Zambia's strong presidency and the weakness of the legislature in both budgetary and policy matters.

At the implementation stage, all hypothesized variables mattered: budgetary resources (H10), institutional capacity (H11), implementation veto players, (H12), and the commitment of policy champions (H13). Donors in particular played a major role in shaping implementation. Donors provided budgetary resources (H10) as well as project-based institutional capacity support (H11) for fortification efforts. For ISPs, delayed donor disbursements and the attendant effects on budgetary resources often had spillover impacts on implementing veto players, such as fertilizer importers, who could delay ISP distribution. A similar pattern was observed during the initial stages of sugar fortification. In a country with reduced but still high aid dependence, multidonor support directly supplemented Zambia's budget for the e-vouchers and indirectly for FSP and FISP through HIPC debt relief and PRBS.

Both changing information (H14) and material conditions (H15) contributed to evaluations of the policies discussed here and a consideration of alternatives. Substantial evidence revealed the failures of FSP and FISP to raise agricultural productivity or strengthen the private sector. Likewise, laboratory tests uncovered stubbornly high VAD levels and low fortification levels of market and household sugar. This was coupled with a surge of sugar prices and the rising costs of FSP and FISP. By contrast, institutional shifts (H16) proved decisive in only half of the reform episodes.

The Zambian case studies suggest at least three distinctive features of food security policy. First, the private sector plays a critical

[26] A detailed summary of the published documentation and interview evidence applied in testing each of the KM hypotheses are available on request from the authors.

Table 5
Hypothesis testing table for Zambia cases.

Policy stages	Determinants of policy change	Input subsidy design modalities				Vitamin A fortification proposals				Total
		FSP	FISP	E-voucher scratch-card	E-voucher Visa card	Maize meal	Sugar	Maize meal	Sugar	Instances variable was present (percent)
		2002 Imple-mented	2009 Imple-mented	2013 Stalled	2015 Imple-mented	1996 Vetoed	1998 Imple-mented	2006 Vetoed	2009 Reform stalled	
Agenda setting	1. Recognized, relevant problem	+	+	+	+	+	+	+	+	100%
	2. Focusing event	+	+	+	+	+			+	75%
	3. Powerful advocacy coalitions	+	+	+	+	+	+	+	+	100%
Design	4. Knowledge & research		+	+	+	+	+	+	+	88%
	5. Norms, biases, ideology and beliefs	+	+	–	+			–		63%
	6. Cost-benefit calculations	+	+	–	+	–	+	+		88%
Adoption	7. Powerful proponents vs. opponents	+	+	–	0	–	+	–	–	88%
	8. Government veto players	+	+		+		+	–	–	100%
	9. Propitious timing	+			+					33%
Implementation	10. Requisite budget	+	+		+		–			100%
	11. Institutional capacity	–	–		+		–			100%
	12.Implementing stage veto players	–	–		+		+			100%
	13. Commitment of policy champions	+	+		+		+			100%
Evaluation & Reform	14. Changing information and beliefs	–	–		+		–			100%
	15. Changing material conditions	–	–		+		–			100%
	16. Institutional shifts	–	0				–			50%

Source: Authors' compilation. Adapted from Resnick and Mason (2016) and Haggblade et al. (2016).
Notes: A positive (+) sign indicates that the variable was present in the cases and played a role in the reform proceeding as intended. A negative (–) sign indicates that the variable was present but played a negative role in the reform proceeding as intended. A naught (0) indicates that while the variable was present, it did not affect the reform moving forward. Empty cells indicate that the variables was not present in the cases. Finally, grey boxes indicate that those variables were never relevant since the policy reform never proceeded to that stage of the process. The final column tabulates the share of cases where the variable was present and seemed to exert an influence over policy change, either positively or negatively. The denominator is the full set of episodes that proceeded to that stage of the policy process.

role, whether in delivering subsidized agricultural inputs through private agro-dealers or vitamin A-enhanced diets through fortified foods. Due to this engagement, private sector agents often influenced debates early in the policy process and in some cases exercised effective veto power at the implementation stage. Analytically, this suggests that traditional, government-centric models of the policy process in the developing world need to consider the potentially expansive role of non-government entities in the policy process.

Secondly, donors continue to play an extensive role in shaping the structure and outcomes of developing country policy systems. The case studies document donor influence on policy outcomes through multiple conduits, including by raising public awareness of specific problems, financing major global initiatives and conferences which serve as focusing events, influencing design options, and shaping cost-benefit calculations. Through the research they fund, donors become active agenda setters, designers and monitors of policy outcomes. In some cases, donors even become *de facto* veto players when implementation requires significant and consistent donor funding or technical assistance. Yet, as seen in the four cases where policy change stalled at either the design or adoption stage, donor engagement is not enough when there are powerful opponents to reform among the political elite for either ideological or material reasons.

Lastly, we found that policy change occurred more frequently for ISPs than for micronutrients; in three of the four VAD reform efforts, change was thwarted by political and business elites. This confirms what others have observed about the challenge of generating political will and commitment around both a problem (e.g. micronutrient deficiencies) and one type of solution (e.g. food fortification) that is difficult for the general public to discern and to lobby for in the short-term (Gillespie et al., 2013; Gillespie, 2014).

7. Contributions and conclusions

Practical and analytical interest in the drivers of policy change has generated fruitful scholarship over the past half-century. Collectively, this body of research suggests that policy processes are much more complex, non-linear, and iterative than originally elaborated in the early phases of research in the public policy tradition. Yet, the field remains highly fragmented, leading to critiques about vague measurement, a lack of external validity, and a failure to pursue knowledge accumulation (see Cairney & Heikkila, 2014; Goodin et al., 2006; Smith & Larimer, 2017). In contrast to the academic literature on policy processes, there are relatively narrow perspectives on drivers of policy change pursued by donors either implicitly through interventions on the ground or explicitly articulated in political economy frameworks linked to specific programmatic or sectoral interventions (see Eaton et al., 2010; Fritz et al., 2014). The Kaleidoscope Model consolidates this broad set of scholarly work and donor experience to distill 16 core drivers of policy change and orients their proximate influence in a tractable and testable framework. In doing so, the model identifies complementarities across different disciplines that often analyze policy processes from distinct perspectives, thereby marrying the importance of interests, ideas, institutions, and power that are collectively emphasized in disparate political economy, public policy, and political science literatures.

Three main contributions emerge from this work. First, we elaborate core hypotheses, definitions and measurement protocols that allow replication of the framework and comparison of outcomes across settings (see Table 1). By highlighting key contextual and human agency factors that drive policy trajectories, the Kaleidoscope Model can serve to strengthen comparative work and knowledge accumulation over time. Secondly, we present three simple analytical tools to assist researchers and practitioners. Policy chronologies, circle of influence graphics, and hypothesis testing tables respectively facilitate in-depth tracking of the sequence of events that precede a policy change, orient stakeholder policy positions vis-à-vis government veto players, and consolidate results to provide a full picture of the presence or absence of the 16 drivers of change. Thirdly, the KM can guide policy engagement activities by highlighting which actions may generate the greatest likelihood of policy change. For instance, the importance of credible empirical evidence emerged in multiple stages in the Zambian cases by documenting relevant problems (H1), contributing to design options (H4) and changing information and beliefs (H14). Moreover, we show that stakeholders may alternatively be initial policy advocates who set the agenda (H3), emerge into proponents as design options materialize (H7), or prove long-term policy champions (H13) that persevere even as implementation problems emerge. Recognizing that diverse stakeholders play differential roles throughout the life of a policy helps practitioners understand whose support needs to be elicited and when.

As with the introduction of any conceptual framework, more empirical investigation is needed to refine the model and observe its limitations. Progress towards this goal is already underway; besides Zambia, the KM also has been applied to food security policies in Ghana, Malawi, Nigeria, South Africa and Tanzania.[27] We hope that, using the tools provided here, others may further apply and test the KM to systematically advance our knowledge about common drivers of change in disparate country settings and policy domains.

Conflict of interest

None.

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Appendix 1

see Appendix 1

[27] Please see: Babu, Haggblade, Mkandawire, Nankhuni, and Hendriks (2016), Haggblade et al. (2016), Hendriks et al. (2016), Mather and Ndyetabula (2016), Resnick and Mason (2016), Resnick and Mather (2015), and Resnick and Okumo (2017). These are all available at the Food Security Policy Project website at: http://fsg.afre.msu.edu/fsp.

Appendix 1
Institutional Affiliations of Interviewees

Category	Agricultural Input Subsidies	Vitamin A Fortification
Government	• Ministry of Agriculture and Livestock (MAL) o *Deputy Ministry* o *Policy and Planning Department* o *FISP Implementation Office* o *District Agricultural Coordinator Office, Lusaka District* • Ministry of Finance and National Planning (MoFNP) o *Economic Forecasting and Modeling Unit* • Parliamentary Agricultural Committee	• Ministry of Health (MOH) • Ministry of Community Development, Mother and Child Health (MCDMCH) • National Food and Nutrition Commission (NFNC) • Food and Drugs Control Laboratory (FDCL) • Zambia Bureau of Standards (ZABS)
Research & Advocacy	• Indaba Agricultural Policy Research Institute (IAPRI) • Agricultural Consultative Forum (ACF)	• Indaba Agricultural Policy Research Institute (IAPRI) • University of Zambia (UNZA) • Tropical Diseases Research Centre (TDRC) • Zambia Agricultural Research Institute (ZARI)
Civil Society	• Civil Society for Poverty Reduction (CSPR) • Zambian National Farmers' Union (ZNFU) • National Union of Small Scale Farmers of Zambia (NUSSFZ)	• CARE International • Civil Society Scaling Up Nutrition (CSO-SUN) • Nutrition Association of Zambia (NAZ) • Competition and Consumer Protection Commission (CCPC) • Consumer Union Trust Society International (CUTS)
Private Sector	• Grain Traders' Association of Zambia • Zambian Fertilizers' Association • Omnia Fertilizer Zambia	• Zambia Sugar • Miller's Association of Zambia (MAZ) • Individual millers
Donors	• USAID • Royal Norwegian Embassy • Food and Agriculture Organization • European Union • World Bank	• USAID • UNICEF

Source: Authors' compilation.

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