Effects if Fertilizer Subsidies in Zambia: A Literature Review

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Abstract

Fertilizer subsidies are again part of the policy agenda in Sub-Saharan Africa since the 1990s. Governments spend large shares of their agricultural budgets and their means to fight poverty on such programmes, but economists formulated doubts whether these investments will pay off. This paper reviews the existing literature on effects of fertilizer subsidies in Zambia, presents an analytical framework on input subsidies and compares the empirical evidence to the goals of the fertilizer subsidy. Major findings are that the subsidy programme has failed to substantially reduce poverty and to improve food security via decreased maize prices. Farm incomes have increased moderately, but the overall costs exceed the benefits by far. Reasons for this are identified as poor targeting, diversion and leakage. The paper concludes with a review of policy recommendations, mainly focussed on improved targeting and diversification away from pure fertilizer subsidies.

Introduction

Although many countries in Sub-Saharan Africa (SSA) have gone through reform processes towards market liberalisation in their agricultural policies, fertilizer subsidy policies are again part of the policy agenda of countries like Malawi, Kenya, Mali and Zambia. While governments and donors in SSA regard input subsidies in the 1960s and 70s as a mean to boost agricultural production, inspired by the Green Revolution in Asia, a mind-shift took place in the 1980s as subsidies were found to be ineffective and causing financial and political problems (Crawford et al. 2003). Despite market liberalization efforts and withdrawal of governmental intervention, comprehensive entry of private input dealers did hardly take place (ibid.). Nevertheless, there are several reasons for the new popularity of fertilizer subsidies: the understanding that fertilizer use is crucial for national food security,

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the food price crisis in 2007/08, the public visibility of subsidy policies and the easier financing opportunities due to donor support (Kelly et al. 2011). In Zambia, fertilizer subsidies play a major role in input subsidy programmes, such as the Farmer Input Support Programme (FISP). Input subsidy programmes have grown significantly in physical and monetary volume over the last decade (see table 1), which leads to the question of its efficiency.

Prior to analyzing existing fertilizer subsidy programmes it is important to recognize their institutional character in Zambian society. Although marketing boards were abolished within the structural adjustment programmes in the early 1990s, Jayne (2008) argues that input subsidies are part of the social contract of Zambian society which makes their abolishment or replacement difficult. This contract includes low urban consumer prices for maize and sufficient producer prices for farmers. Subsidies are also an ambivalent political tool: on the one hand input subsidies are visible policies that promise constituency and, on the other hand, contain political risks for the ruling party if they are abolished (Jayne 2008). Efforts to seek different ways than the path of input subsidies in the first half of the 1990s have soon been replaced by the known support policies (for details see Minde et al. (2008)).

The purpose of this paper is to present important findings of the existing literature on fertilizer subsidies in Zambia and to discuss them critically while especially considering to which extent the current subsidy programmes have achieved their goals. Subsequently the FISP, the currently largest agricultural subsidy programme in Zambia, will be shortly described and its goals will be outlined. This is followed by a theoretical account of input subsidies and their effects on markets and efficiency. Finally, the major contributions of existing literature to this issue will be reported, eventually discussing adjustment possibilities for policy.

Farmer Input Support Programme (FISP)

FISP is the 2009/10 established successor of the Fertilizer Support Program (FSP) which has been in place since 2002/03 in Zambia (both will be referred to as FISP in the following, as differences are marginal). According to the Zambian Ministry of Agriculture and Conservation (MACO) goals of FSP as well as FISP have been and still are 1) the improvement of household and national food security, 2) the improvement of incomes for smallholders, 3) to grant them access to input and simultaneously 4) to regenerate their resource base and 5) to enable the private sector to supply farm inputs (MACO 2008). Mason et al. (2013) find that 6) poverty reduction is an implicit goal of the programme due to demanding about half the agricultural sector Poverty Reduction Programme's (PRP) means. Few companies were assigned by the government to import fertilizer.

Table 1: FISP expenditures, beneficiaries and fertilizer consumption

Year	FSP / FISP (billion ZMK)	FSPP as % of FISP	Number of beneficiaries	Actual beneficiaries as % of intended beneficiaries	Fertilizer delivered (MT)	FISP fertilizer as % of total fertilizer consumption
Column	1	2	3	4	5	6
2002	17.79	168.5	–	–	28,985	19.2
2003	50.00	8.0	102,113	85.1	48,000	29.0
2004	98.05	30.7	101,139	67.4	60,000	26.3
2005	139.99	14.9	64,854	56.4	46,000	32.5
2006	184.05	8.8	74,040	59.2	50,000	31.1
2007	204.54	5.2	164,229	78.2	84,000	41.9
2008	492.08	2.0	140,612	112.5	50,000	42.6
2009	565.12	1.8	192,860	96.4	80,000	39.8
2010	589.01	1.7	292,685	58.5	100,000	44.8
2011	895.39	1.7	430,141	48.3	178,000	47.6
2012	500.00	5.0	422,393	46.2	182,454	62.1
2013	499.97	–	–	–	183,634	51.1

Source: table adjusted according to Mason et al. (2013), column 6: author's calculations according to ibid. and FAOSTAT (n. d.).
Notes: ZMK (Zambian kwacha) nominal. 2012 and 2013 according to budgeting. FSP = Fertilizer Support Programme, FISP = Farmer Input Support Programme, FSPP = Food Security Package Programme. Columns 3 - 6 referring to agricultural year. 2009/10: fertilizer pack size halved.

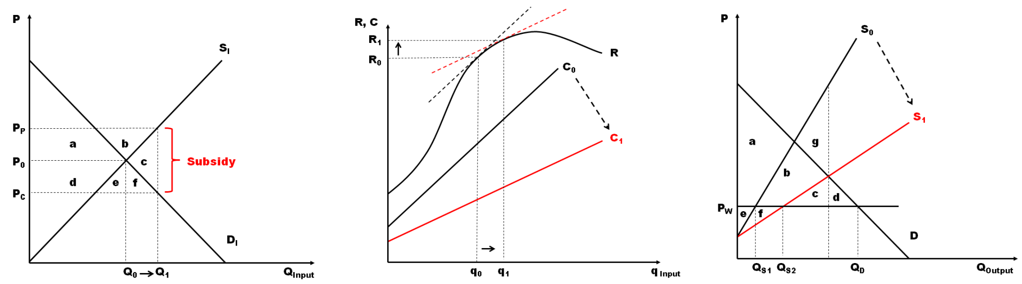
Mason et al. (2013) have lined out participation conditions for farmers. Anyone interested in participation has to be member of eligible cooperatives or farmer groups and can then be selected by cooperative boards, official extension officers and local leaders. Farmers need to have the capacities to grow between 0.5 and 5 hectares of maize, they need to be able to pay the respective farmer share of the input deliveries and may not participate in the Food Security Pack Programme (FSPP). The FSPP is a diverse subsidy programme designed to support very poor and socially disadvantaged smallholders, but it accounts for less than 5 % of the spendings compared to FISP (see table 1).

Input subsidies in theory

In theory, input subsidies affect equilibria on farms, input markets and output markets, assuming perfect competition. On input markets (figure 1a) a per unit consumer subsidy results in an increased input quantity demanded by farmers. Compared to the market equilibrium P_0/Q_0 a decrease in consumer prices to P_C (farmer purchasing price) and an increase in producer prices O_P (retailer price) occurs. The difference between P_C and P_P is the height of the subsidy. It is assumed that farmers purchase their fertilizer from local retailers and do not import directly. Thus, the input market can be interpreted as the market where domestic private dealers and farmers meet. Given this, due to the increased quantity demanded, an incentive to enter the input retailing market is provided by the subsidy.
The new price P_C at which inputs are purchased now results in lower marginal costs (MC). As shown in figure 1b the farm's cost curve for the respective input becomes flatter as inputs can be acquired more cheaply. In optimum, the farm employs an input quantity q where MC equals the marginal revenue (MR). The initial level of input is q_0 with revenue R_0. As the cost curve shifts from C_0 to C_1 the optimum quantity increases to q_1, while the new optimum revenue is R_1. Therefore, an input subsidy increases the optimum input quantity employed and the farm's outputs.
The decrease in MC also affects output markets, exemplary shown in figure 1c.

Figure 1: Farm and market reactions to input subsidies

(a) Input markets (b) Farm level (c) Output markets



Source: Author's illustrations
Notes: R = reveneue, C = costs for input, P_P = producer price, P_C = consumer price, P_W = world market price.

An input subsidy would cause the supply curve S_0 to rotate rightwards to S_1. Assuming an importing country with *negligible* market volume compared to the world market, the quantity imported would decrease as the domestic production quantity rises from Q_{S1} to Q_{S2}. As Q_D remains unchanged, the quantity imported

decreases.
The governmental intervention results in changes in overall welfare, as depicted in table 2. Welfare analysis indicates that governmental expenditures (GE) are larger

Table 2: Welfare effects of an input subsidy

Market	Δ GE	Δ PS	Δ CS	DWL
Input	-(a + b + c + d + e + f)	+ a + b	+ d + e + f	-c
Output	-(b + f + g)	+ f	0	- (b + g)

Source: Author's table
Notes: GE = Government Expenditures, PS = Producer Surplus, CS = Consumer Surplus, DWL = Dead-weight Loss. Input markets: PS refers to retailers, CS to farmers. Output markets: PS refers to farmers, CS to end-consumer.

than the gains for the respective producers and consumers on both markets, which results in a dead-weight loss (DWL). Note that the height of GE is necessarily the same on both markets. On input markets, changes in producer surplus (PS) and consumer surplus (CS) are both positive, making retailers and farmers both benefit from the subsidy. The market side with the more inelastic price elasticity is benefiting more from the subsidy programme. Farmers benefit from low costs and higher outputs while input retailers are likely to gain from increased demand. Therefore, arguments that input subsidies kick-start retailer markets may hold according to welfare analysis.
Similarly, changes in output markets due to governmental intervention also result in substantial welfare losses, as GE exceed the increases in PS (farmers), and CS (end-consumers) remains constant. Due to the assumption of a small importing country, CS is not changed, unless the subsidy does not allow for the country becoming an exporter.[1] This means an input subsidy does not have an effect on the well-being of food consumers, in theory. Hence, if food security for urban consumers shall be achieved, according to goal no. 1, low consumer prices cannot be expected to be an outcome. Nevertheless, the country is subsequently less dependent on imports which could be an implicit policy goal with respect to national food security. Producers profit from the subsidy, gaining welfare from an increased quantity produced.
These theoretical deliberations on direct effects of input subsidies predict an increase in input usage and farm output while imports decrease due to increased domestic supply. In line with goal no. 2, farm incomes could be incresed with possible subsequent effects on rural poverty (goals 2 and 6). Improvements for

[1]If a closed economy is assumed, CS is positive but PS depends on the price elasticity of demand, surplus or loss both being possible. This may hold in domestic remote areas isolated from the world market but having access to the subsidy.

input dealers are possible according to the above assumption, which includes the possibility of beneficial effects on the rural non-farm economy, referring to goal no. 5. Despite the positive effects increased use of inputs, especially fertilizers, may have on soil fertility, overuse can also cause environmental damage, not allowing for sound predictions concerning goal no. 4. The severeness of environmental externalities caused by input subsidies is increasing with the factor's elasticities of demand and supply (Gerson and Feng 2013). Finally, welfare analysis clearly indicates substantial dead-weight losses which brings up the question whether governmental expenditures could be better allocated to other investments than input subsidies.

Method and data

The method employed in this paper is a literature review with previous systematic keyword search. The majority of studies quoted here rely on various farm-level panel surveys between 1999 and 2008, which serve as basis for descriptive analysis and econometric modelling. Most important are the Crop Forecast Survey and the Post-Harvest Survey, as well as the three Supplemental Surveys, jointly conducted by the Zambian Ministry of Agriculture and Livestock (MAL) and the Central Statistical Office (CSO) (compare Xu et al. (2009), Mason et al. (2013), Minde et al. (2008)). These are complemented by the cross-sectional Rural Agricultural Livelihoods Surveys (compare Mason and Tembo 2015) and various other national data sources, such as MACO, MAL and CSO (compare Ricker-Gilbert et al. 2013).

Empirical evidence

Fertilizer use and markets

Table 1 shows that the amount of fertilizer distributed has multiplied from FISP's implementation in 2002/03 until 2013. Similarly, the number of beneficiaries has roughly quadrupled in the same period, although the halving of fertilizer pack size to 100 kg per beneficiary throughout 2009/10 is noteworthy. Column 6 depicts the importance of FISP, as its delivered fertilizer amount has at least accounted for nearly 30 % of total national fertilizer consumption since 2006. Mason and Jayne (2013) have estimated an increase in total fertilizer use of 0.54 kg per kg subsidized fertilizer, on average, accounting for crowding-out (i. e. the reduction of private fertilizer sales to farmers due to the subsidy) and diversion (i. e. the proportion of fertilizer which is is purchased by the government but is not distributed to the intentional governmental channels)[2]. The authors estimate, for instance, an incremental national fertilizer use of 45,360 MT for 2006/07 and 96,120 MT for 2010/11, respectively.

The incremental use of fertilizer per unit subsidized fertilizer is differing over across smallholders. Poorer smallholders apply an additional 0.66 tons fertilizer to their fields while richer households only apply 0.56 tons (Minde et al. 2008). This indicates a differing crowding out rate of private sector input dealers along the wealth distribution of smallholders. This is explained by estimated 80 % of poor smallholders do not have financial means to purchase from private dealers, leading to high application rates (ibid.).

Maize production and prices

Mason et al. (2013) have examined farmer's responses in production patterns to the subsidy. They find an *ceteris paribus* increase of output of 1.88 kg maize per kg subsidized fertilizer, which is in similar a similar range as compared to 1.65 kg maize in Malawi (Ricker-Gilbert and Jayne 2011) and considered as relatively small. The authors constitute this small effect with late delivery of fertilizers on the one hand (ibid.) and Zambia's wide-spread acid soils, which limit yield response rates to basal dressing fertilization (Burke et al. 2012b). Further evidence for the rather small positive effect of FISP on maize prodcution is that only 15 % of Zambia's 2011 record harvest could be accredited to increased fertilizer use, while 42 % must be attributed to favourable weather conditions (Mason et al. 2011).

The effects on maize prices are marginal. Ricker-Gilbert et al. (2013) found that doubling the amount of subsidized fertilizer distributed would decrease real maize prices between 1.8 % and 2.4 %. The analysis shows similar effects for Malawi, where a doubling results in a reduction of real maize prices between 1.2 % and 1.6 %.

Targeting

Scientists have examined access and allocation of subsidized fertilizer with respect to socio-economic HH characteristics, shortly referred to as targeting. As shown in table 1, although FISP has experienced an enormous rise in participation, it has often lagged behind its aspirations regarding the number of intended beneficiaries. For example, the programme had 422,393 members in 2012, four times the amount of 2003, but with 46.2 % it did not reach half of its intended benefit recipients.

[2]The authors call this phenomenon leakage in the original study. This paper follws Jayne et al. (2013), using the term *diversion* differently from *leakage* (resale of subsidized fertilizer or vouchers on village level)

Literature shows that the FISP participation condition of being able to cultivate more than 0.5 ha maize works effectively as entrance barrier for smallholders. Burke et al. (2012) estimate that this formal requirement has excluded roughly 15 % - 20 % of national farms in advance, Mason et al. (2013) calculate with 17 %. Weber (2008) (as cited in Minde et al. (2008)) assumed 40 % of national farms exluded from participation in FSP (threshold in FSP: 1 ha). Further entrance barriers are said to be large cash outlays necessary for becoming member of farmer cooperatives and the unability of smallholders to afford the farmer's share of purchasing the subsidized fertilizer packages (Burke et al. (2012), Mason et al. (2013)).

Examining the distribution of subsidized fertilizer under smallholder farmers (0 - 20 ha), Minde et al. (2008) find wealthier farmers in terms of landholdings and assets to receive more subsidized fertilizer (compare table 3). Mason et al. (2013) confirm this, arguing that smallholder farmers with more farm and non-farm assets are more likely to participate in FISP and, if doing so, they receive more fertilzer. Another important aspect of targeting is the spatial proximity of farms to main roads or towns: remote farms are less likely to benefit from FISP (Mason et al. 2013a).

These findings are in line with the Zambian government's targeting goals: *"The government's stated rationale for targeting the more capitalized farmers was that they would use fertilizer more efficiently than smaller farms and contribute more to national maize supplies."* (Minde et al. 2008, p. 12). As given in table 3 (col. 7 - 9), wealthier farms are more likely to sell maize *and* they sell more. Some studies therefore suppose that Zambia's government tries to reduce poverty by reducing maize prices through increasing supply by targeting wealthier farms, often referred to as *vulnerable but viable* (Mason et al. (2013), Ricker-Gilbert et al. (2013)). As shown above, it is questionable that this argument holds.

Col. 10 in table 3 shows the average products according to farm sizes, proving small farms with less than 1 ha being able to generate the highest maize output of 3.73 per kg fertilizer. This could be an incentive to redirect fertilizer to these farmers, resulting in a more efficient use of fertilizer and possible effects on poverty (Burke et al. 2012a). Currently, 15.5 % of FISP fertilizer is distributed to farms with less than 1 ha, accounting for 40.6 % of smallholder households (compare col. 1 and 6, table 3).

Poverty Reduction

To answer whether fertilizer subsidizing policies can reduce poverty efficiently although they are biased in their targeting, literature provides two different lines of reasoning. First, some authors argue that FSP/FISP contribution is negilible as poverty has not substantially decreased during the last decades, despite the enormuous expenditures for the programmes and its physical amplification, letting poverty rates only decline from 80 % to 78 % since 2004 (Jayne et al. (2011), Mason et al. (2013)).

Mason and Tembo (2015), on the other hand, argue that the causality aspect is not considered in the statement above and ask how poverty incidence and severity would change if the subsidy programmes had *not* been in place, referring to the Foster-Greer-Thorbecke method (see Foster et al. 1984). They estimate that an additional 200 kg FISP fertilizer (pack size) increases *ceteris paribus* the average total household income by 7.7 % by improving crop income (non-crop income sources are not affected), on average. Although the probability to fall below the US$ 2.00 poverty threshold or the US$ 1.25 extreme poverty threshold, respectively, is not influenced by the FISP fertilizer component according to the authors, an additional 200 kg FISP fertilizer pack slightly reduces poverty severity by 2.7 % or 3.6 % for extreme poverty, respectively. So, this study suggests that although household incomes improve moderately, the effect on poverty reduction is small, if existent at all. In comparison, the current FISP pack size of subsidized hybrid maize seed (10 kg) improves farm incomes by 1.1 % while reducing poverty severity by 0.7 % (Mason and Smale 2013).

Eventually, descriptive as well as econometric studies suggest that fertilizer subsidies contribute only little to poverty reduction. This hints at a disparicy between the large share of FISP on PRP and the comparably small effect on poverty.

Discussion: Have the goals been achieved?

The previous section has quoted the results of several studies with respect to fertilizer use, summarized as follows: FISP has increased maize production, although this effect is rather small. Crowding out and leakage have significantly reduced the efficiency of the subsidy, leading to an estimated third of FISP fertilizer was not allocated to intended beneficiaries. Subsidy efficiency is simultaneously dwarfed due to logistical problems in fertilizer distribution leading to delayed delivery and difficult agro-ecological conditions. Accordingly, decreases in retailer maize prices are marginal.

Assuming poor farm households being net food buyers (Ricker-Gilbert and Jayne 2011), the effect of the subsidy on rural and urban food security can be considered as not satisfying, with respect to goal no. 1. On the other hand, as productivity of smallholders raised slightly, local effects on food supply may be existent. Although the overall effects are small, especially compared to claims on the programme's outcomes, it is necessary to acknowledge that even small reductions in maize prices can improve the situation of the rural poor (Ricker-Gilbert et al. 2013).

Table 3: Farm size distribution, poverty rates, FISP fertilizer distribution, maize selling and average fertilizer product compared by total area cultivated

Area cultivated by farm in ha	% of smallholder HH	% of all smallholder HH below poverty line	Poverty rate in group	% of HH in group receiving FISP fertilizer	Mean kg FISP fertilizer received by beneficiary	% of total FISP fertilizer received	% of HH in group selling maize	Mean kg maize sold per selling HH	% of total sold maize	Average product of fertilizer (kg maize per kg fertilizer)
Column	1	2	3	4	5	6	7	8	9	10
0 - 0.49	17.0	17.7	78.4	7.2	161	2.5	12.1	440	0.9	3.73
0.5-0.99	23.6	26.0	83.2	22.5	190	13.0	29.8	763	5.2	
1 - 1.99	31.9	34.1	80.6	32.1	225	297	48.2	1,203	18.0	3.48
2 - 4.99	23.5	20.5	65.8	47.2	286	41.0	66.3	2,620	39.7	3.52
5 - 9.99	3.3	1.7	37.9	54.5	458	10.7	83.6	7,975	21,5	3.68
10 - 20	0.6	0.1	14.8	50.0	766	3.2	98.2	23,937	14.7	3.46
Total	100	100	75.5*	30.0*	259*	100	43.5*	2,368*	100	—

Source: table adjusted according to Mason et al. (2013) and Burke et al. (2012) as cited in Mason et al. (2013). (column 10)
Notes: *) weighted mean of column, rest column sum. 1,417,992 smallholder HHs in total. Data from 2010/11 agricultural year. Cultivated area excl. fallow. Column 2 and 3: poverty line according to US$ 1.25 poverty threshold. Column 10: referring to agricultural year 2006/07 incl. fallow.

Despite the subsidy's relative positive impact on smallholder incomes (+ 7.7 %) is larger than the relative effects on maize prices, the effects on poverty are comparedly small, as poverty severity is only reduced between 2.7 % and 3.6 % (Mason and Tembo 2015). This can partly explain why poverty rates did not decrease, although the amount of FISP fertilizer has increased substantially. Although farm income (goal 2) has raised moderately, effects on poverty (goal 6) are negligible as compared to FISP's budget share in PRP.

The reason for FISP's poor efficiency lies, among others, in its targeting. Many studies quoted here have shown that there are significant entrance barriers for poor farmers if they intend to participate in FISP. Roughly 70 % of smallholders cultivate less than 2 ha land, roughly 40 % being below the US$ 1.25 poverty line (compare table 3). Only 21 % of total FISP fertilizer is distributed to this group.

According to Mason et al. (2013), the rationale of Zambia's subsidy programmes FISP and FSPP has been the support of *vulnerable but viable* smallholder farmers. Although this phrase is not explicitly defined, it suggests that major support should be given to smallholders below the poverty line.

As shown above, the majority of FISP fertilizer is distributed to wealthier farmers. FSPP is targeted to the poorest, but it is poorly equipped with financial means compared to FISP or the number of potential beneficiaries. This may be a reason for low poverty impacts of FISP. In order to improve maize production efficiently, targeting should be revised according to the farm's productivity, what includes a redirection of means to the poorest smallholders. (Burke et al. 2012a). As FISP is poorly targeted, access to input is not granted for all farmers and goal no. 3 only partly achieved.

Targeting is also not satisfying due to diversion. In Zambia, 33 % of FISP fertilizer does not reach the intended farms, but is probably traded in commercial channels (Mason and Jayne 2013). Diversion is affecting crowding-out of private retailers: they cannot compete with salesmen who have acquired their goods from diverted fertilizer because it can be sold much cheaper on private markets (Jayne et al. 2013). This system is probably stable as long as the subsidy is in place. Due to this second marketing channel, the assumption of *one* fertilizer market made above does not hold. The incentive for private input dealers to enter the market is weakened. This tendency is enforced if only few private input dealers are involved in fertilizer distribution, compared to the total number of input dealers (Xu et al. 2009).

Similarly, leakage can be a targeting problem, although literature does not provide detailed insights to this topics. As fertilizer packs can be sold by recipients to non-beneficiaries at higher prices than the subsidized price, it could be interesting for farmers not to use fertilizer on their fields, especially when fertilizer is delivered late.

Evidence on whether FISP can help smallholders to sustain their resource base (goal no. 4) has not been considered so far. Considering Zambia's acidic soils, Burke et al. (2012) argue that fertilizer subsidies can indeed play a role in increasing soil fertility, if e. g. lime is applied. Nevertheless, lime is expensive compared to other fertilizers and needs to be applied in far greater amount than for instance nitrogen fertilizers. Therefore, the current subsidy programme has limited impact on soil fertility.

On the other hand, Levine and Mason (2014) found that fertilizer subsidies *crowd-in* soil fertility management measures, such as organic fertilizer application, crop rotation and anti-erosion measures. Only the use of fallow land for fertility regeneration is found to be declining, what conforms with Mason et al. (2013), substantiating increased maize production being rooted in the reduction of fallow. Ultimately, the discussed shortcomings of FISP result in benefit cost ratios (BCR) (calculated for 2006/07 and 2010/11) between 0.37 and 0.76 with mean 0.52 for Zambia, compared to similar mean BCRs of 0.52 for Kenya and 0.56 for Malawi (Jayne et al. 2013). This proves the cost for fertilizer subsidies weigh out their benefits by far, with similar results for other countries using fertilizer subsidy programmes.

Conclusion and Policy Recommendations

The present synthesis of literature on the results of Zambia's FISP fertilizer subsidies has summarized a variety of data. The depicted research provides insights on the subsidy's effects on fertilizer use, influence on maize production and retailer prices, agro-ecological aspects as well as targeting and distribution issues. The comparison with FISP's stated goals yielded a divided picture. For one thing, FISP has failed to achieve the goals for food security, access to input for smallholders, poverty reduction and private sector boost in fertilizer retailing, at least in parts. Otherwise, there have been improvements with respect to farm incomes and soil conservation.

Many of the cited authors here call for substantial policy changes regarding FISP. Burke et al. (2012) emphasize the importance of an increased yield response rate through diversifying beyond fertilizer subsidies and considering findings of Zambian agronomic research with respect to seed varieties coping with acidity, fertilizer application methods and fertilizer components. Mason and Jayne (2013) recommend improved targeting and the reduction of leakage by means of an electronic voucher system or the redirection of financial means to the FSPP programme. Mason et al. (2013) argue similarly, highlighting the positive effects on poverty reduction by improved targeting of smallholders with between 0.5 ha and 2 ha land. Postulations to, *inter alia*, empower farmers, design fertilizer import and distribution more polypolistic, to improve infrastructure and to revise target-

ing goals and processes are formulated by Minde et al. (2008). Jayne et al. (2013) insist on improved design and implementation, as well as fitting governance solutions.
Interestingly, a study on fertilizer subsidies and voting patterns by Mason et al. (2013) found biased distribution of subsidized fertilizer to the ruling party's constituency, but could not prove a correlation between election results and fertilizer subsidies.
So, although some see subsidies in Zambia as an institution, there might be realistic opportunities to change the current system and make real progress towards the programmes goals.

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