



Impact of subsidized fertilizer price increase on rural livelihood: A case study in southern Malawi

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Abstract

Malawi first implemented an agricultural input subsidy program in the late 1990s. The program targets small farmers and is aimed at easing access to agricultural inputs, such as fertilizers and modern varieties of maize seeds. However, the subsidy program placed a heavy burden on the national budget due to the increased number of beneficiary households and high prices of imported fertilizers. Under these circumstances, the Government of Malawi announced a decrease in the fertilizer subsidy rate during the 2015/2016 agricultural season. This study examined the impact of price increase of subsidized fertilizers on poor farmers in southern Malawi. We found that the price increase of subsidized fertilizers caused a reduction in the use of fertilizers in the case study village, which characterizes acute poverty. Reduced fertilizer use among poor farmers, resulting from the price increase under the reform of the current Farm Input Subsidy Programme, jeopardizes the positive effects of subsidy programs shown by previous studies. We call for careful consideration of the likely consequences of policy changes. In addition, we see a strong need for subsidy program exit strategies that enhance farmers' abilities to improve maize productivity, as farmers cannot rely on subsidized fertilizers forever.

Keywords: Input Subsidy; Policy Reform; Maize; Rural Livelihood; Malawi

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1. Introduction

Smallholder agricultural production in Malawi is characterized by a heavy dependence of low-income farmers on low input and rain-fed maize production in large numbers. Due to low productivity and unstable weather, the country has experienced acute food shortages occasionally. Considering this background, beginning in the late 1990s the Malawian government introduced various programs targeting small farmers and aiming to increase maize productivity by easing farmers' access to agricultural inputs, such as fertilizers and modern varieties of maize seed. Such programs included the free distribution of input packages (Starter Pack Programme – SPP) from 1998 to 2000 and the provision of heavily subsidized inputs (Targeted Inputs Programme – TIP, later renamed the Farm Input Subsidy Programme – FISP) from 2001 (Levy, 2005; Dorward and Chirwa, 2011; Ricker-Gilbert and Jayne, 2016). Under the recent FISP, the government identified beneficiary households and distributed coupons that allowed those households to purchase two bags of fertilizers and maize seed at heavily subsidized prices.

Due to the large number of beneficiaries (approximately 1.5 million), the subsidy program placed heavy burdens on the national budget (Dorward et al., 2013). The main cost components of the program are fertilizers, maize seed, and fuel for transport. Among those costs, fertilizers represent the largest cost, a cost that has increased over the years because of the rising international fertilizer price. As a result, during the 2008/2009 season, for example, the FISP budget accounted for approximately 74% of the agricultural budget and 16% of the total national budget (Dorward and Chirwa, 2011). This cost led the government to announce a program reform that included a decrease in the subsidy rate of fertilizers from 97% during the 2014/2015 season to 82% during the 2015/2016 season. The reform resulted in an increase in the farmer contribution from Malawian Kwacha (MK) 500 (US\$1.33) to MK 3,500 (US\$5.93) per 50 kg bag of fertilizer.

2. Objective

This study aims to examine the effects of the price increase of subsidized fertilizers on the livelihoods of farmers in rural southern Malawi. Based on data obtained from the same households in a case study village before and after the price increase of subsidized fertilizers, we found that the program reform resulted in a reduction of fertilizer use. This was due to farmers' widespread practice of purchasing subsidized fertilizers collectively after the price increase. The collective purchasing also resulted in an increased leakage of subsidy benefits from targeted beneficiaries to other villagers.

Previous studies on the effects of the agricultural input subsidy program in Malawi examined whether the program (1) increased maize production, (2) promoted household food security, and (3) enhanced rural income. Examples are Holden and Lunduka (2013) and Chibwana et al. (2014) studies, which showed that agricultural input subsidy enhanced the maize production of beneficiary households. Bezu et al. (2014) also found a positive correlation between the use of improved maize seed and household welfare. These analyses, however, were based on data from a national survey conducted before the program reform in 2015/2016.

Chirwa et al. (2016) evaluated the effects of the program reform in 2015/2016 and concluded that the price increase of subsidized fertilizers did not lead to a reduction in input. This is in direct contrast to our finding, and we attribute the contrast to the different data sources. Chirwa et al. (2016) work was based on survey data obtained from 14 districts all over Malawi, while our analysis is based on a case study of one village, characterizing acute poverty. The two studies are not contradictory but complementary, as Chirwa et al. (2016) illustrated the effects of the program reform on “average” farmers, while our study deals with its effects on poor farmers. Additionally, our in-depth case study provides a context-specific analysis of farmer strategies in response to the policy change, which may not be fully captured by a large-scale survey.

3. Methodology

Fieldwork for this study was conducted in the Southern Region of Malawi. The Southern Region was selected because of the higher rural poverty rate (63.3%) as compared to the national average (56.6%) (NSO, 2012). The case study village was selected to reflect the situation of acute poverty and disadvantaged circumstances, such as location, degree of population pressure on land, less variation in access to non-farm activities, and remoteness from the central district. The selection of study location was made after consultations with the District Agricultural Development Office and Extension Planning Area, and the Zomba District was ultimately chosen as the case study area. The Zomba District is the old capital city of Malawi, and the infrastructure there is relatively more developed than that of surrounding areas. However, the case study village (Epiphi) is located 39 km from the central district area, and there are no tarmac roads or regular transport services to the nearest market, which is 6 km from the village (Figure 1). Villagers use their own push bikes or walk to the market to buy food and other necessities. Their livelihood is dependent on maize-based agricultural production under a rain-fed production system.

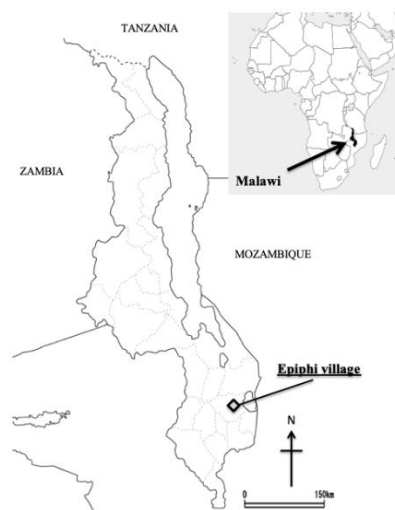


Figure 1. Map of study location

Data pertaining to the 2014/2015 season were collected in August 2016 and in August 2017 for the 2015/2016 season. Simple random sampling was used to select sample households in the village. We collected

panel data from 57 out of 85 total households in the study village. Among the 57 samples, 56 households purchased subsidized fertilizers in either the 2014/2015 or 2015/2016 season or in both seasons. The discussion that follows is based on the data from these 56 households. Each farm operated by the sample households was measured with GPS to obtain accurate farm size data in order to calculate the amount and the cost of fertilizer application per hectare (ha). Table 1 presents the socioeconomic characteristics of the case study village.

Table 1. Summary of sample households in the study village

Study year	2014/2015	2015/2016
Total number of sample households	56	
Average number of household members	5.1	5.1
Average of the total household income (MK)	75,743	88,866
Average farm size per household (ha)	0.5	0.7
Average farm size per capita (ha)	0.11	0.14
Percentage of households engaged in non-farm activity	21.4%	30.4%
Percentage of households engaged in casual wage labor (called <i>ganyu</i> in Malawi)	88%	93%
Average years of education of household head	4.4	

Source: Author's own survey.

Note: Income figures were deflated to 2014 prices using the rural consumer price index.

The exchange rate in 2014 was MK 375 per US dollar. (MK: Malawian Kwacha)

4. Results and discussion

4.1. Increased collective purchasing of fertilizers

The field survey revealed that there were two beneficiary categories of the subsidy program. One was the *targeted beneficiaries*, who were selected by the government as beneficiaries of FISP, received coupons, and used them to purchase subsidized fertilizers. Another was the *unintended beneficiaries*, who were not selected by the government but were able to purchase subsidized fertilizers through collective purchasing with targeted beneficiaries. Targeted beneficiaries who could not afford to purchase subsidized fertilizers by themselves often opted for collective purchasing with other villagers and shared the purchased fertilizer among them. In effect, the practice of collective purchasing leads to a leakage of program benefits from targeted farmers to other villagers or unintended beneficiaries.

The price increase of subsidized fertilizers in 2015/2016 resulted in increased collective purchasing, because more farmers became unable to purchase subsidized fertilizers by themselves. As a result, the number of unintended beneficiaries increased from 8 in 2014/2015 to 38 in 2015/2016, despite a decrease in the number of targeted beneficiaries from 29 to 14 during the same period (Table 2).

Table 2. Subsidized fertilizer use and cost of beneficiary household

Study year	2014/2015	2015/2016
Number of targeted beneficiaries of FISP	29	14
Number of unintended beneficiaries of FISP	8	38
Total number of FISP beneficiary households (targeted and unintended)	37	52
Average use of subsidized fertilizers per hectare (kg)	211**	111**
Average cost of subsidized fertilizers per hectare (MK)	2,086**	6,333**

Source: Author's own survey.

Note: Figures were deflated to 2014 prices using the rural consumer price index.

The exchange rate in 2014 was MK 375 per US dollar. (MK: Malawian Kwacha).

** indicates the difference between 2014/2015 and 2015/2016 data with significance at the 1% level with a t-test

4.2. Causes of collective purchasing

Based on the survey conducted in 14 districts in different parts of Malawi, Chirwa et al. (2016, p. 26) concluded that 89.9% of farmers were able to afford redemption of coupons after the 2015-2016 reform price increase from MK 1,000 (US\$2.66) to MK 7,000 (US\$11.86) for two bags of fertilizers. They also argued that a further increase up to MK 14,000 (US\$23.73, based on a 2015 exchange rate) would be affordable by 43% of farmers (p. 28). This outcome is unlikely in our study village, since farmers responded to the price increase by engaging in collective purchasing due to their inability to afford the higher cost.

The farmers' inability to afford the increased cost of subsidized fertilizers reflected the acute poverty situation and lack of farm and nonfarm income opportunities in the study village. The Government of Malawi indicated in 2011 that the average landholding size per household in Malawi was 1.2 ha, while that of the study village was 0.5 ha. The national average of per capita landholding was 0.33 ha (GoM, 2011), while in the study village it was only 0.11 ha. The average per capita landholding of the study village was even smaller than that of the national average of poor households (0.23 ha). The major cash crop in Malawi's smallholder sector is tobacco, but in the study village only one farmer was engaged in tobacco production. Engagement in nonfarm economic activities was not particularly low in the study village (21.4% in 2014/2015 and 30.4% in 2015/2016), compared to the national average of 26.9% (NSO, 2017). However, in the study village we found only two households engaged in salaried employment (primary school teacher and builder). Other nonfarm activities represented poorly remunerated self-employment, such as a tailor, barber, bicycle mechanic, or petit food trader. Low education levels in the study village also limited the opportunities to engage in highly remunerated economic activities. In Malawi, 68.4% of individuals engaged in salary, wage, commissions, or any payment activities possessed a tertiary education (NSO, 2017), while in the study village, household heads had an average of only 4.4 years of education.

Under the acute poverty and lack of income opportunities described above, many farmers in the study village were unable to afford the higher price of subsidized fertilizers during the program reform of 2015/2016.

The incremental cost of subsidized fertilizers after the price increase (MK 6,000 [US\$9.20] for two bags) was equivalent to 5% of the average household income in 2015/2016. This amount could purchase 46 kg of maize that could support the consumption of an average village household for 0.8 months. To earn the same amount, a villager had to work for 6.2 days in farmland preparation under a casual wage labor contract (called *ganyu* in Malawi). Increased cases of collective purchasing after the price increase of subsidized fertilizers reflected such situations and constituted the farmers' coping strategy.

4.3. Fertilizer use and maize production cost structure

Although the total number of subsidy beneficiaries (targeted and unintended) increased, the amount of fertilizer used per hectare decreased from 211 kg to 111 kg after the 2015/2016 program reform (Table 2). This decrease was due to the higher price of subsidized fertilizers leading to increased cases of collective purchasing, resulting in a smaller quantity of purchased subsidized fertilizer per farmer. Despite the reduced use of subsidized fertilizers, the cost of subsidized fertilizers per hectare increased from MK 2,086 (US\$5.56) to MK 6,333 (US\$16.88) due to the higher fertilizer price (Table 2). Therefore, the situation in the study village was characterized by reduced use but higher cost of fertilizer per hectare after the program reform.

Table 3. Total fertilizer use and cost by beneficiary status change

Beneficiary status change		Number of households	Average total amount of fertilizer use per hectare (kg)		Average total cost of fertilizers per hectare (MK)	
Study year			2014/2015	2015/2016	2014/2015	2015/2016
2014/2015	→ 2015/2016					
Targeted beneficiaries	→ Targeted beneficiaries	9	190**	118**	1,904**	8,821**
Targeted beneficiaries	→ Unintended beneficiaries	17	273**	121**	6,287*	10,861*
Unintended beneficiaries	→ Unintended beneficiaries	6	180	161	13,777	16,342
Unintended beneficiaries	→ Targeted beneficiaries	1	142	148	1,420	8,371
Total		33	230**	128**	6,306	11,226

Source: Author's own survey.

Note: Figures were deflated to 2014 prices using the rural consumer price index.

The exchange rate in 2014 was MK 375 per US dollar. (MK: Malawian Kwacha)

* indicates the difference between 2014/2015 and 2015/2016 data with significance at the 5% level

** indicates the difference between 2014/2015 and 2015/2016 data with significance at the 1% level with a t-test

The table only includes households that purchased subsidized fertilizers in both years.

The reduction in fertilizer use after the price increase of subsidized fertilizers differed according to beneficiary status each year (Table 3). The largest reduction was observed among those who were targeted beneficiaries in 2014/2015 but who were unintended beneficiaries in 2015/2016. Not selected as targeted beneficiaries in 2015/2016, they had no choice but to rely on collective purchasing to obtain subsidized (but more expensive than the previous year) fertilizers. These farmers were only able to purchase smaller quantities than the previous year, because they had to rely on targeted beneficiaries for access to subsidized fertilizers. The second largest reduction in fertilizer use was observed among the targeted beneficiaries in both years.

Many targeted beneficiaries became unable to afford subsidized fertilizers after the price increase in 2015/2016, and therefore opted for collective purchasing, which resulted in reduced fertilizer use. Those least affected by the program reform were the unintended beneficiaries during both years. As farmers in this category purchased a relatively small amount of subsidized fertilizer through collective purchasing and supplemented it with commercial fertilizer during both years, the extent of the negative effects caused by the price increase was smaller than that of other categories. The total cost of fertilizer increased among all categories, but again to a lesser extent among the unintended beneficiaries during both years. Therefore, the 2015/2016 program reform brought about different effects of fertilizer use on farmers with differing beneficiary status.

4.4. Change in the distribution of subsidy benefits

Increased cases of collective purchasing and reduced fertilizer use among targeted beneficiaries resulted in benefits of the subsidy program being more widely and thinly distributed following the 2015/2016 reform. Before the price increase of subsidized fertilizers, the amount of subsidized fertilizers used for maize production among targeted beneficiaries was significantly higher than that of unintended beneficiaries (Table 4). At that point, the cost of subsidized fertilizers was also higher among the targeted beneficiaries, but farmers were able to cover the costs by themselves. However, after the price increase, many targeted beneficiaries became unable to afford subsidized fertilizers and opted for collective purchasing, leading to a substantial leakage of subsidy program benefits from targeted beneficiaries to other farmers. As a result, after the 2015/2016 reform, no significant difference was observed in the use and cost of subsidized fertilizers between targeted beneficiaries and unintended beneficiaries (Table 4). In effect, the distinction between targeted and non-targeted farmers under the fertilizer subsidy program became blurred after the 2015/2016 reform. This result fails to meet the program's objective of easing the access to fertilizers for resource-poor farmers and other aids, as poor farmers became unable to purchase enough fertilizer after the 2015/2016 reform.

Table 4. Subsidized fertilizer use and cost by beneficiary status

Study year	2014/2015		2015/2016	
Beneficiary status	Targeted beneficiary	Unintended beneficiary	Targeted beneficiary	Unintended beneficiary
Number of households	29	8	14	38
Average use of subsidized fertilizer per hectare (kg)	230**	144**	110	111
Average cost of subsidized fertilizers per hectare (MK)	2,300*	1,312*	6,274	6,354

Source: Author's own survey.

Note: Figures were deflated to 2014 prices using the rural consumer price index.

The exchange rate in 2014 was MK 375 per US Dollar. (MK: Malawian Kwacha)

* indicates the difference between targeted beneficiary and unintended beneficiary data with significance at the 5% level

** indicates the difference between targeted beneficiary and unintended beneficiary data with significance at the 1% level with a t-test

5. Conclusion

This study examined the impact of the price increase of subsidized fertilizers on poor farmers in southern Malawi. Based on the results, we advise careful consideration of the likely consequences of policy changes. In the case study village, selected for its acute poverty, the FISP decision to reduce subsidies, resulting in an increased cost of subsidized fertilizers, in turn resulted in a drop in the use of fertilizers. This drop in the use of fertilizers jeopardizes the intended positive impact of subsidy programs, positive effects shown by previous studies. A further deduction in the subsidy rate to ease the budgetary burden in future would encourage even more farmers to engage in collective purchasing, resulting in less fertilizer use per hectare and per farmer. This outcome would threaten the original objective of FISP, which was to increase maize productivity among poor small farmers.

To phase out farmers' unsustainable reliance on subsidies and enhance their ability to improve agricultural productivity in general, strategies for exiting the subsidy program are necessary and vital. A first step toward such a strategy may be a reduced number of FISP beneficiaries with a more focused target population of poor small farmers, combined with a wider support structure aimed at enhancing the agricultural productivity of the same target group. Given the heavy burden on the government budget, continuous provision of heavily subsidized fertilizers cannot be maintained. On the other hand, an increased price of subsidized fertilizers to ease the budgetary burden results in the reduced use of fertilizers among poor farmers. A possible solution to this budget dilemma would be to pivot from the government's near-universal fertilizer subsidy in the current form to a subsidy version with more narrowly targeted population groups of poor farmers. This shift within the targeted population would enable the government to reduce the budgetary burden and avoid widespread leakage of subsidy benefits. Lastly, the government budget also needs to be directed more widely toward programs that enhance agricultural production in general, not just toward programs that enhance maize production by applying more fertilizers.

An apparent limitation of this study is that the analysis was based on data obtained from only one case study village. Given the widespread poverty in Malawi—especially in the Southern Region—similar situations are likely to be found in other parts of the country. Nevertheless, further studies are needed in other locations with different socioeconomic contexts. The accumulation of detailed and context-specific case studies on farmer response to policy changes, combined with analysis based on a large-scale survey, will contribute to a more multi-faceted understanding of the effects of subsidy programs on poor farmers.

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