The Agricultural Input Subsidy Programme 2005 to 2008: Achievements and Challenges

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1 Introduction

The 2008/9 agricultural season is the fourth year in which the Malawi Government has implemented its national agricultural input subsidy programme. The programme has attracted widespread international interest, within Africa and beyond, and is widely seen as a pioneer of a new generation of large scale 'smart subsidies' to get agriculture moving after years of stagnation. As the programme enters its fourth year, a substantial amount of formal and informal experience has been accumulated regarding the achievements of the programme and the challenges it faces in a changing international economic environment.

This paper draws on experience and reviews of the 2005/6, 2006/7 and 2007/8 programmes, and on emerging experience with the 2008/9 programme. It describes the main elements of the programme, the way that different aspects of these have changed as lessons have been learnt and new challenges faced, the achievements of the programme, and the challenges and opportunities there are in seeking to improve its effectiveness, efficiency and sustainability. It was originally prepared in December 2008. This June 2009 revision updates information for the 2008/9 programme where it is available. 2008/9 programme benefit:cost estimates have been removed and have not been updated as there are some uncertainties regarding programme costs, and to present estimates at this time without first resolving these uncertainties will add little to the earlier analysis and is likely to be misleading.

2 Background

Malawi has implemented different kinds of agricultural input subsidy over many years. Following severe food security difficulties in the early part of this century, however, the government decided to implement in 2005/6 a very large scale subsidy using vouchers, and targeting roughly 50% of farmers across the country. The programme has been repeated in subsequent seasons, building on core experience but expanding the programme and modifying implementation systems from year to year. The objective of the programme (which has been refined over time) has been to increase resource poor smallholder famers' access to improved agricultural inputs in order to achieve food self sufficiency and increased income of resource poor famers' through increased food and cash crop production.

3 Main elements of the programme

The core of the AISP is the transfer to selected rural households of a voucher which will benefit them either by enabling them to increase their use of fertiliser, seed or pesticides or by effectively giving them a cash transfer as they either sell the voucher or they use it to finance the purchase of inputs that they would have purchased anyway. If the voucher leads to increased (incremental) input use it should lead to an increase in agricultural land and labour productivity and to extra production of the crop to which it is applied. There are then subsequent effects of this in terms of increased household income, changes in market demand and/or supply (and prices), changes in labour demand and supply and wages (due to the large scale of the programme), soil fertility, and people's knowledge of and attitudes to input use. Other major impacts of the AISP are that it is a major intervention in input markets – affecting fertiliser and seed importers, seed producers, and input wholesalers, retailers, and agrodealers. It is also a major logistical activity involving very significant resources in the purchasing and transport of inputs and in the distribution and redemption of vouchers, with potential to crowd out other agricultural services.

Table 1 Summary of 2005/6 to 2008/9 programmes

	2005/6		2006/7		2007/8		2008/9*	
	planned	actual	planned	actual	planned	actual	planned	actual
Fertiliser voucher distribution (mt equivalent)	137,006	166,156	150,000	200,128	170,000	216,000	170,000	195, 369
Households receiving one or more fertiliser coupons	1,370,060	n/a	1,500,000	1,772,280	1,700,000	n/a	1,700,000	2,448,000
Subsidised 'maize' fertiliser sales (mt)	100,006	108,986	130,000	152,989	150,000	192,976	150,000	178.4**
Subsidised 'tobacco' fertiliser sales (mt)	37,000	22,402	20,000	21,699	20,000	23,578	20,000	19.6**
Total Subsidised fertiliser sales (mt)	137,006	131,388	150,000	174,688	170,000	216,553	170,000	202,278
Redemption price (MK/50 kg)	950 for maize fertilisers, 1450 for tobacco fertilisers			950		900		800
Voucher value (MK/bag, approx))		1,750		2,480		3,299		9,000
Subsidy as % of unsubsidised price (approx)		64%		72%		79%		92%
Subsidised maize seed sales (MT)	6000	??	n/a	4,524	n/a	5,541	4,750 **	5,365
% Hybrid seed	0	0	n/a	61%	n/a	53%	n/a	84%
Cotton seed (mt)	0	0	0	0	n/a	390	n/a	435
Legume seed (mt)	0	0	0	0	n/a	24	n/a	tbc
Cotton chemicals vouchers	0	0	0	0	200,000	131,848	200,000	tbc
Grain storage pesticide vouchers							2,000,000	tbc
Total programme cost (MK million)	5,100	7,200	7,500	12,743	11,500	16,346	19,480	tbc.

* 2008/9: figures available 16th June, household figures based on MoASF far families. ** provisional figures from sales monitoring

Sources: Logistics Units reports; 2005/6 (CISANet), 2006/7 (SOAS et al) and 2007/8 (MoAFS) evaluation reports; key informants; MoAFS Implementation guidelines; GoM budget statistics; 2008/9 preliminary survey results.

Table 1 shows the main features of the completed 2005/6, 2006/7 and 2007/8 programmes. Information on the 2008/9 programme is also provided, as available on 16th June. More detailed information about these variables and about changes in programme implementation and impact is provided and discussed in the following sections.

4 Programme design and implementation

The 2005/6 programme provided the base or foundation on which subsequent programmes have built. We therefore describe this in more detail before considering changes made in subsequent programmes.

The objectives of the programme were to promote access to and use of fertilizers in both maize and tobacco production in order to increase agricultural productivity and food security. Fertiliser coupons were distributed to districts and EPAs in two rounds. In the first round allocation was broadly in proportion to cropped maize and tobacco areas. Coupons were distributed to districts and Traditional Authorities (TAs) by the Ministry of Agriculture. TAs were supposed to allocate coupons between villages, to Village Development Committees, who were then supposed to identify recipients to receive coupons which they could then redeem, at a reduced cash price, for any of the four fertilizer types. There was considerable variation between areas in the criteria determining prioritization and selection of beneficiaries, numbers of people receiving coupons, and numbers of coupons received per recipient household. A second, supplementary round of coupon allocation and distribution was made later in the season. 6,000MT OPV maize seed were also offered for sale without coupons at a price of MK150/3kg as compared with a market price of MK500/3kg. 48% of fertiliser purchases were supplied by private sector importers, but all distribution of subsidised inputs was by ADMARC and SFFRFM.

Holders of coupons were entitled to redeem coupons for fertilizer at the rate of 1 coupon and MK950 for one 50kg bag of 23:20 or urea ('maize fertilisers'), and at 1 coupon plus MK1,450 per bag of Compound D or CAN ('tobacco fertilisers'). These on average offered a two-thirds subsidy to farmers on the market cost of inputs. Coupons intended for different types of fertiliser were not marked as such and many coupons allocated for 'tobacco fertilisers' may have been used to buy 'maize fertiliser'. Sales continued into January, and in different areas were limited either by a lack of fertilizer stock or by a lack of coupons. In the latter case supplementary coupons were used in some areas, but shortages of fertilizer in time for it to be useful meant that significant numbers of coupons were not used. ADMARC/SFFRFM report total subsidy sales of 131,803 tonnes (representing 2.62 million coupons). No information is available on seed sales.

The programme is reported to have cost MK7.2 billion against a budget of MK5.1 billion. The reported programme cost excludes overhead costs but it is likely that it allows for only partial deduction of farmer payments to ADMARC and SFFRFM for coupon redemption: these amounted to a total of MK2.7 billion.

Following the popularity of the 2005/6 programme in Malawi and perception of its success, the government decided to implement the programme in 2006/7 with a number of modifications (see table 2). These involved an increase in the overall amount of maize fertilisers to be subsidised, a standard redemption price of MK950 per bag for all fertiliser types, improved coupon security (with differentiation by fertiliser type), involvement of the logistics unit, involvement of some large input supply companies in retail sales of subsidised fertiliser, and maize seed vouchers which could be exchanged at a wider range of outlets (including agro-dealers) for different quantities of OPV or hybrid. The seed component, some

logistic unit costs and an independent programme evaluation were funded by donors, who had not directly financed any part of the 2005/6 programme (other than through budget support). Donors also funded a buy-back scheme, which reduced the risks to government of carrying stocks over at the end of the year if private sales led to lower than expected sales by ADMARC and SFFRFM.

Planned and achieved subsidy sales and costs in 2006/7 (and other years) were shown in table 1, and further information on regional allocations is shown in table 3. The issue of supplementary fertiliser vouchers together with availability of fertiliser for sales by private companies (who sold just under 30% of subsidised sales, see table 6) led to higher sales volumes than budgeted and these, together with higher prices than budgeted, led to significant budget overruns. These problems were not faced with seed sales where no extra coupons were issued.

Growing experience with the programme led to consolidation in 2007/8 of many of the changes made in 2006/7, together with further changes to extend the scope of the programme. Programme objectives and beneficiary targeting criteria were amended to give greater emphasis to concerns for vulnerable households. Targeted quantities of subsidised maize fertiliser and seed were again increased, to roughly equal disbursements the previous year. Changes were made to coupon allocation systems between districts to provide greater weight to the number of farming households (and less weight to crop areas) and (following problems in some areas in 2006/7) systems for allocation and distribution of coupons within districts modified to give less power to TAs and more responsibility to MoAFS staff. The shift in the responsibility is a reflection of greater support from communities to disburse vouchers through MoAFS staff following the experimentation in the 2006/07 programme. Registration of all farm households was completed but not in time to allow use of the register in coupon allocation to individual households. In addition to maize seed vouchers provided with maize fertiliser coupons, extra 'flexible vouchers' for maize or legume seed were issued (allowing farmers to choose what seed they wanted, though in fact legume seed supplies were very limited), and coupons were also distributed through ADDs for cotton seed and chemicals. A 'remote EPA premium' was introduced to provide incentives to private retailers to extend their networks into areas with low coverage by private retailers.

Subsidised fertiliser volumes were again significantly over budget, with associated cost overruns, so that with higher than budgeted input prices programme costs were 29% above the budget in 2007/08 (compared to 18% in 2006/07). However, private sector subsidy sales were roughly the same as the previous year (increasing by only 6% from 49,000 mt to 52,000mt) whereas parastatal sales increased by approximately 30% from 125,000mt to 165,000mt).

A number of further changes have been made to the programme for 2008/9. The completed farm household register has been used to list coupon allocations to individual beneficiaries in open village meetings led by teams involving MoFS and local government staff. An attempt to print coupons in the government printer was followed by a significant security breach and central and northern region vouchers were then printed outside the country with extra security features (a watermark and fibres only visible with UV light, and a set of very small identification letters, not readable by the naked eye). The flexible maize and legume seed voucher and cotton input systems have been continued, and grain pesticides are also being subsidised. Private retailer involvement in the sale of subsidised fertilisers has, however, been discontinued. This has been associated with more stringent monitoring of ADMARC markets with prompt police action where market staff have accepted counterfeit coupons. Contracts for extra fertiliser purchases beyond that originally budgeted were awarded during the season.

Table 2: Principal changes in programme design and implementation, 2005/6 to 2008/9

	2005/6	2006/7	2007/8	2008/9
Subsidised inputs	Maize & tobacco fertilisers, Maize seed (OPV)	Maize & tobacco fertilisers, Maize seed (hybrid & OPV)	Maize & tobacco fertilisers, Maize seed (hybrid & OPV); legume seed (limited); cotton seed & chemicals	Maize & tobacco fertilisers, Maize seed (hybrid & OPV); legume seed, cotton seed & chemicals, maize storage chemicals
Voucher distribution system	District allocation by maize areas, distribution through TAs	District allocation by maize areas, distribution varied, through local government, TAs, VDCs, MoAFS	District allocation by farm hh & areas, distribution through MoAFS and VDCs	District allocation by farm hh & areas; use of farm household register, open meetings for allocation & disbursement led by MoAFS
Voucher redemption systems	Only through SFFRFM & ADMARC	Fertilisers also through major retailers; flexible maize seed vouchers through wide range of seed retailers	Fertilisers also through major retailers; flexible maize & legume seed vouchers through wide range of seed retailers; cotton inputs through ADDs	Fertilisers only through ADMARC & SFFRFM; flexible maize & seed vouchers through wide range of seed retailers; cotton inputs through ADDs
Other system innovations		Coupons specific to fertiliser type. Fertiliser buy back system. Involvement of logistics unit	Reduced copies of coupons. Remote EPA premium. Fertiliser buy back system	Extra coupon security features & market monitoring. No remote EPA premium. ADMARC computers for voucher processing

Sources: Logistics Units reports; 2005/6 (CISANet), 2006/7 (SOAS et al) and 2007/8 (MoAFS) evaluation reports; key informants; MoAFS Implementation guidelines.

Table 3 Planned & achieved subsidy allocations

	2005/6		2006/7		2007/8		2008/9*	
	planned	actual	planned	actual	planned	actual	planned	actual
North % fertiliser sales	22%	19%	14%	18%	17%	17%	14%	19%
Centre % fertiliser sales	47%	50%	47%	48%	44%	48%	41%	39%
South % fertiliser sales	31%	31%	38%	34%	39%	35%	44%	42%
Vouchers / farm family: North	1.52	1.30	1.03	1.51	1.22	1.78	0.97	1.54
Vouchers / farm family: Centre	1.03	1.05	1.08	1.28	1.05	1.57	0.92	0.98
Vouchers / farm family: South	0.52	0.49	0.70	0.73	0.79	0.94	0.89	1.09
Vouchers / farm family: All	0.83	0.80	0.89	1.04	0.99	1.29	0.96	1.10

Notes:
* 2008/9: Planned allocations exclude extra contracts awarded in December 2008
Vouchers / farm family: Farm families from 2005/6 and 2008/9 beneficiary matrices, interpolated for 2006/7 and 2007/9. Planned regional allocations for 2007/8 and 2008/9 exclude unallocated vouchers
Sources: Logistics Units reports; 2005/6 (CISANet) and 2006/7 (SOAS et al) evaluations; MoAFS beneficiary matrices .

5 Achievements

Evaluation of programme achievements involves consideration of the effectiveness and efficiency of the programme in achieving its objectives (in terms of outputs, outcomes and impacts), allowing for other programme impacts (positive and negative) beyond those explicitly recognised in programme planning and budgeting. No formal performance targets have been established for the programme. Figure 1 below provides a framework for considering the variables and issues that should or could be included in a full performance evaluation. We consider in this section the scale of implementation tasks; innovation and adaptation in implementation; implementation performance; and outputs and impacts.

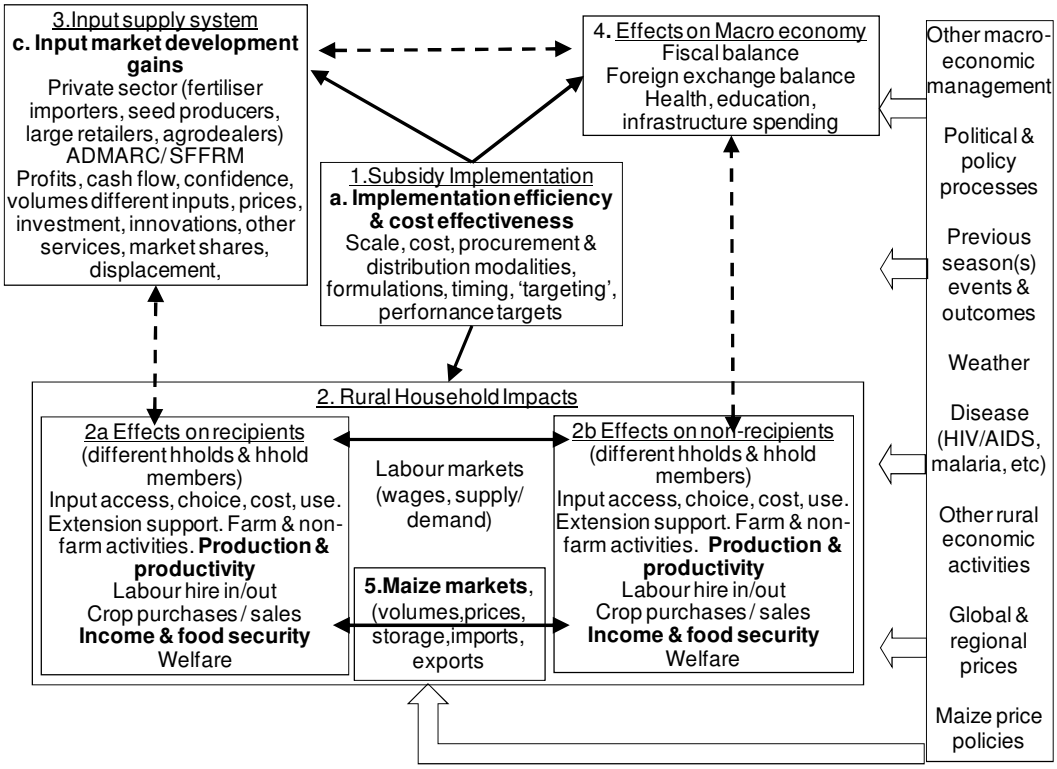

Figure 1. Framework for performance evaluation

5.1 Scale of implementation

The scale of the programme each year has been growing, and involves complex and very significant logistical and organisational challenges to tight deadlines. Major tasks are shown in figure 2. This is a highly simplified summary, with a complex set of activities needed for the completion of each task. It also does not show the scale of these tasks and of the interactions between various stakeholders: in 2008/9 this involves selection of over 2.5 million beneficiaries from around 3.5 million registered farm households, printing and distribution of 5.9 million coupons, and purchase and distribution of over 3.4 million bags of fertiliser – all to tight deadlines, to farmers (a significant number of whom are illiterate or semi-literate) widely dispersed across the whole country, some in remote and poorly accessible areas, with the constant temptation and threat of fraud or theft of highly valuable

commodities worth approximately MK16 billion (or US$220 million) in total, with each fertiliser coupon worth more than 10% of annual household income for the more than 40% of the population below the poverty line.

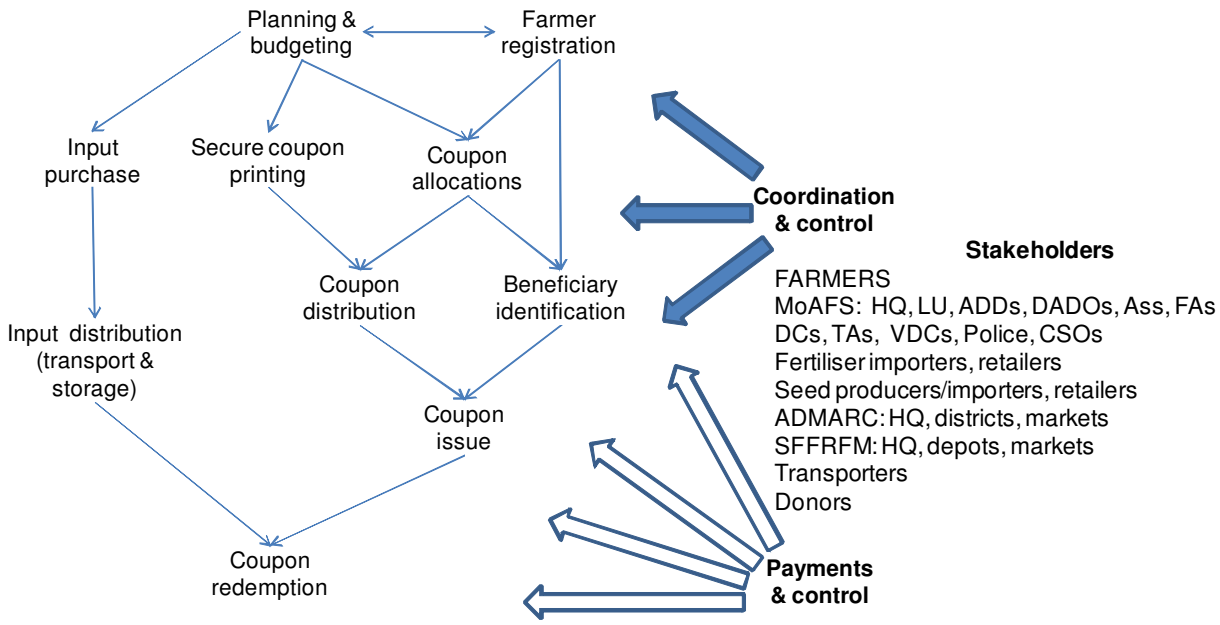

Figure 2. Major tasks in programme implementation

Evaluation of programme achievements needs to take account of the scale and complexity of implementation challenges, and of the ways that the programme seeks to address inevitable difficulties and to progressively improve performance.

5.2 Innovation and adaptation

The 2005/6 subsidy programme built on Malawi's innovative experience in implementing the starter pack (SP) and targeted input programme (TIP). These involved large scale registration and targeting across the country; development of systems using vouchers; coordination across different government, parastatal, private sector, donor and community stakeholders; and substantial logistical challenges. The 2005/6 programme involved a change in objectives (from an emphasis on social protection and food security for vulnerable households in the TIP to national food production and self sufficiency), an increase in scale of subsidised inputs (from around 50,000 mt of fertiliser in 2004/5 to 130,000mt in 2005/6), the addition of tobacco inputs, and cash redemption of vouchers.

Following the experience of 2005/6, the government has, with other stakeholders, implemented further innovations in attempts to address implementation difficulties, to improve performance of the programme (discussed below), and to broaden programme impact. These changes emerged from formal and informal management and evaluation reviews and lesson learning within the government (formal internal evaluations were conducted in 2006/7 and 2007/8); concerns of and discussions with other stakeholders (donors, private sector fertiliser importers and seed and fertiliser suppliers, parliamentary committee on agriculture, civil society; external evaluations (commissioned by CISANet for

2005/6 and by the Governments, DFID and USAID for 2006/7); and changing policy concerns in a changing economic and political environment.

The major modifications in 2006/7, 2007/8 and 2008/9 were discussed briefly above in section 4 and summarised in table 2. They concerned

- the extent and modalities of private sector involvement in fertiliser imports, fertiliser sales and seed sales, with a buy-back scheme to reduce government stock holding risks and, in 2007/8, a premium to stimulate private retail network development in more remote areas;
- recognition of the importance of including vulnerable households in targeted beneficiaries, with increasing volumes of inputs for maize production and modified district / EPA allocation systems;
- trialling of flexible vouchers for seed inputs and addition of cotton inputs and grain storage pesticides
- the introduction of beneficiary registration and more open and more tightly managed beneficiary selection, voucher distribution and market monitoring systems;
- coupon design, printing, security and farmer redemption prices; and
- shared funding with donors of some programme components.

5.3 Implementation Performance

Effectiveness and efficiency of implementation can be considered in terms of (a) volumes of subsidised inputs disbursed, (b) the timing of subsidy sales and supplier payments, (c) targeted beneficiary access to inputs, and (d) cost. We consider these in turn.

As shown earlier in table 1, both planned and disbursed ***volumes*** of subsidised inputs have increased steadily from 2005/6. Disbursement targets were not met in 2005/6, but have been exceeded in 2006/7 and 2007/8, by 16% and 27% respectively. Exceeding disbursement targets demonstrates considerable success in meeting demand, but also suggests difficulties in controlling disbursement and it contributes to cost overruns.

Timing of subsidy sales is determined by the timing of availability of inputs in markets and by timing of issue of vouchers to beneficiaries. For fertilisers the timing of input availability depends upon timing of tendering of input purchases and supplier deliveries to depots, and on staffing and stocking of input markets (for parastatal sales) and upon subsidy redemption contracts with retailers and their stocking and staffing of input sales points for private sector sales. Coupon issue depends upon timing of beneficiary registration, voucher allocations, voucher printing, voucher distribution to districts, and district distribution payments. Information on some of these variables is given in table 4. This shows general improvements in performance over time as regards earlier award of seed and fertiliser contracts and earlier fertiliser deliveries to depots and uplifts. Information on the timing of fertiliser sales is incomplete but current information suggests that this is also improving. Receipt of seed vouchers by the logistics unit is determined by the timing of sales and the speed of voucher processing by seed suppliers – it seems that there were problems with both in 2007/8.

Table 4: Implementation performance indicators.

	2005/6	2006/7		2007/8		2008/9	
	actual	planned	actual	planned	actual	planned	actual
Fertilisers							
Tender awards for parastatal supplies			late August		mid August		end July
Depot receipts end Oct as % parastatal total sales	n/a		32%		58%		53%
Depot receipts end Nov as % parastatal total sales	n/a		77%		76%		71%
Depot receipts end Dec as % parastatal total sales	n/a		95%		90%		93%
Outstanding payments end Nov (% & MKmillion)	n/a	28%	1,216	22%	1,595	16%	3,500
Outstanding payments end Dec (% & MKmillion)	n/a	46%	4,303	13%	1,192	13%	3,690
Outstanding payments end Jan (% & MKmillion)	n/a	14%	1,406	21%	2,620	n/a	7,707
Uplifts despatched by end Nov as % parastatal total sales	n/a		64%		70%		75%
Uplifts despatched by end Dec as % parastatal total sales	68%		96%		85%		90%
Relocation transport by end Dec (MK million)	n/a		n/a		2.7		18.7
Total relocation transport (MK million)	n/a		n/a		68.4		42.0
Finalisation of retail fertiliser contracts	n/a		early Nov		mid/late Nov		n/a
District voucher allocations	n/a		early Sept		9th Oct		12th Sept
Voucher printing	n/a		end Sept		end Oct	SR early Oct	CR/NR early Nov
Voucher & lists distribution to districts	n/a	virtually completed 7th November		virtually completed 3rd November		virtually completed 18th November	
Sales by end Nov as % total season sales	n/a		8%		n/a		30%
Sales by end Dec as % total season sales	47%		74%		n/a		68%
Sales by end Jan as % total season sales	n/a		96%		88%		94%
SFFRFM/ADMARC voucher returns end Nov ('000)	n/a		0		0		17
SFFRFM/ADMARC voucher returns end Dec ('000)	n/a		0		101		175
SFFRFM/ADMARC voucher returns end Jan ('000)	n/a		111		720		1057
Finalisation of seed supply contracts	n/a		mid/late Nov		mid/late Nov		early Nov
Seed coupons in LU by end Nov % season sales	n/a		3%		1%		1%
Seed coupons in LU by end Dec % season sales	n/a		27%		4%		6%
Seed coupons in LU by end Jan % season sales	n/a		74%		18%		22%

Sources: Logistics Units reports; 2005/6 (CISANet), 2006/7 (SOAS et al) and 2007/8 (MoAFS) evaluation reports; key informants

Targeted beneficiary access to inputs is determined by coupon allocation and issues and by their use of coupons, which may be affected by availability of subsidy inputs in accessible markets and by any 'tips' needed to redeem coupons. Comprehensive management information is not available on these topics, and household surveys provide the only systematic information available. Results from the household survey examining the 2006/7 programme suggest that

- targeting criteria were highly variable across different areas[1]
- overall targeting recommendations were followed to some extent in that there was a tendency for targeting to reach households which are productive full time farmers,
- in some areas, particularly the south and centre, coupon allocations were modified so that more households received one fertiliser coupon (rather than fewer receiving two)
- key informants tended to under-estimate the proportion of households receiving subsidised inputs as compared with information from household interviews which revealed that a larger proportion received subsidised inputs
- female headed and poorer households were less likely to receive coupons.
- 75% of ADMARC and private suppliers and 100% of SFFRFM outlets suffered from frequent major queues
- overall 5% of coupons were accessed with some payments with a median price of MK1000
- a tip was paid for redemption of about 20% of fertiliser coupons with a mean price per bag of just over MK1000 (compared with the official price of MK950) and with no significant overall differences between parastatal and private sector suppliers

No equivalent information is available for other seasons.

As regards the extent to which counterfeit or non standard vouchers (those with serial numbers outside the ranges recorded by the Logistics Unit) have been accepted by different outlets, records for 2007/8 show that these (and sales without vouchers) accounted for 27% of ADMARC/ SFFRFM sales and 3% of private retailer sales. Rapid return of vouchers to the Logistics Unit is important for early identification of markets accepting counterfeit or non standard vouchers. Private retailers generally return coupons quickly in order to receive payment, but ADMARC and SFFRFM have been much slower at this. Records on voucher returns by ADMARC and SFFRFM during the season are not available before 2007/8, but performance has improved in 2008/9 (see table 4).

As noted earlier overall ***costs*** of the programme have been over budget and increasing. This is due to a combination of increasing subsidy volumes, increasing prices, and failures by ADMARC to return to the programme the monies paid by farmers when redeeming their coupons.

[1] These variations in targeting are due to the vagueness in the definition of target beneficiaries in the guidelines which meant that those that were targeting beneficiaries placed different emphasis on different criteria and hence on different categories of smallholder farmers.

Table 5: Fertiliser and Programme Costs

	2005/6		2006/7		2007/8		2008/9	
	planned	actual	planned	actual	planned	actual	planned	actual
Total fertiliser cost of parastatal purchases (MK/mt) **		55,000		68,600		83,990		185,016
Fertiliser cost delivered at depots (MK/mt) **		n/a		63,560		77,748		179,094
Fertiliser transport costs etc exc ADMARC ohead (MK/mt)		n/a		5,040		6,242		5,922
Fertiliser cost, private retailers (MK/mt)		n/a		68,600		85,708		n/a
Overall fertiliser cost MK/mt ***		55,000		68,600		82,665		174,148
Malawi Government expenditure	5,100	7,200	7,200	11,398	10,300	15,349	17,780	tbc
Donor expenditure	0	0	1,756	1,331	800	998	1,700	tbc
Total programme cost (MK million)	5,100	7,200	7,500	12,729	11,500	16,346	19,480	tbc
Total Programme cost net of farmer redemption (MK million) - recovery unknown		4,480		10,346		13,361		tbc
Programme cost (US$ million)	36.4	51.0	53.6	74.0	82.1	115.0	139.1	tbc
Programme cost as % national budget	4.3%	5.6%	5.4%	8.4%	6.7%	8.9%	8.5%	tbc
Programme cost as % GDP		2.1%		3.1%		3.4%		tbc

** excluding buy back brought forward.
*** including buy back brought forward.
2005/6 fertiliser costs may also include some seed & coupon production/ distribution.
Donor costs for 2007/8 and 2008/9 for seed & Logistics Unit, buyback – information on government transport and operational costs is not currently available.

Sources: Logistics Units reports; 2005/6 (CISANet), 2006/7 (SOAS et al) and 2007/8 (MoAFS) evaluation reports; GoM budget statistics.

Data on estimated per unit fertiliser costs and on total programme costs are given in table 5, excluding ADMARC overhead costs. Both fertiliser prices and transport costs have been rising. Estimated per unit total fertiliser cost increases from 2005/6 to 2006/7 (25%) are higher than would be expected from international prices which were static over the same period, but from 2006/7 to 2007/8 (22%) are lower than would be expected from international prices, which rose by around 50% or more – so that the cost increase from 2005/6 to 2007/8 is in line with international price increases. Marked monthly variation in international fuel prices in mid to late 2006 and 2007 makes it difficult to undertake equivalent analysis for transport costs. Fertiliser cost increases from 2007/8 to 2008/9 also appear to be roughly in line with increases in international price increases over the same period (about 125%).

There have been substantial cost overruns in the implementation of the programme. For example, in 2005/06 the programme spent 41% above the budget and this increased to just under 70% in the 2006/07, declined to 42% in the 2007/08 season and is over 100% in 2008/9. The high cost overrun in 2006/07 is partly due to poor budget provision, as there were modest increase in volumes and lower costs of fertilizers compared to 2007/08. As a proportion of total government expenditure the subsidy increased from 5.6% in 2005/06 to 8.4% in 2006/07 and 8.9% in 2007/08. With substantial increases in the cost for 2008/09, actual expenditure on the subsidy rose to more than 17% of total government expenditure. As a proportion of GDP subsidy programme costs have risen from 2.1% in 2005/06 to 3.4% in 2007/08 and to 7.4% in 2008/09. However, these costs may fall if ADMARC and SFFRFM remit the farmer's redemption price to government.

5.4 Outputs and impacts

Major outputs and impacts of the programme involve incremental crop production, household food security, household incomes, export earnings (or import savings), effects on the Malawian input supply industry, and wider macro-economic effects. These issues were formally examined in the independent evaluation of the 2006/7 programme and table 6 presents findings from that evaluation with some extrapolation to the 2005/6 and 2007/8 programmes.

The major objectives of the subsidy have been to achieve food self-sufficiency and increased income of resource poor households through increased food and cash crop production. Increased production results from incremental use of inputs (mainly fertilisers and seeds) leading to increased yields, moderated by the yield response to these inputs which depends upon the weather and the efficiency of input use and crop production. Incremental input use (the extra input use caused by the subsidy) is equal to the increase in input use in a subsidy year adjusted by any changes in input use that would have happened anyway without the subsidy, as a result of changes in input prices, output prices, and farmers' access to seasonal finance. Constant annual changes in input and output prices and in access to seasonal finance make this difficult to estimate. Table 6 shows incremental fertiliser use estimates for 2005/6 and 2006/7 and predictions for 2007/8 and 2008/9, assuming similar implementation in these years[2].

[2] Displacement for 2005/6 and 2006/7 were estimated at around 25% and 35% respectively, and 2007/8 is assumed to have similar displacement to 2006/7 (higher subsidy sales may increase displacement but greater farmer familiarity and higher fertiliser prices would be expected to reduce displacement). A lower displacement of 25% is assumed for 2008/9 as a result of much higher fertiliser prices and earlier (separate) beneficiary registration. These will be investigated further in the evaluation study.

Table 6: Programme output and impact indicators

	2005/6		2006/7		2007/8		2008/9*	
	planned	actual	planned	Actual	planned/ expected	actual	planned/ expected	actual
Incremental fertiliser sales as % of subsidy sales		70-80%		60-70%	60-70%	n/a	70-80%	n/a
Incremental fertiliser sales (mt)		104,000		115,000	140,000	n/a	151,700	
Incremental maize production (MT)		570,000		670,000	816,000	n/a	884,000	??
	May-Oct06	Nov06-Apr07	May-Oct07	Nov07-Apr08	May-Oct08	Nov08-Apr09	Jul 09	Dec-09
Domestic maize prices (MK/kg)	19.5	20.0	16.7	34.1	47.1	60.8	34.2	
SAFEX maize prices (MK/Kg)	25.5	30.0	35.0	34.7	32.6	24.5	26.7	26.7
SAFEX import parity (MK/kg) **	39.5	44.0	49.0	48.7	46.6	38.5	40.7	40.7
Maize price in BC & fiscal efficiency analysis		20.0		21.6	35.0			tbc
Fertiliser price in analysis		55,020		68,600	82,600			tbc
Benefit cost ratio: high response		1.38		1.30	1.90			tbc
Benefit cost ratio: moderate		1.12		1.06	1.54			tbc
Benefit cost ratio: low response		0.86		0.81	1.18			tbc
Fiscal efficiency: high response		0.76		0.44	1.13			tbc
Fiscal efficiency: moderate		0.24		0.08	0.68			tbc
Fiscal efficiency: low response		negative		negative	0.22			tbc
Private sector fertiliser subsidy tender deliveries (mt)		70,000		99,386		97,845		162,840
Private sector fertiliser subsidy tender deliveries (%)		48%		72%		71%		88%
% fertiliser retail by private sector	0%	0%		28%		24%		0%
	2005		2006		2007		2008	
Poverty incidence	50%		45%		40%		tbc	
Wasting % U5s	6.8%		6.8%		5.8%		tbc	
U5s Severe underweight	6.4%		6.3%		4.9%		tbc	
Meals per day	2		2.15		2.3		tbc	

* 2008/9: Information on costs not yet available

** SAFEX import parity = SAFEX price plus MK14/kg.

Benefit cost ratio: Gross incremental benefits divided by gross incremental cost, valued at social prices

Fiscal efficiency: net economic benefit divided by fiscal cost.

Sources: Logistics Units reports; 2005/6 (CISANet) and 2006/7 (SOAS et al) evaluation reports, FNSP M&E 6th report draft, NSO.

Estimated incremental fertiliser sales increased from 2005/6 to 2006/7 despite an increase in displacement rates, due to increased subsidy volume, and a further increase is estimated for 2007/8 if displacement rates were kept down. Estimated incremental fertiliser sales as a result of subsidy sales in 2008/9 are higher than in 2007/8 as a result of higher sales and anticipated reduction in displacement due to high fertiliser prices and improved registration and allocation procedures.

Incremental fertiliser sales should lead to incremental maize production, depending upon rainfall, crop variety and management, including timing of planting, weeding, timing and methods of fertiliser application, and soil fertility. Assuming a moderate response to fertiliser of 15kg grain per kg of N (with reasonable weather in all four years), there should be a rise in incremental maize production across the four years (not allowing for transfer of fertiliser to cash crops). National smallholder crop estimates suggest very large maize production increases from 2005 to 2006 and 2007, a fall back in production, area and yields in 2008, and another large increase in 2008/9. Estimates of smallholder tobacco production show a decline in production between 2005/06 and 2006/07 but a 44% increase in the 2007/08 season. The increase in production was accompanied by increases in auction prices by 92% between 2006/07 and 2007/08. Following better tobacco prices last season there are reports of increased registration of smallholder tobacco farmers and increased volumes of tobacco coming to the auction floors. There is however no evidence from preliminary survey results of any net diversion of maize fertilizers to tobacco. Crop estimate cotton yields in 2008 have increased slightly over 2007, though by less than the increase in 2007 over 2006. In relating these estimates to subsidy impacts there are questions about the effects of rainfall, storage losses and other aspects of crop management and about reliability of data.

Estimated increased maize production in 2007 led to authorisation of export of 400mt of grain to Zimbabwe, and subsequent exports of 330mt, but the price and value of these exports has been difficult to ascertain. Increased maize production would be expected to lead to falling maize prices. This was observed in 2006/7 (following the 2005/6 harvest) but not in subsequent years, which have seen rising prices. Reasons for this may include some combination of smaller than estimated production gains, storage losses, exports, rising international prices and a generally thin domestic market in maize (with the vast majority of maize produced not entering the market).

The economic returns to the programme depend upon the economic price of maize, the price of inputs, and production responses to increased input use. Benefit : cost ratios estimated for the 2006/7 programme showed that the net economic return to the project is very sensitive to maize prices and the production response, and with reasonable variation in assumptions could range from 0.76 to 1.36 with a mid estimate of 1.06. Adjustments to this analysis using estimated maize and fertiliser prices for other programme years suggest that both the 2005/6 and 2007/8 programmes should have yielded equivalent or higher returns, but the very high fertiliser prices that prevailed when fertilisers were being purchased for the 2008/9 programme and the subsequent fall in maize prices (and hence fall in the value of the output) will adversely affect returns in 2008/9, irrespective of any changes in implementation. Fiscal efficiency estimates (net economic benefit per unit fiscal investment) show a similar pattern to economic returns, but are also (negatively) affected by high rates of displacement of unsubsidised sales by subsidised sales, as these lower the net benefit from the costs of subsidised sales. The key conclusions from the benefit cost and fiscal efficiency analysis are that (a) economic returns are highly sensitive to the yield response to fertiliser, (b) fiscal returns are highly sensitive to displacement rates, and (c) with good programme implementation and good (but achievable) yield responses to fertiliser the programme can be a very good investment. It is therefore critical that programme design and implementation deliver low displacement and high responses to inputs.

While economic cost benefit and fiscal efficiency analysis can yield valuable information about programme efficiency, they can be misleading when examining the contributions of the programme to poverty reduction, growth and food security. This arises because although high maize prices increase the estimated economic return of the programme, high domestic maize prices are damaging to household food security for food deficit households and depress real incomes for food buyers. High food prices are therefore likely to depress poverty reduction, growth and nutritional benefits from the programme. As noted earlier, domestic maize prices fell following the introduction of the programme in 2005/6, but have subsequently been rising. Preliminary analysis of first round data collected in the 2008/9 evaluation study show that rural wages have been increasing faster than maize prices, and hence real incomes of both deficit and surplus producers have been increasing. Poverty rates are estimated to have fallen over the last few years, and wasting has also declined. Attribution of these changes to the programme is difficult, but greater food availability and access as a result of the programme should have contributed to these gains, and the geographical pattern of wage rate changes observed in 2008/9 are consistent with modelling of subsidy programme impacts in the 2006/7 evaluation study.

The large size of the programme could be expected to have macro-economic impacts. There was no evidence of this in 2006/7, in the context of sound macro-economic management and wider growth in the economy. The situation may have changed in 2008/9 with the dramatic increase in costs as a result of high fertiliser prices.

The programme also has major impacts on private sector input suppliers. Fertiliser importers have been responsible for generally increasing proportions and volumes of government subsidy sales, with particularly large volumes in 2008/9. However the exclusion of private sector companies from retail subsidy sales in 2005/6 led to substantial falls in sales from retail outlets. These recovered in 2006/7 and 2007/8 with the inclusion of larger chains in retail subsidy sales, but falls in retail outlet fertiliser sales are reported in 2008/9. Information on the effect of an attempt in 2007/8 to promote the private fertiliser sales in more remote EPAs is not currently available**.** Small agrodealers have been excluded from subsidised fertiliser sales but appear to have benefited from involvement in subsidised seed sales.

6 Challenges

Consideration of the achievement and impacts of the programme from 2005/6 through to implementation of the 2008/9 highlight a number of challenges for programme design and implementation.

Most importantly, there are serious questions as regards cost control and sustainability of the programme as a result of its burgeoning cost (particularly in 2008/9, with the very high global fertiliser prices in mid 2008) and increasing demand on the national budget (see table 5). While fertilizer prices have increased, farmers' redemption prices have fallen, so subsidies per farmer have increased substantially. International fertiliser prices have since fallen back to prices similar to those of late 2006, but international and SAFEX maize prices have also fallen back, and the future of commodity prices is highly uncertain.

Increases in programme cost have not arisen only as a result of increased fertiliser prices, the scale and scope of the programme has also increased. Increases in scale are shown by budgeted subsidised fertiliser sales increasing by 24% from 2005/6 to 2008/9, and actual sales increasing by 65% from 2005/6 to 2007/8, though in 2008/9 they fell back a little from 2007/8). The scope of the programme has expanded with the introduction in 2007/8 and 2008/9 of flexi vouchers (for legume and cotton seed as well as maize), cotton chemicals and grain storage pesticides, and extension of the programme to support tea and coffee farmers in 209/10.

Concerns about the sustainability, cost, scale and scope of the programme require particular attention to effectiveness and efficiency. This raises questions about the objectives and impacts of the programme, the targets it needs to meet, and aspects of design and implementation which are the most important determinants of effectiveness and efficiency in meeting those targets.

7 Ways forward

It is important that if the considerable achievements of the programme from 2005/6 are to be built on and the current challenges addressed, then a number of wide ranging and important questions need to be considered, about programme objectives and outcomes, about implementation systems, and about complementary policies.

Tables 7, 8 and 9 map out some of the options facing policy makers and programme management, and the strengths and weaknesses of different options in contributing to different aspects of programme efficiency and/or effectiveness. Contributions to programme efficiency and effectiveness are represented by scores. Some contributions will be very context dependent, for others there is a limited empirical base. These tables are therefore not intended to be definitive, but are put forward to stimulate analysis, discussion and debate as regards both ongoing decisions about the programme and about topics needing further information and/or analysis. '+' and '-' indicate positive and negative contributions, while underlining indicates a dominant contribution driving other contributions

Table 7 sets out 4 key issues (targeting, scale, scope and technical package) which have significant effects on all the major objectives or potential objectives of the programme. These are impacts or potential impacts which fit within broader government goals (as for example in the MDGS): household food security, agricultural productivity, input market development, social protection, poverty reduction, nutrition, rural incomes, and soil fertility replenishment. Different options regarding the key four key programme issues are listed, and for each of these broader considerations stated, and then each option is scored against each impact or potential impact, the scorings representing likely contributions of the programme if it incorporated this option. Scorings necessarily involve simplifications and judgements: impacts will depend upon synergies and complementarities and trade-offs between different options, and upon specific circumstances. Nevertheless the table provides a useful summary and framework for policy and management analysis and decisions.

Table 8 considers issues more concerned with the implementation of the programme and their outcomes on programme costs and effectiveness. Private sector roles and systems are considered here although the role of the private sector is a very major policy issue affecting programme impacts, particularly input market development, and thus warrants inclusion in table 7. Input market development is therefore explicitly considered here (as in table 7) as a criterion against which different options are judged. Other issues considered (in addition to private sector roles) are voucher systems; beneficiary selection and registration and coupon distribution systems; planning and management information; and cost control systems. Criteria on which these are scored are contributions to input market development (as noted earlier); effectiveness; capital, input and administrative cost saving; reduction or control of subsidy diversion to other uses or recipients; reduction or control of fraud; and reductions in farmer costs in accessing subsidised inputs.

Finally Table 9 considers the roles of complementary policies in furthering the effectiveness of the programme in achieving the objectives / impacts outlined earlier for table 7. Complementary polices that are important here are considered to be maize market policy, infrastructure development, research and extension, promotion of organic soil fertility, and social protection. Macroeconomic management and policy is not considered here but has wide and overarching impacts on the programme.

Table 7. Key issues affecting major programme objectives

			IMPACTS							
			Main	**Other National Level**						
			Household food security	Agric. Prod-uctivity	Input market dev.	Social prot-ection	Poverty red-uction	Nutrition	Rural incomes	Soil fertility replen-ishment
Issues	**Options**	**Considerations**								
Targeting	Universal but smaller packages	Most transparent & straight forward in practice, moderate displacement, informally being practiced	++	++	+	++	++	+	++	+
	Poorest and vulnerable households	Low displacement in theory ...,	++	++	++	++	++	++	++	++
		..but difficult in practice	?	?	?	?	?	?	?	?
	Most productive households	Higher displacement, higher fiscal inefficiency	0	0	--	0	0	0	+	0
	Fixed cohort of households over time	Reduced administration costs, politically difficult; extra benefits only if well targeted	+	+	+	+	+	+	+	+
	Between communities	Links to crops in different areas, politically difficult	+	+	+	+	++	+	++	+
Scale	Reduced households	Reduced costs, achievements change with method of targeting, radical cuts will lose market benefits								
	Reduced package size per household	Reduced costs, reduced displacement?	+	++	+	+	+	+	+	+
Scope	Only target food crops - maize and legumes	Reduced in costs, low to medium displacement	++	+	++	++	++	++	++	++
	Include cash crops - tobacco, cotton, tea and coffee etc	Increased costs, higher displacement; effects will differ between crops	+	+	-	+	+	?	+	+
Technical package	District based fertiliser recommendations	Technical efficiencies; input costs; reduced bulk discounts; increased management costs	++	**++**	+	++	++	++	++	++
	Improved maize seed:fertiliser ratio	Technical efficiencies; reduction in input costs	++	**++**	+	++	++	++	++	++
	Replacement of 23:21:0	Reduced input costs								

Table 8. Programme implementation issues and outcomes

			IMPACTS/ OUTCOMES							
			Input market development	Effectiveness	Capital costs savings	Input costs savings	Administrative costs savings	Reduced diversion	Reduced fraud	Reduced farmer's access costs
Issues	**Options**	**Considerations**								
Private sector roles & systems	Increased private sector importation	Degree of competition, expertise and commitment	++	++	++	++	++	N/A	?	N/A
	Increased private sector retailing	Degree of competition, expertise and commitment; auditing systems	++	++	++	?	+	?	+	++
	Increased agro-dealers participation	Capacity building, expertise and commitment; financing; coordination	++	+	+	?	+	?	+	++
	Remote area incentives	Relative efficiencies, low displacements	++	++	++	?	0	?	+	++
Voucher system	Security systems (printing, bar codes, smart cards, scratch cards)	Rural & system infrastructure (eg power, telecoms); acceptability; specificity versus flexibility	++	++	0	0	0	?	+	?
	Flexi/Fixed price vouchers	Availability of different inputs; stocking uncertainty; nature of inputs	++	++	0	0	0	-	?	++
Beneficiary selection, registration, coupon issue	TAs, ADD staff, local government	Related to targeting, scope & voucher systems. Stakeholder interests, timing; local acceptability	N/A	?	N/A	N/A	?	?	?	?
	Open meetings (wealth ranking approach)	Facilitation, local acceptability, culture, power structures	N/A	+	N/A	N/A	-	+	+	?
	Earlier Timing	Input and cash/credit planning by stakeholders; government budget timing	+	+	N/A	+	+	?	?	+
Planning & management information	Farm families	Other information systems & needs, resources	N/A	+	N/A	+	+	+	?	+
	Crop production and consumption	Other information systems & needs, resources; methodologies	++	++	?	+	?	?	?	?
	Market flows	Other information systems & needs, resources	++	++	?	+	?	?	?	?
Cost control	Planning, budgeting, monitoring	Related to almost all issues above. Voucher security & control.	+	+	+	+	+	+	+	+

Table 9. Complementary policies affecting programme outcomes

			IMPACTS							
			Main	Other National Level						
			Household food security	Agricultural productivity	Input market development	Social protection	Poverty reduction	Nutrition	Rural incomes	Soil fertility replenishment
Policies	**Options**	**Considerations**								
Maize markets	Floor & ceiling prices; private & public roles & relations	Programme objectives; policy objectives, trade-offs and complementarities; stakeholder interests	**++**	+	+	++	++	++	++	+
Infrastructure	Road access for input & output markets & wider development	Investment trade-offs & complementarities: costs, returns & time scales; stakeholder interests	+	+	++	+	+	+	++	+
Research & Extension	Investments to maintain & raise soil, crop & input productivity	Investment trade-offs & complementarities: costs, returns & time scales; stakeholder interests; MoAFS policies	++	**++**	+	+	+	+	+	++
Organic soil fertility	Complementary investments raise return to inorganic fertiliser	Investment trade-offs & complementarities: costs, returns & time scales; stakeholder interests; MoAFS policies	+	**++**	+	+	+	+	+	**++**
Social protection	integrated / separate policies of food & cash transfers	Investment trade-offs & complementarities: costs, returns & time scales; stakeholder interests; GoM policies & coordination	++	+	+	**++**	++	++	+	?

Annex: benefit cost and fiscal efficiency analysis

	2005/6		2006/7		2007/8	
	May-Oct06	Nov06-Apr07	May-Oct07	Nov07-Apr08	May-Oct08	Dec08-Mar09
Domestic maize prices (MK/kg)	19.5	20.0	16.7	34.1	47.1	
SAFEX maize prices (MK/Kg)	25.5	30.0	35.0	34.7	32.6	23.2
SAFEX import parity (MK/kg)	39.5	44.0	49.0	48.7	46.6	37.2
Maize price (MK/kg) in analysis	20.02		21.56		35	
Fertiliser price (MK/mt) in analysis	55,020		68,600		82,600	
Maize price ($/mt) in analysis	143		154		250	
Fertiliser price ($/mt) in analysis	393		490		590	
Displacement	25%		35%		35%	
B:C Ratio - high grain response	1.38		1.30		1.90	
B:C Ratio - medium grain response	1.12		1.06		1.54	
B:C Ratio - low grain response	0.86		0.81		1.18	
Fiscal efficiency - high grain response	0.76		0.44		1.13	
Fiscal efficiency - medium grain response	0.24		0.08		0.68	
Fiscal efficiency - low grain response	negative		negative		0.22	

* 2008/9: Benefit cost ratio and fiscal efficiency cannot be usefully calculated until cost figures can be confirmed.
** SAFEX import parity = SAFEX price plus MK14/kg.
Benefit cost ratio: Gross incremental benefits divided by gross incremental cost, valued at social prices
Fiscal efficiency: net economic benefit divided by fiscal cost.
2006/7 as in evaluation report: other years use 2006/7 data (eg input volumes) but amend maize and fertiliser prices (including farmer payments)