

The Farm Input Subsidy Programme (FISP) 2009/10:

A review of its implementation and impact

Andrew Dorward and Ephraim Chirwa
November 2010

Summary

This report reviews the 2009/10 implementation of the Farm Input Subsidy Programme 2009/10 in the context of experience from 2005/6 to 2008/9.

The 2009/10 programme differed from previous years in restriction of fertiliser subsidies to maize production, reduced fertiliser distribution budgets which were also adhered to, large increases in maize (particularly hybrid) and legume seed distribution, considerable carry forward of fertiliser stocks from previous year purchases, and earlier sales of fertiliser. These changes all have important positive implications for the programme's effectiveness and efficiency as a result of reduced displacement, improved targeting, reduced programme costs (which also benefited from lower fertiliser prices), improved returns to use of subsidised fertiliser on hybrid maize, and food security, diversification and soil fertility benefits from the increased legume seed sales. Increased maize and legume seed sales through private retailers should also stimulate input market development. The economic benefit cost ratio for the programme is estimated at 1.12, a respectable result (despite the many difficulties with this analysis and its blindness to many longer term and intangible benefits) with considerable potential for further improvement. The macro-economic costs of the programme have also been substantially reduced as compared with the previous year and the year on year rises in costs halted.

These are important achievements.

There are two main areas where it is proposed that programme implementation could look for substantial improvements in the future: first in achieving greater transparency in beneficiary identification and coupon issues and second in allowing earlier sales of inputs.

Greater transparency in beneficiary identification and coupon issues should build on achievements over the last four years (for example in improved targeting and use of open meetings) by (a) resolving inconsistencies both in changing MoAFS farm family numbers across regions and with NSO estimates, (b) improving effective communication about coupon allocation and distribution systems, (c) increasing the transparency and accountability of these processes with, for example, the involvement of different stakeholders representing farmers, and (d) sharing and implementing good practice in particular districts or areas more widely across the country.

Earlier input sales are important for reducing the costs and risks faced by farmers in redeeming coupons, promoting higher yield responses from earlier planting and fertiliser application, reducing pressures and costs in fertiliser deliveries to markets, and giving farmers more voice and choice when redeeming coupons. This requires that the 2009/10 improvements in fertiliser deliveries and in seed contracting are sustained and accompanied by earlier finalising of coupon allocations and printing than in 2009/10 – as has already been recognised by strenuous attempts to achieve earlier commencement of sales in 2010.

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1 Introduction

The 2009/10 agricultural season is the fifth year in which the Malawi Government has implemented its national farm input subsidy programme. This paper presents information on the design and implementation of the programme, including its costs, with indicative information on its impacts in terms of incremental production. The purpose of the paper is review the 2009/10 programme (in the context of experience from 2005/6 to 2008/9) and raise issues for further examination in the review and evaluation of the 2010/11 programme.

The paper is the first of a series of papers being prepared in a programme of work from November 2010 to June 2011. Subsequent papers will discuss lessons from earlier studies on production estimation methodologies, targeting, and gender impacts, consider wider growth and other contributions of the subsidy programme, and, following field work in early 2011, provide a review of the 2010/11 programme and consider potential for the application of the concept of 'graduation' in the future development of the programme.

The paper draws upon the following principal sources of information:

- 2009/10 Final report of the Logistics Unit – the major source of 2009/10 information
- Logistics Unit Weekly reports
- Various monitoring reports by FUM and MEJN
- Earlier evaluation reports
- MoAFS FISP Implementation Guidelines

Following this introduction the report provides a detailed consideration of 2009/10 programme implementation and outputs, with a comparison of the 2009/10 programme with previous years. The conclusions detail the main achievements, issues and challenges in the 2009/10 programme and sets out some recommendations for future design, implementation, monitoring and evaluation.

2 Programme design and implementation

2.1 Programme objectives and overall design

The objectives of the programme are to improve national and household food security and self sufficiency and incomes through increased food and cash crop production and productivity as a result of improved accessibility and affordability of agricultural inputs among the most vulnerable farmers.

The core of the FISP is the transfer to selected rural households of a coupon which is intended to benefit them by enabling them to increase their use of agricultural inputs (principally fertiliser and seed). However if beneficiaries choose to sell the coupon or if they use it to finance the purchase of inputs that they would have purchased anyway then the receipt of a coupon effectively gives them a cash transfer with, in the former situation where coupons are sold, buyers of coupons and of inputs taking a share of that transfer.

Major elements of the programme are summarised below in figure 1.

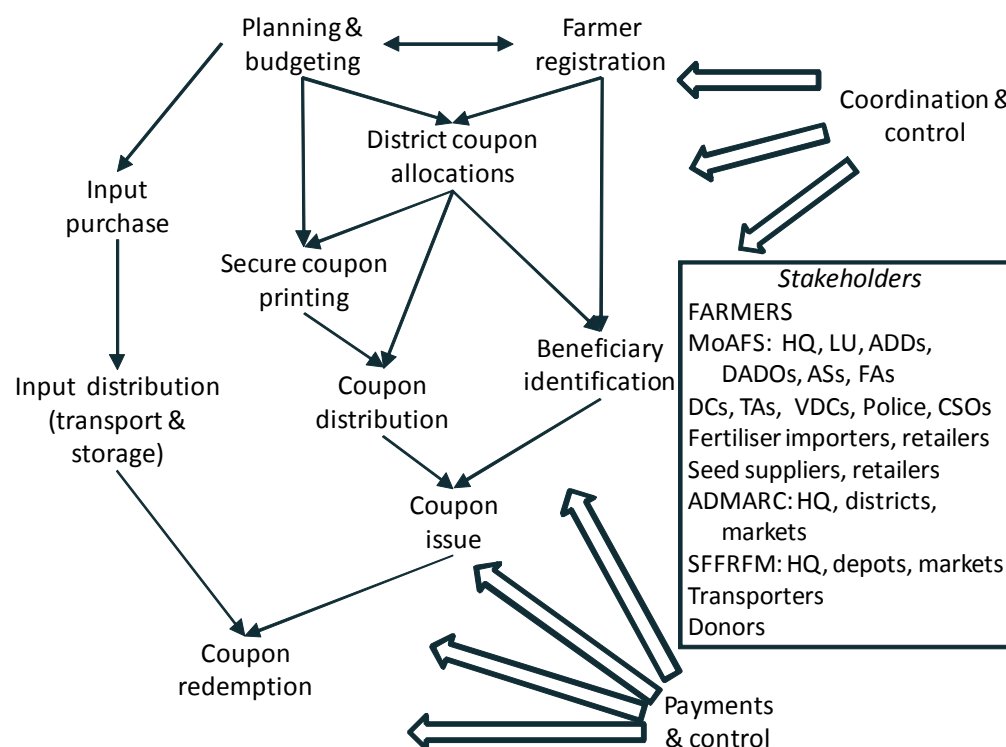


Figure 1. Major elements of FISP

The implementation of each of these elements is discussed in more detail below but it is important to note here the complexity of the programme as regards (a) the number of different activities involved (b) the complex relationships between these activities, in particular with regard to their timing, and (c) the number of different stakeholders involved with different interests in different activities.

The 2009/10 programme differed from the previous year in a number of ways:

- Subsidised fertiliser was intended and targeted for use only on maize (no supplies were budgeted for other crops)
- The targeted volume of subsidised fertiliser was reduced
- No subsidies were provided for crop protection chemicals apart from grain storage chemicals (but information is not currently available on their disbursement or costs)
- Volumes of subsidised seed (both maize and legume) were considerably increased as compared with previous years, with separate coupons and larger quantities of hybrid and OPV seed provided per coupon (5 and 10kg per pack respectively as compared with 2 and 4kg per pack in 2008/9).
- Beneficiaries were required to have voter ID cards from the 2009 elections
- There were considerable fertiliser stocks carried forward from purchases the previous year

Main changes in programme design and implementation over the life of the programme are detailed in table 1 while table 2 summarises the main programme achievements by year over the same period.

Table 1: Principal changes in programme design and implementation, 2005/6 to 2009/10

	2005/6	2006/7	2007/8	2008/9	2009/10
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	Maize fertilisers only; More maize seed (hybrid & OPV) per pack; Legume seed. No fertilisers or chemicals for cash crops. Not over budget. Large buyback.
Coupon 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	District allocation by farm hh & areas; use of farm household register, open meetings for allocation & disbursement led by MoAFS Voter registration numbers & ID required for registration, receipt & redemption
Coupon redemption systems	Only through SFFRFM & ADMARC	Fertilisers also through major retailers; flexible maize seed coupons through wide range of seed retailers	Fertilisers also through major retailers; flexible maize & legume seed coupons through wide range of seed retailers; cotton inputs through ADDs	Fertilisers only through ADMARC & SFFRFM; flexible maize & legume seed coupons through wide range of seed retailers; cotton inputs through ADDs	Fertilisers only through ADMARC & SFFRFM; separate maize & legume seed coupons through retailers, variable top up for maize seed max MK100
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 buyback or remote EPA premium. ADMARC computers for coupon processing	Complex extra coupon security features in Centre & North. Features (eg numbering) varied. Significant fertiliser buyback & other carry forward from 2008/9.

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

Table 2 Summary of 2005/6 to 2009/10 programme implementation

	2005/6	2006/7	2007/8	2008/9	2009/10
Fertiliser coupon distribution (mt equivalent)	166,156	200,128	216,000	195,369	160,000
Households receiving one or more fertiliser coupons	n/a	54%	59%*	65%	n/a
Subsidised 'maize' fertiliser (mt)	108,986	152,989	192,976	182,309	159,585
Subsidised 'tobacco' fertiliser (mt)	22,402	21,699	23,578	19,969	0
Total subsidised planned	137,006	150,000	170,000	170,000	160,000
fertiliser sales (mt) actual	131,388	174,688	216,553	202,278	159,585
Redemption price (MK/50 kg bag)	950**	950	900	800	500
Coupon value, approx (MK/bag)	1,750	2,480	3,299	7,951	4,891
Subsidy % (approx)	64%	72%	79%	91%	91%
Subsidised maize seed (MT)	n/a	4,524	5,541	5,365	8,652
% Hybrid seed	0%	61%	53%	84%	88%
Cotton seed (mt)	0	0	390	435	0
Legume seed (mt)	0	0	24	n/a	1,551
Cotton chemicals coupons	0	0	131,848	n/a	0
Total programme cost net of farmer redemption (MK million)					
Govt budget	5,100	7,500	11,500	19,480	19,400
Actual total (inc donor costs)	4,480	10,346	13,361	33,922	15,526

Note: Planned quantities of seed are not available: in 2009/10 1.6 million maize seed coupons and 1.6 million legume seed coupons were issued, but seed purchases depended upon seed availability, pack sizes, and farmer choice
Reporting of some financial costs varied between years, and budget costs exclude some costs included in actual costs (eg seeds).

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

The 2009/10 achievements summarised in table 2 are discussed in more detail in the following sections which consider the main determinants of the effectiveness and efficiency of the programme: volumes of subsidised inputs, timing of activities, beneficiary access, and costs.

2.2 Volumes of subsidised inputs

As mentioned earlier and shown in table 2, there were some marked changes in subsidy volumes in 2009/10 as compared with previous years:

- In previous years subsidised fertilisers had been provided for tobacco (and in 2008/9 coffee and cotton) but in 2009/10 fertilisers provided were intended only for maize.
- Budgeted volumes of fertiliser had increased steadily from 2005/6 to 2008/9 but were reduced in 2009/10
- Actual disbursements had exceeded budgeted disbursements from 2006/7 to 2008/9, and had been less than budgeted in 2005/6, but matched budgeted disbursements in 2009/10
- Maize (and particularly hybrid) seed sales increased dramatically
- Legume seed sales increased dramatically (they were not part of the 2005/6 programme while seed shortages severely limited disbursement in other years).

These changes are shown graphically in figure 2. They all have important positive implications for the programme's effectiveness and efficiency:

- The focus on maize should reduce displacement and improve targeting (as argued in our previous evaluation reports)
- The reduced volumes of fertiliser disbursed – as a result of both smaller budgeted volumes and adherence to the budget – should both reduce displacement and control programme costs (as discussed later under programme costs).
- The increased maize and hybrid seed sales should improve the returns to use of subsidised fertiliser (as discussed later under programme impacts)
- The increased legume seed sales should contribute to food security objectives of the programme, encourage diversification, and have wider soil fertility benefits, complementing inorganic fertiliser use.
- Increased maize and legume seed sales through private retailers should stimulate input market development

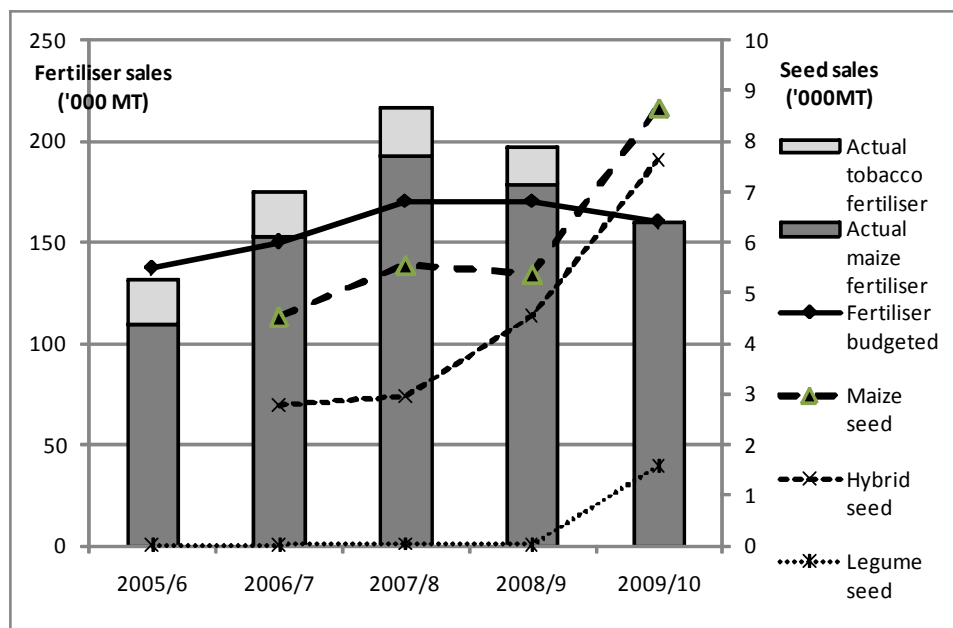


Figure 2 Subsidised fertiliser and seed sales

We consider regional changes in subsidised fertiliser sales in section 2.4.

2.3 Timing of subsidy sales

The timing of subsidy sales is important as late sales can reduce the benefits of input use (from late planting and fertiliser application) and also take away farmers from working on their fields while they acquire inputs. Late acquisition may also depress unsubsidised and total input sales if farmers who would buy unsubsidised inputs hold back while they wait to see if they will be able to get subsidised inputs. The timing of subsidy sales is however determined by the timing of availability of inputs in markets and by the timing of issue of coupons 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, coupon allocations, coupon printing, coupon distribution to districts, and district distribution payments. Information on some of these variables is given in table 3 and figure 3. These show a generally good record as regards fertiliser and seed logistics and sales, with improvements as compared with previous years, but not such a good record as regards coupon processes. We discuss these in turn.

Table 3: Performance indicators: timing of contracts, coupon processes and sales.

		2006/7	2007/8	2008/9	2009/10
Coupon distribution					
District coupon allocations		early Sept	9th Oct	12th Sept	15th Sept
Coupon printing		end Sept	end Oct	SR early Oct CR/NR mid Nov	SR end Oct CR/NR mid Nov
Coupon & lists distribution to districts		virtually completed 7th November	virtually completed 3rd November	virtually completed 18th November	virtually completed end November
Fertilisers					
Tender awards for parastatal supplies		late August	mid August	end July	mid August
Finalisation of retail fertiliser contracts		early Nov	mid/late Nov	n/a	abandoned mid Sept
Regional depot receipts as % new contracts	end Oct	14%	35%	46%	52%
	end Nov	71%	62%	67%	94%
	end Dec	94%	85%	90%	103%
Outstanding payments (% & MK million)	end Oct	28% 1,216	22% 1,595	16% 3,500	13% 814
	end Nov	46% 4,303	13% 1,192	13% 3,690	11% 955
	end Dec	14% 1,406	21% 2,620	22% 7,707	6% 585
Uplifts despatched as % parastatal total sales	end Nov	64%	70%	75%	81%
	end Dec	96%	85%	91%	96%
Sales as % total season sales	end Nov	8%	n/a	33%	41%
	end Dec	74%	64%	72%	85%
	end Jan	96%	88%	94%	98%
SFRRFM/ADMARC coupon returns ('000)	end Nov	0	0	17	39
	end Dec	0	101	175	506
	end Jan	111	720	1,057	1,189
Seeds					
Finalisation of seed supply contracts		mid/late Nov	mid/late Nov	early Nov	mid Sept
Seed coupons in LU as % season sales	end Nov	3%	1%	1%	2%
	end Dec	27%	4%	6%	23%
	end Jan	74%	18%	22%	53%

Sources: Logistics Units reports; 2006/7 (SOAS et al), and 2008/9 (Dorward et al) evaluation reports.

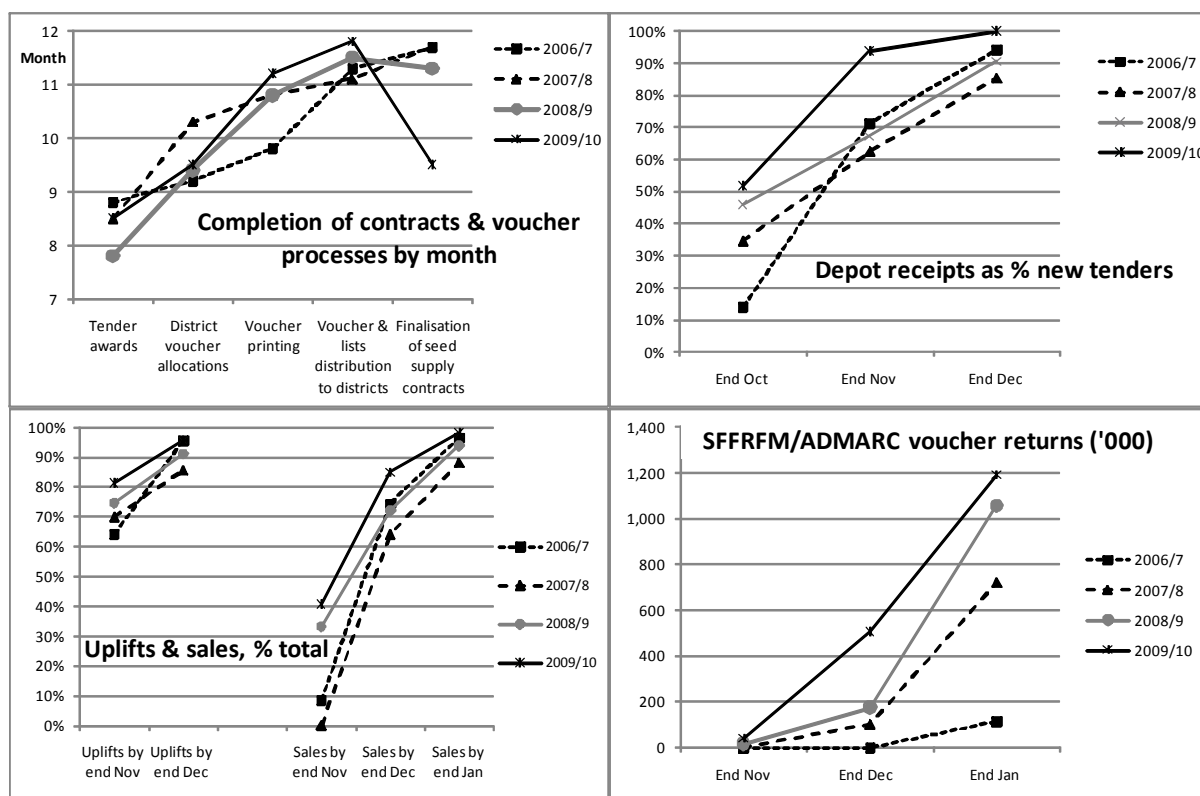


Figure 3 Timing of subsidy activities

The 2009/10 logistics of fertiliser supply were helped significantly by the large quantity of fertilisers carried over from the 2008/9 season – a little over 84,000 MT, of which it is understood 54,000MT were covered by a buyback agreement (LU, 2010). With the reduction in budgeted fertiliser sales this meant there was a substantial reduction in the quantity of fertiliser to be purchased under tender – down to 76,000MT. Tenders were called for on 16th April for submission by 1st June, and were awarded on 21st August. Since a number of suppliers had stocks in the country deliveries could and should have started immediately. However the available storage space was already occupied by the stock brought forward.¹ Movements between regional depots to match regional stocks to demand depended upon district allocations which were issued in mid-September. Further freeing of storage space depended upon the issuing of contracts to transporters and on available space in unit markets. Transport contracts were issued on 23rd September, allowing limited uplifting from late September, but this was limited by the space available at those markets until sales commenced at the end of October. Very rapid sales in November and December (roughly 65,000 MT (40% of total sales) per month) then placed very large challenges on fertiliser deliveries, exacerbated by fuel shortages at the end of November, leading to farmers facing considerable difficulties in accessing inputs (as discussed later in section 2.4).

However, despite these difficulties, table 3 and figure 3 show that depot deliveries, uplifts and sales were conducted earlier than in the three previous years. In addition payments to

¹ A further difficulty that arose as a result of the carry forward of fertiliser stocks from 2008/9 was that it included just over 1,100MT of D compound and CAN which were not required for the 2009/10 programme. Around 9,500MT of this were sold instead of 23:21:0 and Urea.

suppliers were more timely, and return of redeemed fertiliser coupons by ADMARC and SFFRFM was also improved.

The contracts for the supply of seeds were finalised in mid-September, very considerably earlier than in previous years. Very limited information is available on the timing of actual seeds sales. The Logistics Unit does, however, report on seed coupons submitted for redemption, and suppliers will normally try to submit these quickly since they are required for payment. Table 3 shows more rapid receipt of coupons in 2009/10 than in the previous two years. Percentage returns were higher in 2006/7 but since this was on a smaller number of coupons, absolute numbers of returned coupons were still higher in 2009/10.

As should be clear from figure 1 and from the discussion of the timing of fertiliser sales and logistics, the timing of input sales is very dependent upon the timing of issue of coupons to beneficiaries, and subsequent opening of the programme for sales. The issuing of coupons is itself dependent upon the prior printing of coupons and identification / registration of beneficiaries, and these activities are in turn dependent upon the overall budgeting and planning of the programme, farmer registration, and district allocations of coupons (see figure 1). Table 3 and figure 3 show that district allocations of coupons in mid September 2009 was at roughly the same time as in previous years, while printing of coupons and their distribution to districts were completed later than in previous years (opening of the programme is somewhat earlier than shown, but follows the same pattern).

When reviewing the timeliness of programme activities as a whole, the following points should be noted:

- There were marked improvements in the timing of fertiliser deliveries and finalisation of seed contracts which are highly commendable
- Some improvements in timing of fertiliser deliveries were aided by the availability of carry forward stocks from the previous year
- As in previous years late opening of the programme led to very large demand for sales in November, demand which could not be met.
- The large carry forward stocks could not overcome, and indeed in some ways exacerbated, problems of limited storage space due to late opening of sales.
- There would be very significant gains to farmers and the programme if sales could start earlier, and this requires earlier distribution of coupons to districts, with earlier printing, and this in turn requires earlier finalisation of district coupon allocations.

It may also be noted that even for activities implemented earlier than in previous seasons, their timing is still later than suggested in a schedule discussed in 2008. This proposed that coupon redemption and subsidised sales should run from May to December to allow farmers to purchase subsidised inputs over a much longer time period, starting from the previous season's harvest. This would require much earlier issue of tender documents (by the end of February) with awards in April and coupon distribution in April and May. While there may be difficulties with this timetable (for example the Government budget cycle), it emphasises the importance of earlier action, particularly on determination of district coupon allocation as this and coupon printing, which depends upon it, were critical in delaying the start of input sales in the 2009/10 season, with attendant high demand and stock out problems in November for farmers, unit markets, and fertiliser deliveries.

2.4 Beneficiary access

Beneficiaries' access to inputs is determined by coupon allocations and receipts and by their ability to redeem coupons, which may be affected by availability of subsidy inputs in accessible markets, by their ability to afford the costs of redeeming coupons (including time, travel costs, and any 'tips' paid when redeeming coupons). These factors interact, as limited allocations or shortages of inputs tend to increase the costs of redeeming inputs, particularly

for more vulnerable people who are important intended beneficiaries of the programme (the elderly, women, the sick and infirm, and children). Comprehensive information is not available on these topics: household surveys are needed to provide systematic information and no survey data are available for the 2009/10 season. We therefore consider information that is available and that can provide some indications of issues here: regional allocations of input coupons and input sales as compared with regional populations, and information from reports compiled by FUM and MEJN from monitoring of targeting, coupon redemption and input access at selected markets in selected districts.

We begin by considering the redemption of fertiliser coupons across the different regions as compared with the number of farm households in each region. Figure 4 shows the number of coupons redeemed per farm family and total coupon redemptions by region.

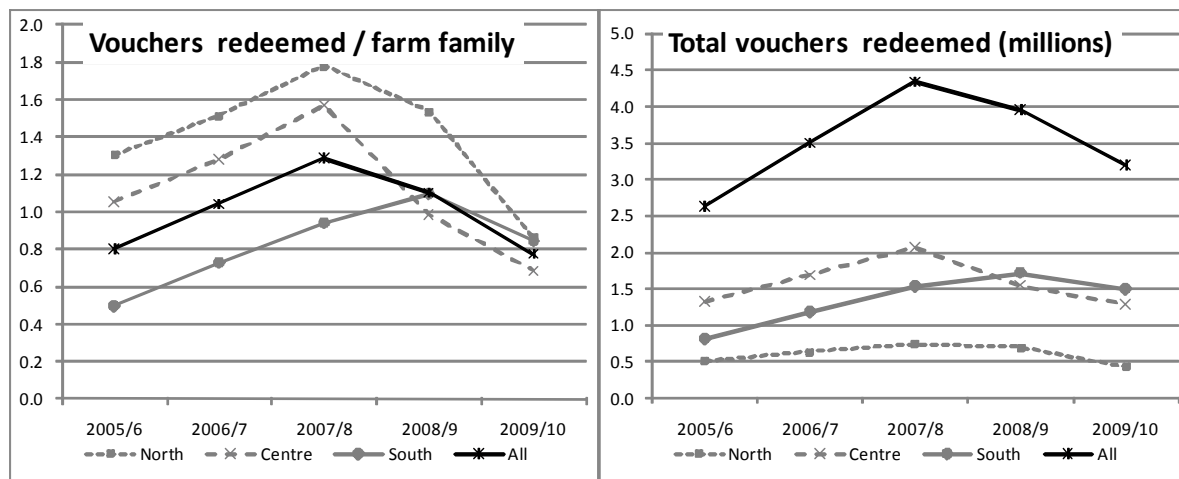


Figure 4 Fertiliser coupons redemptions by region

These graphs are of interest as they shed light on possible differing and changing availabilities of fertiliser coupons across the three regions. The right hand graph shows that total coupon redemptions increased in all regions from 2005/6 to 2007/8. They then fell back substantially in the central region in 2008/9 and less substantially in 2009/10, ending up in 2009/10 marginally below 2005/6 redemptions. The northern region shows a similar pattern, although the decline in 2009/10 was greater than the decline in 2008/9, and the overall decline from 2005/6 to 2009/10 was slightly greater than in the centre. The southern region experienced a similar rise in redemptions from 2005/6 to 2007/8, and this then continued in 2008/9, before falling in 2009/10, but ending up with 2009/10 redemptions a little less than double those in 2005/6. The left hand graph shows in some respects a similar pattern across the regions for coupon redemptions per household. However, the increases from 2005/6 to 2007/8 (or 2008/9 for the southern region) are less pronounced, and the falls to 2009/10 are much more pronounced, so that only for the southern region are redemptions per household greater in 2009/10 than in 2005/6. The discrepancies between these two graphs arise because of increases in the number of farm families estimated or (in the last three years) registered by MoAFS. These are shown in table 4.

Table 4 Farm families and households by year and region

	Number of farm families (MoAFS)					Increase 2005/6 to 2009/10	NSO 2008 Census total households
	2005/6	2006/7	2007/8	2008/9	2009/10		
North	387,583	n/a	477,979	478,645	501,723	29%	345,752
Centre	1,247,867	n/a	1,455,376	1,575,706	1,893,800	52%	1,222,365
South	1,646,200	n/a	1,603,288	1,618,257	1,790,743	9%	1,389,566
All	3,281,650	n/a	3,536,643	3,672,608	4,186,266	28%	2,957,683

Source: Logistic unit reports, MoAFS data

Table 4 shows high and highly variable rates of growth in the number of farm families across regions and across years and a wide discrepancy between 2007/8 to 2009/10 MoAFS numbers and NSO 2008 census numbers. Over the years MoAFS farm families' numbers have increased by widely differing rates across the three regions (29%, 52% and 9% in the north, centre and south respectively). Within each region there are widely differing rates of increase between years: there was an increase of 23% in the north from 2005/6 to 2007/8, with increases of 0 and 5% in the two subsequent years; in the centre an increase of 17% from 2005/6 to 2007/8 was followed by subsequent annual increases of 8 and 20%; in the south there was a fall of 3% in reported farm families from 2005/6 to 2007/8 with increases of 4 and 14% in subsequent years. These variable and on average high rates of growth contrast with a national intercensal annual household growth rate of 2.5% (3.6, 3.1, and 2.1% in the north, centre and south respectively) calculated from NSO (2008).

Two explanations for the very high growth and variable rates in MoAFS farm family estimates are reported anecdotally: the splitting of households when registering and the creation of 'ghost villages' and 'ghost farm families' in the registration process. Some combination of these two explanations is likely, together with the correction of omissions or over-counting from year to year and the possibility of some under-counting in the census. Increased numbers of 'split' and 'ghost' farm families and variation in these increases across regions and across years are also compatible with the patterns observed in total and per farm family coupon redemptions (as shown in figure 4 and discussed above), with comparisons between NSO and MoAFS estimates of household and farm family numbers, with analysis of coupon receipts and fertiliser purchases (see Dorward et al, 2010b) and with widely held perceptions that the number of coupons has been declining over time (reported in the 2009 household survey – see Dorward et al, 2010b, and in FUM 2009/10 monitoring reports).

Considerable attention has been given to these issues here as they have two important implications for beneficiary access to subsidised inputs.

- First, over the life of the programme there has been a clear shift in the proportion of coupons from the central and northern regions to the southern region. This has led to a more even distribution of coupons per farm family across the regions (although if household numbers are more inflated in the centre and north than in the south, as seems likely, coupons per farm family may still be higher in the north and centre than in the south). Given the higher incidence of poverty in the southern region, the relative increase in coupon redemptions in the south should lead to more coupons going to poorer people. This should not only improve targeting to poorer people, it should also reduce displacement of unsubsidised purchases by subsidised purchases.

- Second, opposing this improvement in targeting from the relative shift in coupons to the southern region, however, are detrimental effects from increases in real, 'split' and 'ghost' farm families. Increases in real and 'ghost' numbers mean that there are fewer coupons available per farm family, whether poor or less poor. Increases in 'split' farm families might be expected to discriminate against smaller, poorer households or those with larger proportions of children (for example female, child headed households or those with more children).

As noted earlier, beneficiary access to subsidised inputs is not only determined by the availability and allocation of coupons, it is also determined by the availability of inputs for redemption, by costs incurred in redemption, and by the ability of different households to afford those costs. There is no systematic information on these issues for the 2009/10 seasons, only information from FUM / MEJN reports from monitoring of targeting, coupon redemption and input access at selected markets in selected districts and from stakeholder consultations. These reports provide largely anecdotal information as there is no consistent reporting of issues across different markets and districts over time (indeed reports for different weeks contain the same information for some districts) and no formal sampling of respondents. It is also difficult to judge the reliability or general applicability of sometimes contradictory information gained from different respondents. Although it is likely that the issues raised are real, their extent and severity is difficult to judge. Indeed a major conclusion that can be drawn from these reports is that there is significant variation in procedures, successes and problems across different districts and indeed across different markets within districts.

With regard to coupon distribution, there were repeated reports of instances where farmers complained about the very limited numbers of coupons issued relative to numbers of farmers registered and of cases where farmers believed that they had been registered for receipt of coupons but did not receive them. Such reports were generally associated with complaints about lack of transparency and rumours of agricultural staff and/or headmen diverting coupons. However, one of the reports also concludes that farmers are generally satisfied with the distribution, and there are also instances of good practice in coupon distribution with committees involving a wide range of stakeholders, including women, in transparent coupon allocation.

Reports of periodic and sometimes long standing 'stock outs' of fertilisers were common among substantial numbers of sampled markets. Where 'stock outs' occurred they led to substantial difficulties for farmers trying to redeem coupons. These involved time spent away from their farming, sometimes sleeping outside markets for more than one night, with costs for transport and subsistence, and particular difficulties and risks for women and for their children, and for the elderly and infirm. Queues also encouraged the requirements for 'tips' to get to the front of the queue and/or to redeem coupons. Farmers also needed to travel long distances to reach markets which were reported to have inputs in stock – but could then be disappointed to find them out of stock. Some markets also operated sales systems that appeared to require farmers' attendance over longer periods (for example separating the paper work from the issue of inputs) and/or had insufficient staff to deal with the demand. Almost all of these reports concerned fertiliser sales from ADMARC and SFFRFM markets, but there was one report of difficulties with seed purchases from a private company.

However, there were also substantial reports of markets where no 'tips' were required, and of markets which were well organised in ways that reduced these problems, through better coordination of and information on stock availability for farmers, through better management of sales procedures, and through the establishment of special queues for more vulnerable beneficiaries (for example pregnant women, women with children, the elderly, the sick and infirm).

There are mixed reports on the use of Voter Identification cards in the process of beneficiary identification and coupon redemption. Some reported that it was helpful in reducing diversion of coupons to traders from neighbouring countries (FUM, 2009) while others were concerned that it discriminated against those that did not vote in the 2009 elections - for a variety of valid reasons (FUM/MEJN 2010) and that it was not 100% effective in preventing fraud as approximately 1% of beneficiaries registered had missing or duplicate voter identification numbers and it placed an extra administrative burden during registration (Logistics Unit Final Report, 2009). While it is difficult to determine what are the relative benefits and costs of implementing these kinds of checks, it would seem clear that if they are to be implemented then a national identity card system would be needed to overcome problems with voter identification discussed above, with systems to ensure that they are regularly kept up to date (with removal of cards after deaths and new issues for new adults), that systems are universally followed with minimum administrative load, and that they also take account of difficulties of intra-household relations and the relative rights of men and women to access coupons and redeem inputs.

2.5 Programme costs

The Logistics Unit Final Report presents a breakdown of 'known' financial costs for the 2009/10 programme, and also lists a set of unknown costs. Table 5 below sets out estimated and known costs. Costs have been included for fertiliser carried forward in stock but not included in the buyback scheme, valued at the average for tender deliveries. Losses on the buyback are excluded. This means that the high purchase costs of fertiliser carried forward due to high prices in 2008 have not been assigned to 2009/10 programme costs.

Table 5 Estimated programme costs

Item	MK Million	Source / Notes
Costs		
Seeds - legumes	399.96	Logistics Unit report
Seeds – maize	2,421.11	Logistics Unit report
Fertiliser - "Buy back" from 2008/9	4,970.00	Logistics Unit report
Fertiliser - brought forward no 'buyback'	3,372.76	Estimate: priced at average for tender deliveries
Fertiliser - new supplies	8,080.08	Logistics Unit report
Transport Costs	894.27	Logistics Unit report
Logistics Unit operational costs	30.38	Logistics Unit report
ADMARC operational costs	195.00	Logistics Unit report
SFFRFM operational costs	150.00	Logistics Unit report
MoAFS operating costs	1,100.00	Estimate: Dorward et al (2010a) for 2008/9
Coupon printing	20.00	Estimate: Dorward et al (2010a) for 2008/9
Other agencies	32.00	Estimate: Dorward et al (2010a) for 2008/9
Bank charges on buy back	248.50	Estimate: 5% on buyback value
Total estimated costs	21,914.05	
Less: Farmer redemption due	1,614.95	Estimate from redemptions & value
<i>Total Net costs</i>	<i>20,299.10</i>	
Funding		
Direct Donor Support	2,470.39	Pledged funds (LU report), May exchange rates
Government of Malawi (balance)	17,828.71	Balance, net of farmer redemption
<i>Total</i>	<i>20,299.10</i>	
Other donor support (TA, reporting)	37.59	Pledged funds (LU report), May exchange rates

Sources: Own calculations from sources listed in table

The budget for the 2009/10 programme was Million MK19,400. However not all the costs included in table 4 should be set against that budget – notably the fertiliser carried forward without any buyback will have been included in the previous year's budget. Exclusion of this would give government expenditure of Million MK 16,071 before deduction of farmers' redemption and Million MK 14,456 net of redemption, well within budget. As table 2 shows, 2009/10 costs have fallen back dramatically from 2008/9 programme costs as a result of tight control of a lower budgeted quantity of subsidised fertiliser and much lower prices for fertilisers.

3 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.

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 it difficult to estimate changes in input use that would have happened anyway, and there are no survey data which would allow econometric estimation of changes in farmers' demand for unsubsidised inputs. However, econometric estimation from 2006/7 and 2008/9 survey data gave relatively low estimates of displacement of unsubsidised purchases by subsidised purchases (23% and 3% respectively, Ricker-Gilbert and Jayne, 2010) and consequently high rates of incremental fertiliser use as a result of the subsidy programme, but these figures do not allow for diversion with some subsidised fertiliser consequently mis-classified as unsubsidised. While 2008/9 displacement was probably reduced as a result of the high prices of unsubsidised fertilisers that year (prices which have since fallen), displacement was higher for 'tobacco fertilisers' than for 'maize fertilisers', and the 2009/10 programme excluded 'tobacco fertilisers'.

Table 6 sets out the estimated incremental maize production as a result of subsidised fertilisers and maize seeds, together with estimates of the economic and financial returns from increased maize production as a result of the programme. The fiscal costs of the programme are adjusted to exclude the costs of displaced fertiliser, further on-farm economic costs are added, and downward adjustments are made to non-tradable costs using a shadow exchange rate to represent the effects of the widely reported over-valuation of the exchange rate (see for example Lea and Hanmer, 2009).

Total benefits from the programme are determined by the value of incremental production, which is affected by maize prices, technical returns to on farm input use, and displacement rates. A displacement rate of 15% is used, taking account of the issues raised above, and similar yield response rates to those used in the 2006/7 and 2008/9 analyses. Maize is valued at \$260/MT using an average of 'without subsidy' import parity price of \$300/MT and

a 'with subsidy' domestic price of \$220 /MT (equivalent to MK33/kg at an exchange rate of 150MK/\$US). The analysis considers only benefits from incremental maize production from subsidised fertilisers and maize seed: costs and benefits of subsidised legume seed are excluded as necessary information is not available on the impact of the subsidised legume seed on legume areas and production.

Table 6 Estimated programme costs and benefits

	Units	Price (OER)	No units	Cost	
				OER, no displacement	SER, displacement
Shadow exchange rate	MK/US\$			141.31	170.00
Fertiliser displacement	%			0%	15%
Incremental fertiliser used	MT			159,585	135,647
Government costs					
Incremental fert. (supply & transport)	US\$	774		123,523,629	104,995,085
Hybrid seed	US\$	2,123	7,619	16,175,385	14,684,526
OPV seed	US\$	1,062	1,033	1,096,546	995,479
Legume seed	US\$			0	0
Other seed	US\$			0	0
Program implementation	US\$			10,808,890	9,812,652
Total Gross Cost	US\$			151,604,451	130,487,742
Less fertiliser redemption by farmers	US\$	71		11,293,472	7,979,250
<i>Total Net Cost</i>	US\$			140,310,979	122,508,492
Farmer costs					
Cost of fertiliser	US\$			11,293,472	7,979,250
Local transport etc in purchasing inputs	US\$			11,144,607	9,263,614
Fertiliser application labour	US\$			5,646,736	3,989,625
Harvest labour	US\$			41,209,394	29,822,794
Extra cost for displaced fertiliser	US\$			0	15,018,258
<i>Total farmer costs</i>	US\$			69,294,209	66,073,541
Total Government & Farmer Costs	US\$			209,605,188	188,582,033
Benefits					
Incremental maize production	MT				811,180
Value Incremental maize production	US\$/MT	260			210,906,799
Benefit cost ratio					1.118
Net Present value	US\$ million				22.32
Fiscal efficiency	%				15.9%

Notes : Fiscal costs are programme costs with official exchange rate (OER) and no displacement. Costs of non-maize seeds and grain storage chemicals excluded.

50% of programme implementation costs and of seed costs are taken to be non-tradable so the mean of official exchange rate and shadow exchange rate (SER) is applied.

Farmer labour and transport costs from 2 million recipients, with 2 days/hh accessing inputs, MK300/hh transport and other costs, 25 days labour/MT harvested etc, 1 days application of fertiliser per bag, 250MK/day wage.

Extra costs of displaced fertiliser are 50% of its transport etc costs and 10% loss in its yield due to later application.

Sources: Own calculations, costings from information in Logistics Unit 2009 Final report

Total incremental production of maize is estimated at just over 770,000 MT and the estimated benefit cost ratio is 1.118 with an NPV of US\$ 22.32 million and fiscal efficiency (NPV/fiscal costs) of 15.9%. These results are sensitive to maize prices and as argued in earlier reports, although high domestic maize prices may raise the calculated benefit cost ratio from the programme, this ignores the costs to poor consumers of high prices, and high domestic prices depress real growth, poverty reduction and household food security. Comparison of economic rates of return across different programmes also ignore the time over which returns are achieved, and the rapid return within less than a year is an important feature of the subsidy programme. A third way that these calculations under-estimate programme benefits is that they fail to account for the very severe long term effects of famine which lead to very high costs of not implementing the programme if the subsidies raise production sufficiently in bad years to prevent (a) poor food insecure households from implementing 'coping' or response strategies with very high long term costs (such as distress sales of assets at low prices, removal of children from school) and (b) long term effects of child malnutrition on their physical and cognitive development, with severe damage to well being and productivity. Economic cost benefit analysis does not therefore provide particularly good measures of programme benefits, efficiency or effectiveness in terms of its promotion of food security and growth. Estimated returns are also sensitive to the shadow exchange rate (a higher SER leads to higher returns) and to yield responses. Fiscal efficiency and NPV are sensitive to displacement rates.

Table 7 presents estimates of economic returns over the five years of the programme, using similar assumptions to those above unless otherwise stated.

Table 7 Estimated economic returns 2005/6 to 2009/10

	2005/6	2006/7	2007/8	2008/9	2009/10
Maize price in BC & fiscal efficiency analysis (US\$/mt)	143	154	250	280	260
Fertiliser price in analysis (US\$/mt)	393	490	590	1,250	774
Benefit cost ratio: high response	1.38	1.30	1.90	1.08	1.34
Benefit cost ratio: moderate	1.12	1.06	1.54	0.90	1.12
Benefit cost ratio: low response	0.86	0.81	1.18	0.72	0.90
Fiscal efficiency: high response	0.76	0.44	1.13	0.09	0.46
Fiscal efficiency: moderate	0.24	0.09	0.68	negative	0.16
Fiscal efficiency: low response	negative	negative	0.23	negative	negative
	2005	2006	2007	2008	2009
Poverty incidence	50%	45%	40%	40%	39%
Meals per day	2.0	2.2	2.3	2.3	n/a

Sources: Own calculations; 2006/7 (SOAS et al), and 2008/9 (Dorward et al) evaluation reports, NSO Welfare Monitoring Survey (WMS) reports.

Table 8 presents an estimate of the economic returns of the fertiliser subsidy by itself from the incremental returns achieved by adding the maize seed subsidy, using the moderate response assumptions in table 7. Incremental returns estimated for the maize seed subsidy are high, and the low returns estimated for the programme in the absence of seed show the importance of improved seeds in raising returns to fertiliser. However, it should be noted that these high returns to seed are only obtained in association with the fertiliser subsidy, and they cannot be extrapolated to justify much higher volumes of subsidised seed as this would lead to displacement effects and/or too much fertiliser would be applied per kg of seed (though aggregate seed use could still increase substantially before this would appear likely).

Table 8 Economic returns from fertiliser and incremental maize seed subsidy

		Only Fertilisers	Incremental seed	Total Programme
Incremental production	MT	599,390	211,790	811,180
Incremental value	US\$	155,841,333	55,065,466	210,906,799
Fiscal cost	US\$	106,828,487	15,680,005	122,508,492
Farmer cost	US\$	58,248,749	7,786,406	66,035,155
Total Economic cost	US\$	165,077,236	23,466,411	188,543,647
BCR		0.944	2.37	1.119
FE		negative	1.80	0.159
NPV	US\$	-9,235,903	31,599,055	22,363,152

In view of the programme's objectives to improve national food self sufficiency, a fiscal argument is often put forward to justify the programme – that the cost of the programme is less than the cost to the government of importing maize in the absence of the programme. We analyse this by comparing the fiscal costs of the programme with fiscal savings on government importation and subsidisation of white maize from South Africa as a result of incremental maize production from the programme. This analysis is sensitive to assumptions about the maize imports saved by the programme in normal years, the frequency of bad years, incremental production in bad years (which might be affected by poor rainfall), and by the costs of subsidising maize imports in the absence of the programme. Table 9 sets out how much the programme has to reduce imports in an average year in order to break-even fiscally for different frequencies of bad years and different assumptions as regards the savings in imports in a bad year. It appears that savings in fiscal costs of food supplies and subsidies across normal and bad years do not on their own justify the fiscal costs of the programme, but they may nevertheless significantly reduce these costs (depending on assumptions regarding the costs of food subsidies in normal years, the frequency of bad years, and the programme's incremental production in bad years – dependent upon the extent and nature of both subsidised seed use and poor rainfall).

Table 9 Breakeven fiscal savings in imports in average years by frequency of bad years and incremental production in bad years

		incremental programme production in bad year as % normal		
		125%	100%	75%
average interval between bad seasons (years)	4	230,000	460,000	687,000
	5	428,000	600,000	773,000

Notes: Based on an import parity price of US \$300 /MT for official imports from South Africa (based on SAFEX futures prices for white maize and \$100/MT international transport) and internal transport and administration costs of further \$100/MT for food / subsidy distribution, a 100% subsidy (ie free distribution) of maize in bad years and a maize price ceiling of 40MK/kg in normal years.

Costings and normal year incremental production etc as in table 6.

Incremental programme production greater than 100% may occur if short season hybrid varieties promoted by the programme are much less affected by poor rainfall than longer season local varieties.

The reduced fiscal and foreign exchange costs associated with the 2009/10 programme as compared with the 2008/9 and even 2007/8 programmes should have reduced the negative macro-economic impacts of the programme while its positive effects will have only diminished a little as regards incremental production.

As regards impacts on private sector input suppliers, although the private sector were responsible for a large share of new tender deliveries (90%), the significant buyback and carry forward quantities from the previous year meant that the volume of their tender deliveries as relatively small (just under 69,000MT as compared with nearly 100,000 and over 160,000 MT in the previous two years, see table 10). Private retailers were not involved in the sale of subsidised fertilisers due to disagreement over the terms for participation. Small agrodealers and other private retailers should have benefited from involvement in increased subsidised seed sales.

Table 10 Private sector involvement in subsidised input sales

	2005/6	2006/7	2007/8	2008/9	2009/10
Private sector fertiliser subsidy tender deliveries (mt)	70,000	99,386	97,845	162,840	68,844
Private sector fertiliser subsidy tender deliveries (%)	48%	72%	71%	88%	90%
Fertiliser retail by private sector (%)	0%	28%	24%	0%	0%

4 Conclusions and recommendations

In many ways the implementation of the 2009/10 subsidy programme demonstrates many important improvements and achievements as compared with implementation in previous years. These include:

- More timely deliveries and sales of inputs
- Control of physical budget overruns on subsidised fertiliser sales
- Under expenditure on the financial budget - although some of this was the result of large carry over stocks as a result of budget over runs in 2008/9
- More timely processing of fertiliser supplier payments
- Greater and more timely return of input coupons by ADMARC and SFFRFM

The programme has also benefited from the decision to exclude subsidies for cash crops inputs.

As a result of these improvements (most of which have been discussed for some time and are in line with recommendations from earlier evaluations – for example SOAS et al 2008, Dorward et al, 2009 – and Logistics Units and other reports) and of the reduced international fertiliser prices, the estimated efficiency and economic returns of the programme have improved.

There are however areas where further improvements could be made:

1. Late coupon allocations and printing delayed the opening of the programme and sales to the end of October, leading to significant stock outs and causing significant problems for farmers, unit markets and transporters
2. Discrepancies between NSO and MoAFS estimates of farm families and the large and varied increases in MoAFS registered farm families over the last few years are associated with concerns about diversion of coupons and lack of transparency in coupon allocations: better information on farm family numbers and more transparent processes could improve coupon allocation procedures, building on previous successful innovations in coupon allocation processes
3. Significant variability in the quality of coupon allocation, distribution and redemption processes presents opportunities for examples of good practice to be shared across areas
4. Participation of private sector retailers in sales of subsidised fertiliser could relieve pressures on markets (as discussed under (1) above) and provide farmers with opportunities to source inputs from a greater variety of markets, increasing their choice and hence ability to get better and more reliable services.
5. Monitoring procedures could be improved with the use of standardised forms and training to ensure that monitors collect more consistent, comparable and reliable information that can be more systematically collated.

A number of these issues are being addressed in the 2010/11 programme implementation.

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