EVALUATION OF THE 2011/12 FARM INPUT SUBSIDY PROGRAMME, MALAWI

Report on Programme Implementation and Benefit Cost Analysis

June 2012

Andrew Dorward and Ephraim Chirwa

Executive Summary

This report presents a brief review of 2011/12 FISP implementation and of estimated economic returns to investments in the programme, based on information from Logistics Unit implementation reports and various secondary sources.

Findings

- Implementation of the subsidy programme is a large, complex and challenging operation. In 2011/12 there were particular challenges with timely fertiliser procurement and distribution as a result of foreign exchange difficulties and fuel shortages, difficulties which also affected the availability and prices of unsubsidised fertiliser, placing increased demand pressures on subsidy supplies and disbursement. Implementation of the programme in this context was a substantial achievement.
- The volume of vouchers and inputs and the number of beneficiaries was reduced by 12.5% from the previous year, leading to some reduction in the volume of inputs procured, distributed and sold, but there no reduction in the scope of the programme as regards the number of areas and communities served.
- Planning and tendering for fertiliser importation and procurement for fertilisers was initiated earlier than in previous years but tender awards were not announced until the end of July 2011 (a little later than the previous year). The awards were, however, affected by a devaluation of the Kwacha very shortly after the tender award, rising international prices for urea, and supplier difficulties in obtaining forex. The government agreed to a 10% increase in Malawi Kwacha prices, with an 8% increase in urea prices to cover rising international prices. Forex and other difficulties led some suppliers to withdraw later, with their supplies being covered by others, and DFID and the Norwegian Government provided some direct support to the costs of fertiliser procurement.
- The percentage of imports by the private sector declined a little from 2010/11 to 79%, with a large decline in absolute private sector volumes.
- Analysis of procurement prices shows a fairly narrow and even spread. Comparison of historical procurement and international prices shows very high volatility in fertiliser prices and the exposure of suppliers to large foreign exchange risks and potential losses and gains.
- As in 2010/11, there were storage problems in SFFRFM depots that slowed early deliveries. Later deliveries were constrained by foreign exchange problems. Deliveries were not completed until early February. Despite procurement difficulties depot deliveries were more timely as a percentage of sales than in 2006/7 to 2008/9 but were still not as timely as required for early farmers purchases
- Uplifts from depots to markets suffered a reverse from previous years' steady improvements in timing. Distribution of vouchers was completed a little earlier than in previous years but still not early enough. Consequent late starting to sales compounded the pressure on transport and hence the effects of the diesel shortage (where bureaucratic difficulties reduced the benefit of special funding arrangements for fuel prioritisation).
- As in previous years there were significant delays in payments of invoices for fertiliser and seed supplies, as well as very substantial unpaid invoices from seed suppliers from the 2010/11 season.

- Registers of farm households in all districts were updated in the field from May to September with a fall in registered farm households of just over 2% as compared with 2010. Beneficiary identification was completed by all districts by 20th October, considerably earlier than in previous years but still not early enough.
- Coupon printing was conducted in the UK with much improved security features and tighter distribution systems.
- There were anecdotal reports of substantial delays and widespread demands by market staff for illegal 'top up' payments for redemption, but without a household survey these could not be verified
- Fertiliser sales from stock records of 139,900 MT, were just about on budget. Maize seed sales (1,39 million packs, 8,244 MT, made up of 5,643 MT of hybrid seed and 2,602 MT of OPV seed) were very slightly under budget, legume seed sales (1.3 million packs, 2,602 MT, of which 1,579 was groundnut seed) more so, but considerably improved on previous years prior to 2010/11.
- Improved voucher security features appear to have substantially reduced the number of counterfeit vouchers submitted. Fake fertiliser vouchers not identified at sales outlets but identified by the Logistics Unit represent just over 1% of total fertiliser redemptions, with six districts accounting for 95% of these. Rates of fake vouchers in maize seed redemptions (7%) continued to be higher than for other vouchers, but were much lower than in 2010/11.
- The budget for the subsidy programme in the 2011/12 national budget was MK21 billion (a little under US$140 million). This budgetary provision represented 55%% of the MoAIWD budget allocation and 6.9% of the national budget.
- Estimated expenditure on the FISP before farmer repayments on fertiliser purchases in 2011/12 was MK24.9 billion (US$149.1 million), including donor funded activities. These costs are similar to 2010/11 costs as the reduction in fertiliser volumes was counterbalanced by more expensive fertilisers as a result of the devaluation of Malawi Kwacha as well as higher international prices.
- Direct donor contributions increased in 2011/12 to 32% of the estimated total costs after deduction of farmer repayments as a result of significant direct funding of fertiliser procurement by DFID and the Norwegian Government in addition to continued support to seed procurement.
- Estimated benefit cost ratios (BCRs) are sensitive to incremental yields and prices, while net present value (NPV) and fiscal efficiency (FE) estimates are also sensitive to the extent of displacement of unsubsidised by subsidised input sales. Using different price and yield scenarios, estimated benefit cost ratios range from 1.1 to 1.7 without any allowance for multipliers from growth linkages, and from 1.2 to 1.9 with allowance for growth multipliers, with the most likely estimates roughly in the middle of these ranges.

The analysis suggests a number of options for improving the implementation of the programme, including:

- Measures that allow shorter bid validity periods and faster tender processing and awards and more rapid payments of invoices should lead to lower tender prices. They would also allow for earlier delivery of supplies.
- Shortage of depot space, the result of limited storage within SFFRFM and of slow uplifts from depots to markets. , could be addressed by making greater use of retail sales by private retailers.

- Earlier beneficiary identification, voucher distribution and opening of the programme markets could also ease these depot space shortages and transport constraints, reduce pressures on markets, reduce the time that farmers spend queuing (with attendant demands and pressures for the evils of additional payment of 'tips' for redemption) and allow earlier planting and fertiliser application, which usually leads to higher yields (though this was not the case in some areas in 2011/12).
- The measures taken to improve voucher security are strongly endorsed but there is need for more robust systems enforcing controls at markets.
- Action to ensure greater availability of legumes preferred by farmers.
- There is scope for substantial increases in returns to the programme from measures that will raise incremental yields (such as earlier programme implementation as outlined above) and reduce costs. It is also important to prevent capture of subsidised inputs, or of benefits from access to them, by corrupt and criminal activity in the supply chain.

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1. Introduction

This paper, part of a set of papers addressing issues in a 'light touch' evaluation of different aspects of the 2011/12farm input subsidy, reviews the processes of subsidy implementation and early estimates of benefits and costs from the programme. It describes first the procedures and achievements in procuring and selling subsidised inputs, and presents a preliminary benefit cost analysis of the programme. A strong emphasis is placed on comparing achievements in the 2011/12 season with previous seasons, noting challenges and successes.

Implementation of the subsidy programme is a large, complex and challenging operation. In 2011/12 there were particular challenges as a result of foreign exchange difficulties (posing particular difficulties with timely fertiliser procurement) and of fuel shortages (posing particular difficulties for timely fertiliser distribution and for supervisory field visits). These difficulties also affected the availability and prices of unsubsidised fertilisers, placing increased demand pressures on subsidy supplies and disbursement. Although the volume of vouchers and inputs and the number of beneficiaries was reduced by 12.5% from the previous year and this led to some reduction in the volume of inputs procured, distributed and sold, there was no reduction in the scope of the programme as regards the number of areas and communities served. Indeed the difficulties in procurement and transport resulting from forex and fuel shortages significantly added to the operational challenges.

Information on implementation achievements is obtained largely from the implementation reports (predominantly the Logistics Units weekly reports and its annual report). Reference is also made to FUM monitoring reports at sentinel sites. Various secondary sources are also used, on national and international prices for example.

It has not been possible to obtain information on disbursement or costs of subsidised grain storage chemicals, and these are not considered in this report. We do not reproduce the detailed information and recommendations provided in the Logistics Unit Report beyond summarising and drawing attention to critical issues, and relating them to information from other sources.

2. Fertiliser procurement

As in the previous three years, fertiliser procurement was entirely the responsibility of government as there were no retail sales of subsidised fertiliser procured by private companies. Planning and tendering for fertiliser importation and procurement for fertilisers was initiated earlier than in previous years, with bid documents issued initially at the end of February for public opening in mid-April. The tender awards were announced in at the end of July 2011 (a little later than the previous year)for purchase of as total of 90,000MT (50,000 tons of urea, 25,000 tons of NPK 23:21:0+4S and 15,000 MTS NPK 23:10:5+6S+1.0Zn). ADMARC and SFFRFM were to supply a further 50,000 tons (30,000 tons NPK and 20,000 tons urea) to make up a total of 140,000 tons. This total represents a reduction of 160,000 from 2010/11, and a continuing decline in the volume of the fertiliser from its peak of 216,000 tons in 2007/8.

Tender awards were, however, affected by a devaluation of the Kwacha very shortly after the tender award, rising international prices for urea, and supplier difficulties in obtaining forex. As a result of the devaluation the government agreed to a 10% increase in Malawi Kwacha prices, with an 8% increase in urea prices to cover rising international prices (although one supplier still withdrew). Forex and other difficulties led to some suppliers (including ADMARC) being unable to meet their commitments,, with their

supplies being covered by others, and DFID and the Norwegian Government providing some direct support to the costs of fertiliser procurement. Figure 1 shows changes in absolute quantities of fertiliser procured by source each year since 2005/6, with the % of total new imports by private companies each year. The percentage of imports made by the private sector increased steadily from 2005/6 to 2010/11 (from 48% to 95%) and then declined a little in 2011/12 (to 79%). There is more variability in absolute quantities imported by the private sector as in some years there were substantial stock carry overs from the previous year (most notably in 2007/8 and 20009/10). Carry forwards were very low in both 2010/11 and 2011/12 (531 and 474 MTS respectively).

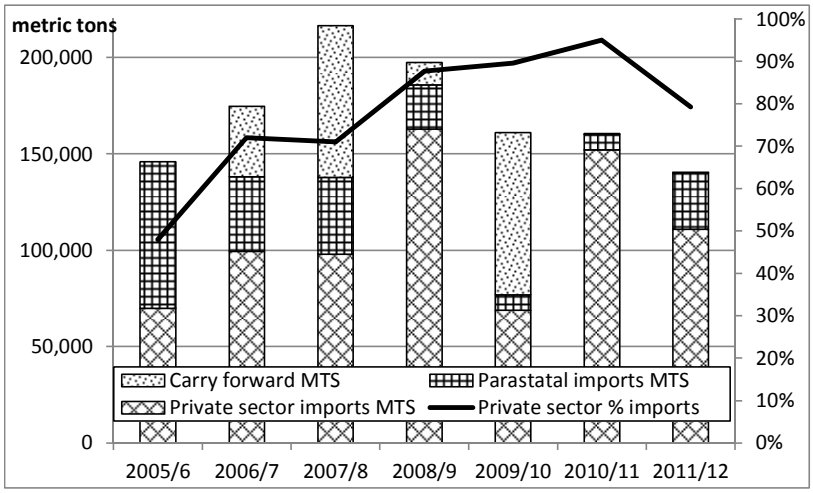


Figure 1 Fertiliser supplies by source, 2005/6 to 2011/12
Sources: Logistics Unit annual reports

Figure 2 shows the award and actual delivered prices for NPK and urea in US$/MT. In all graphs the high outlier prices are for (relatively small) supplies by ADMARC[1]. For NPK the award and delivery prices are unchanged (in US$) but there are some differences in supply (for example the withdrawal of ADMARC supply from Kanengo). The delivery prices are higher than the tender award prices for urea, as described above, with again differences in supply (for example the withdrawal of ADMARC supply from Chirimba). For both fertiliser types, prices are generally lower for delivery to Chirimba, and higher for delivery to Luwinga, as one would expect. Prices are generally fairly evenly spread.

[1] These deliveries by ADMARC as compared with delivery at average tender prices of other suppliers were equivalent to a subvention of MK87 million (US$0.5 million) or 0.5% of total fertiliser procurement costs.

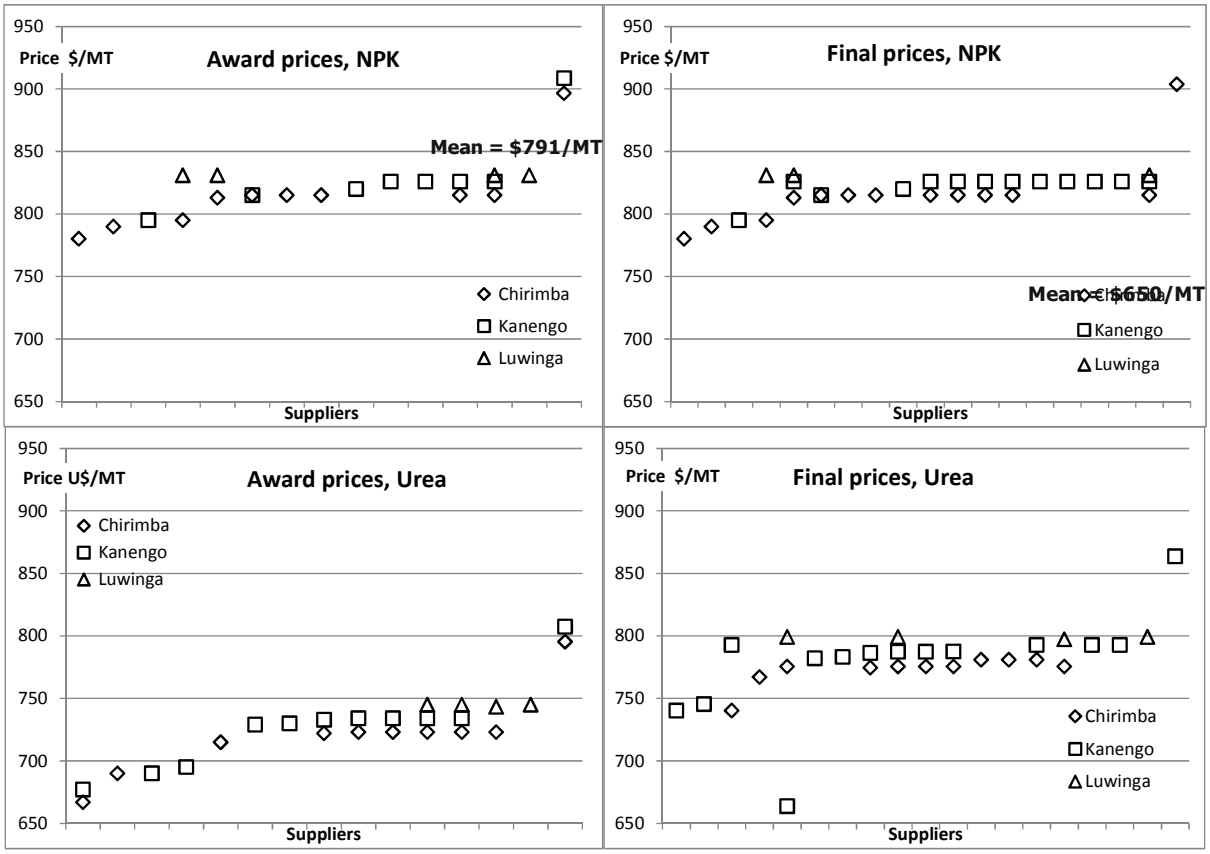


Figure 2 Mean Fertiliser prices by supplier

Source: Logistics Unit, 2012

Figure 3 shows a comparison of average NPK and urea prices in each FISP year from 2006/7 compared against international prices, with good data on procurement prices available for the last three years but weaker data for the previous three years. Data are shown each year from March to November, with March to April generally being the time at which tenders have been submitted (and hence the basis for tender pricing) with delivery from August to December: actual timing of different suppliers' purchases is not known, nor are the prices paid, but the international prices in the figure show broad patterns of change in prices and in difference between delivered and international prices. The rise in urea prices from March to June 2011 is evident, with a peak in September. More generally the figure shows the very high volatility in fertiliser prices in recent years, and, with foreign exchange risks, the exposure of suppliers to large potential losses and gains. As noted in the Logistics Unit annual report, (Logistics Unit, 2012) this exposure must lead to suppliers building substantial risk margins into their tenders, and measures that allow shorter bid validity periods and faster tender processing and awards should allow lower prices. It would also allow for earlier delivery of supplies. As will be discussed later, late delivery of supplies was a major problem late in the season – at the start of the season, as in 2010/11, season storage space was more of a constraint on fertiliser receipt than deliveries.

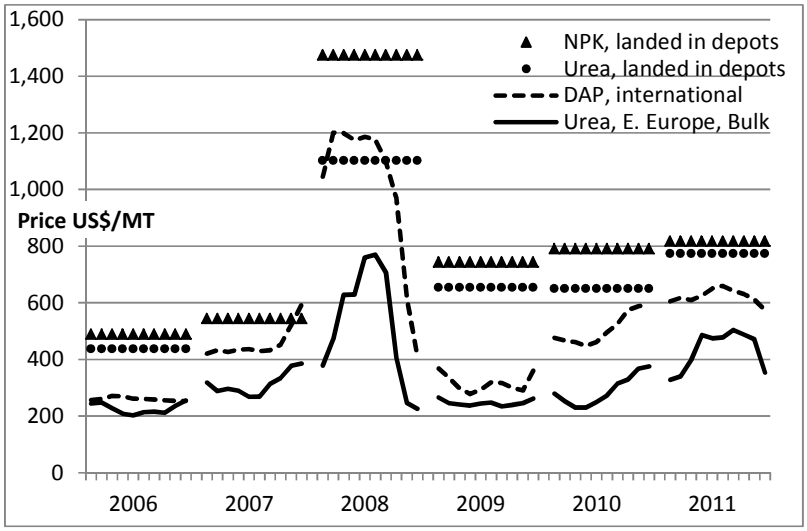


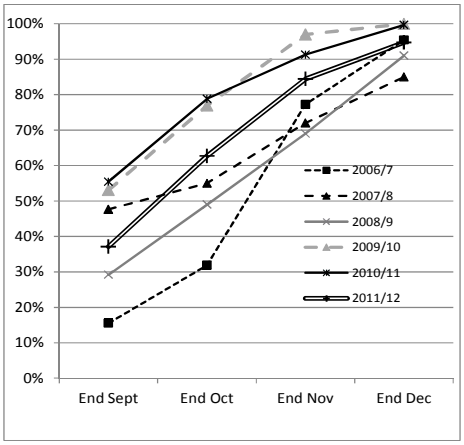
Figure 3 Landed and International Fertiliser Prices, 2006-2011

Sources: Logistics Unit annual reports and data, World Bank commodity price data (World Bank, 2012)

Notes: 2007/8 & 2008/9 information for only part of purchases, 2009/10 excludes ADMARC b/fw Urea at US$1254/MT, 2011/12 excludes ADMARC supplies of Urea at US$864/MT & NPK at US$863/MT

As in 2010/11, prompt delivery of some stocks led to storage problems when SFFRFM depots did not have space to accommodate them (this problem was exacerbated by a shortage of diesel for transporting stocks from warehouses to depots), but stocks ready for delivery were held by suppliers against a 90% payment until space became available. All deliveries should, contractually, have been made by the end of October, but by that date 62% of the tender award had been delivered, with deliveries held up mainly by foreign exchange problems. Deliveries had risen to 84% by the end of November (compared with 91% of larger volumes in 2010/11). Deliveries were not completed until early February. Deliveries were fairly evenly distributed across the three regions relative to total requirements.

Figures 4 and 5 show cumulative deliveries and uplifts of fertiliser over time for each year of the programme, as percentages of total parastatal sales (also see annex table A1).



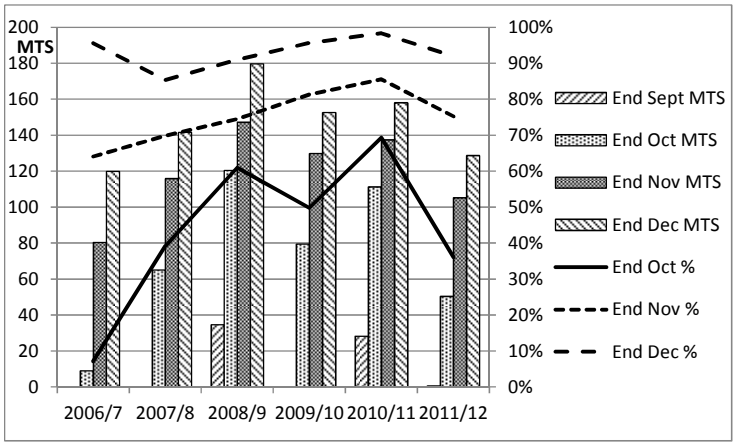


Figure 4 Cumulative depot deliveries (%parastatal sales by end of month)

Figure 5 Uplifts by month (MTS &%parastatal sales by end of month)

Source: Logistics Unit, 2009 and Logistic Unit weekly reports

Figure 4 shows that despite the procurement difficulties described above, as a percentage of sales up to end December the depot deliveries were more timely than in 2006/7 to 2009/9, and as percentage of

imports they were also more timely than 2009/10 (and only 2010/11 was more timely). Given the difficulties in 2011/12 this is commendable. However, in all years deliveries are not as timely as required for early farmers' purchases, and tend to be constrained at the end by late deliveries and at the beginning by shortage of depot space. Shortage of depot space is the result of limited storage within SFFRFM, which could be addressed by making greater use of retail sales by private retailers, and slow uplifts from depots to markets.

Figure 5 shows that uplifts from depots to markets suffered a reverse from previous years' steady improvements in timing (in percentage terms): percentage uplifts by month in 2011/12 were back to 2007/8 levels, while absolute uplift volumes by month were back to 2006/7 levels. In previous years slow uplifts by end October tended to be the result of late distribution of vouchers to beneficiaries, late market opening and transport shortages at peak times. In 2011/12 distribution of vouchers was completed a little earlier than in previous years but still not early enough (see figure 6, which shows how the timing for completion of various critical processes has varied over the last 6 seasons – note that lower plots in the graph signify earlier completion). Consequent late starting to sales compounded the pressure on transport and hence the effects of the diesel shortage.

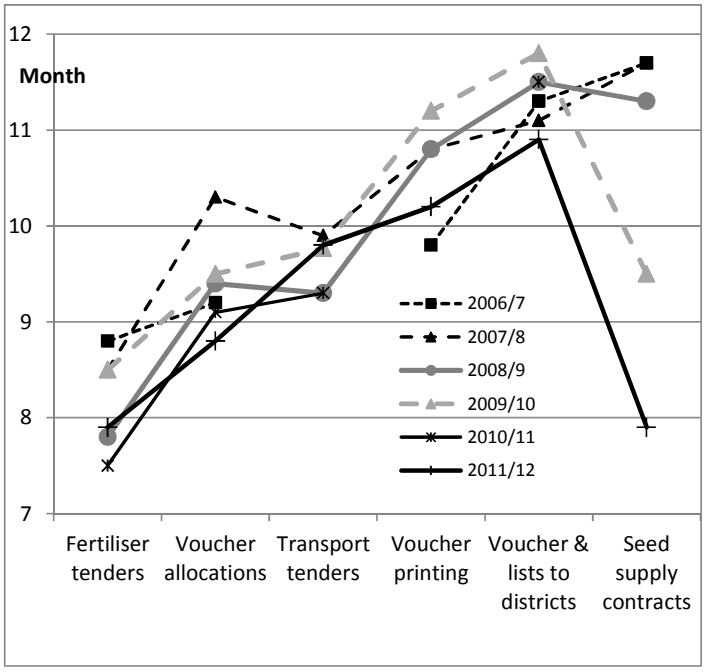


Figure 6 Timing of completion of contracts & voucher processes
Source: Logistics Unit, 2009 and Logistic Unit weekly reports

Logistics Unit (2012) notes the following:

- Delays in award of tenders increase risks of price rises for those tendering, and since such risks will be built into tender prices, they tend to inflate prices. The transfer of exchange rate risk through a fixed exchange rate has the same effect.
- Tender contracts should include penalty clauses for late delivery of contracted amounts.
- Bureaucratic difficulties meant that there was only limited benefit from special funding arrangements for fuel prioritisation for transport for fertiliser uplifts.
- Transit losses of fertilisers were low and fully recovered from transporters.
- Transport costs of approximately MK 40 million were incurred due to imbalances between deliveries to depots / markets and their sales requirements.

Figure 7 shows that as in previous years there were significant delays in payments of invoices for fertiliser and seed supplies, the latter claimed by seed suppliers against voucher submissions after sales to farmers. There were very substantial unpaid invoices from seed suppliers from the 2010/11 season, and significant progress in settling these was not made until April 2012. Such delays are also likely to increase prices in future tenders.

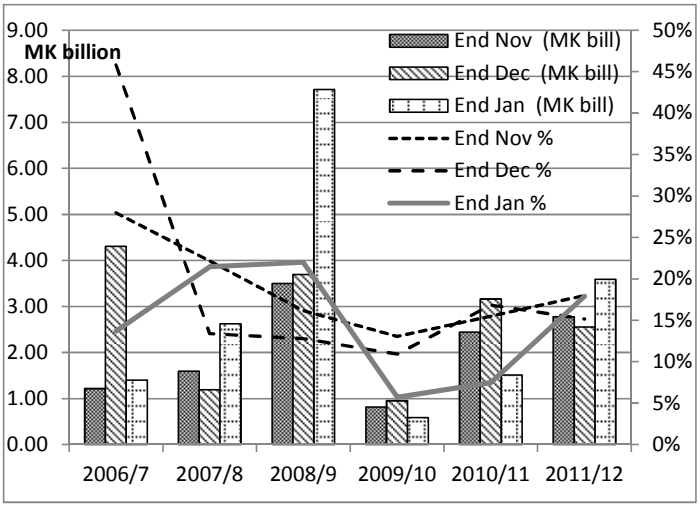


Figure 7 Outstanding invoice payments by season

Source: Logistic Unit weekly reports

3. Seed procurement

Seed companies and government agreed that farmers should be able to buy seed with a seed coupon with a maximum MK100 cash top up from farmers, and that these coupons would be redeemed by government for a price of MK 1,815/coupon and legume seed with coupons to be redeemed by government at a price of MK815 per coupon. Seed companies were responsible for stocking retail outlets (agro-dealers, input supply shops, and ADMARC and SFFRFM markets) with 5kg packets of hybrid seed, 10kg packets of OPV seed and 2 kg packets of legume seed (beans, cowpeas, pigeon peas, groundnuts or soya)for redemption by farmers, with returns by retailers to seed companies who were responsible for claiming reimbursement from the Government (through the Logistics Unit).

4. Coupon printing, allocation and distribution

Coupon allocation involved updating the farm households register, local (village) processes of selection of beneficiaries, allocation of coupons by district and within district by EPA, printing of coupons, distribution to districts, and issue of coupons to beneficiaries. These activities are critical as regards coordination of numbers of beneficiaries identified, coupon printing and issue, and allocation and transport of fertiliser supplies to markets, with total supplies matching fertiliser procurement.

Registers of farm households in all districts were updated in the field from May to September and then cleaned by the Logistics Unit and sent back to districts for checking. This information formed the basis of an initial allocation of coupons at the end of August by district with four coupons per beneficiary to allow each beneficiary to receive a set of subsidised inputs consisting of one hybrid or OPV maize seed pack (5 or 10 kg), one 50 kg bag of NPK, one 50 kg bag of urea, and one 2 kg legume seed pack. District allocations were subdivided by EPA and village using the farm family register in each district, and the EPA and village allocations were distributed to DADOs together with blank registration forms for entry of beneficiary names. This allowed beneficiary identification to start in late August, with beneficiary names, sex and voter registration number, and it was completed by all districts by 20th October, considerably earlier than in previous years. Beneficiary lists were then printed by the Logistics Unit with beneficiary details by village

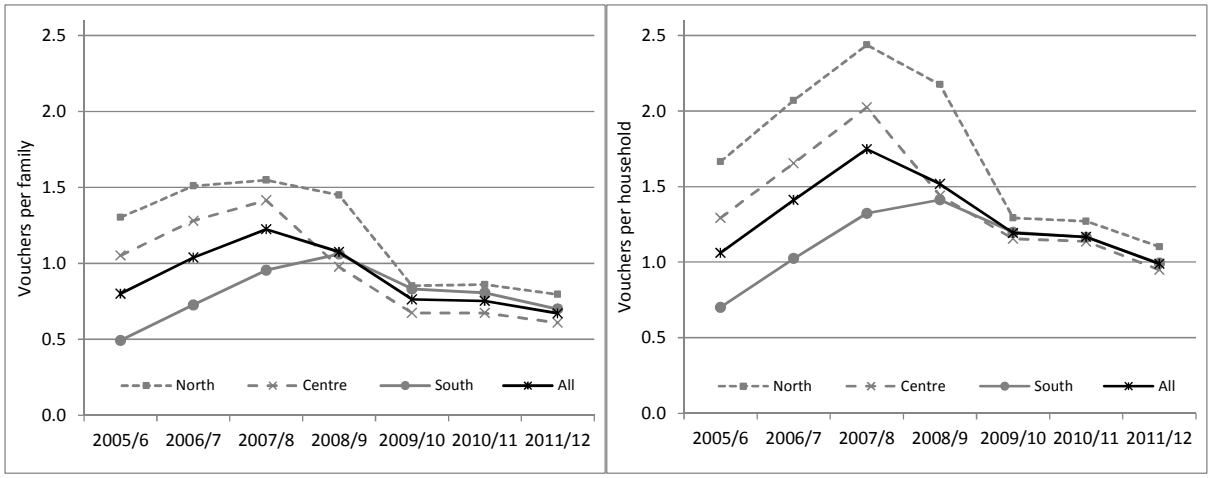
and sent to MoAIWD, and summaries of fertiliser requirements by market compiled. Table 1 shows beneficiary registrations by region (annex table A2 contains the same information by district).

Table 1 Final Beneficiary Registrations by Region (Households)[2]

	Target	% by Region	% Male headed	% Female headed	Unallocated
North	190,773	14%	39%	60%	1%
Centre	563,169	40%	37%	62%	1%
South	645,549	46%	55%	44%	1%
Unallocated	509	0%	na	na	na
Total	1,400,000	100%	46%	53%	1%

Source: Logistics Unit Final Report, 2012

As in previous years there is some unevenness in allocations between districts and regions when compared with estimated population. Figure 8compares changes in fertiliser voucher redemption by region per household over the life of the programme, using MoAIWD farm family and NSO rural household estimates. The data from which these graphs are drawn are given in Annex table A3.



Source: Calculations from Logistics Unit reports, NSO(2008), MVAC livelihood zone data, see Annex table A3.

Figure 8 Estimates of fertiliser voucher redemption per household by region by year using MoAIWD farm family estimates (left) and NSO rural household estimates (right)

Figure 8 shows that the more even allocation per household across regions from 2009/10 has been maintained. The fall in total allocations affected all three regions, and led to a slightly larger fall in estimated allocations per rural household using NSO estimates as compared with allocations per farm family registered with MoAIWD. This is because MoAIWD farm family registrations fell back slightly in 2010 in the northern and central regions, and growth in the southern region fell, so that overall there was fall of just over 2% in 2011 as compared with 2010 (see table A.4). Estimated supply per farm family registered by MoAIWD is much lower than supply per rural household estimated from NSO census figures, for all years after 2005/6 because of very high growth rates in farm family registrations from 2005/6 to 2010/11, particularly in the Central regions, and to a lesser extent in the northern region (see table A4).

Coupon printing was this year conducted in the UK, and it is widely agreed that the security features were much improved in terms of the printing of security features on coupons, some of which were displayed

[2] It should be noted that it may not be clear if the beneficiary listing distinguishes between male and female heads or male and female recipients. In 2010/11 a similar regional pattern was observed, but household survey results showed a reverse pattern, with highest % voucher receipt by female household heads and female recipients within male headed households in the South and lowest in the North.

under UV light (with UV torches distributed to all ADMARC and SFGFRFM selling points. Logistics Unit (2012) however note that some of the security features were not very easy to see for busy sales staff working under pressure: there is no doubt a difficult balance to strike in designing these features. The system for distribution was also much tighter with boxes of coupons packed in the UK according to district allocations and unopened prior to their receipt in districts.

5. Coupon redemption and input sales

Fertiliser coupons were redeemed by beneficiaries at ADMARC or SFFRFM markets with the payment of MK500. Seed coupons could be redeemed at agro-dealers and other input sellers who had made arrangements with seed suppliers for seed coupon redemption, as well as at ADMARC or SFFRFM markets. Legume seed coupons were redeemed without payment, while redemption of maize seed coupons required a MK100 payment for all hybrid varieties and some OPV varieties (all sales of ZM621 supplied by Pantochi required a MK100 payment, no sales of ZM623 required any farmer payment, while all other companies supplying OPV seed removed their initial requirement for farmer payments).Sales occurred when suppliers had stocks and beneficiaries had coupons. There were anecdotal reports of substantial delays and widespread demands by market staff for illegal 'top up' payments for redemption, but without a household survey these could not be verified (previous comparison of reports of such practices in focus group discussions against survey reports suggest that anecdotal reports tend to over-estimate the frequency of thee occurrence, but the apparent increases in anecdotal reports in 2011/12 is nevertheless a matter of significant concern).

Government subsidised seed sales are determined by voucher redemptions, as valid vouchers submitted to the Logistics Unit by seed suppliers are the basis for government payments. For fertilisers the physical supply of fertilisers to ADMARC and SFFRFM markets and there is no requirement for ADMARC or SFFRFM to reimburse the full cost of any sales not matched by vouchers. In the past this led to low and late returns of vouchers by ADMARC in particular, but there have been significant improvements in recent years. Nevertheless discrepancies remain between sales calculated on the basis of physical stocks (deliveries minus closing stocks) and returned vouchers. Reported seed sales from voucher returns and fertiliser sales calculated from stocks are detailed in table 2 with a comparison against allocations[3]. Vouchers returned account for 98% of fertiliser sales estimated from stock reports (97% for ADMARC and 99% for SFFRFM).

Table 2 Subsidised input sales

	Fertilisers (from stock reports, MT)			Seed ('000 packs)	
Region	NPK	Urea	Total	Maize	Legume
North	9,657	9,945	19,602	189.7	169.4
Centre	27,724	28,184	55,907	559.8	532.3
South	32,654	31,737	64,391	639.3	579.0
Total	70,035	69,866	139,900	1,388.8	1,280.8
	Fertilisers (% allocations)			Seed (% allocations)	
Region	NPK	Urea	Total	Maize	Legume
North	101%	104%	103%	98%	87%
Centre	98%	100%	99%	99%	91%
South	101%	98%	100%	98%	88%
Total	100%	100%	100%	98%	89%

Source: Calculations from Logistics Unit (2012)

[3] In previous years (from 2006/7 to 2010/11) fertiliser sales by ADMARC and SFFRFM were monitored and reported on a weekly basis. This was discontinued in 2011/12, and as a result there are no figures on the timing of sales for 2011/12.

With the seed coupons, farmers purchased 5,643 MT of hybrid seed and 2,601.5MT of OPV seed, together with 2561.6MT of legume seed (340.4 MT of beans seed, 0.2 MT of cow peas seed, 1579.1 MT of groundnuts seed, 596.2 MT of soya seed and 45.7 MT of pigeon pea seed). Fertiliser sales were just about on budget (the North slightly over, the Centre slightly under, with small imbalances between NPK and urea). Maize seed sales were very slightly under budget, legume seed sales more so, but considerably improved on previous years when prior to 2010/11 there were acute shortages of legume seed. However volumes sold are lower than in 2010/11 when local shortages meant that many farmers were not able to get their preferred seed type, a situation also reported for 2011/12 (Logistics Unit, 2012). No breakdown is available of types of legume seed by region. Figure 9shows how subsidised fertiliser and seed sales have changed over the life of the programme.

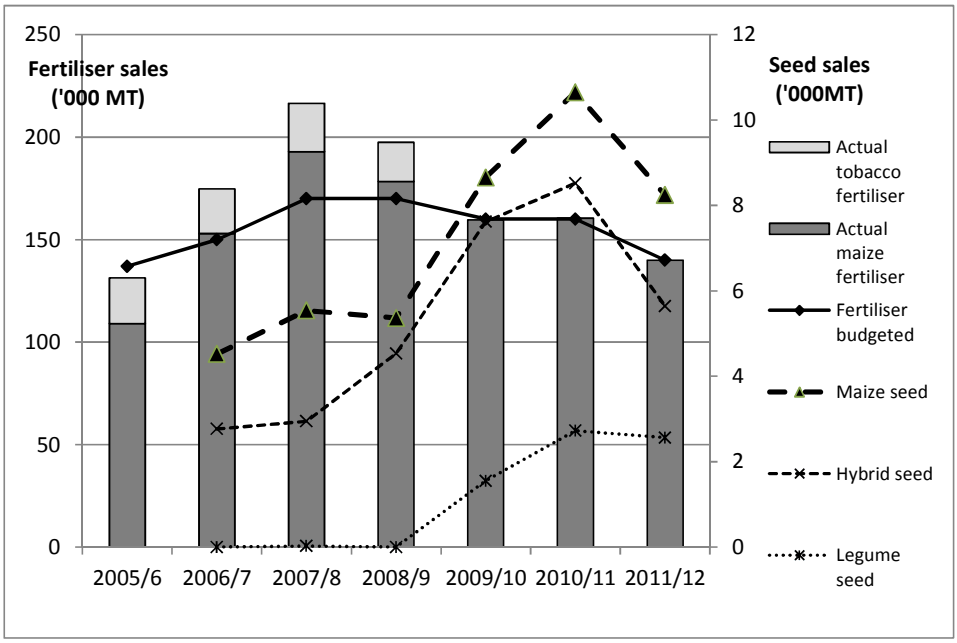


Figure 9 Subsidised fertiliser and seed sales by year
Source: Calculations from Logistics Unit (2011) and earlier reports

As figure 9 shows, fertiliser sales have fallen back almost to 2005/6 levels, although these are now made up entirely of fertilisers for maize. Although seed sales have fallen back from 2010/11 levels (when maize seed sales were substantially inflated by counterfeit vouchers) they are higher than 2005/6 to 2008/9 levels, due largely to the increased maize seed pack sizes. Legume seed sales are very high by historical standards due to both increased targets and improved availability, though local shortages of legume seeds still constrained choice and purchases. Within the maize seed sales there was some continued recovery of market share by OPV as compared to hybrid seed. The reasons for this are not clear as it could be the result of farmer choice of OPV (constrained by availability in previous years) or more constrained availability of preferred hybrid seeds. Analysis of farmer choices in 2010/11 suggested that many farmers who obtained OPV seeds would have preferred hybrid seed but were constrained from buying hybrid seed either by its availability or by its cost (the MK100 payment), and it was not clear which of these was more important. 94% of programme seed sales were through private sector retailers and 6% through ADMARC/SFFRFM.

The improved security features on vouchers in 2011/12 appear to have substantially reduced the number of counterfeit vouchers submitted. The poor security features in 2010/11 made it difficult to clearly identify counterfeit vouchers. This led to substantial over-submission of maize seed vouchers for redemption in all central region districts and in all northern region districts apart from Likoma. Lower rates of over-submission occurred in 8 out of 13 southern region districts. The identification of counterfeit vouchers was

much easier in 2011/12 due to the improved security features. No or very few counterfeit vouchers were redeemed for fertilisers in most districts, exceptions being Zomba, Mangochi, Dedza and Lilongwe where 17,781, 5,5452,606 and 3,230 respectively were identified by the Logistics Unit (1,365and 1,567 were also identified in returns from Machinga and Chiradzulu). These six districts accounted for 95% of fake vouchers identified by the Logistics Unit (there were none from the northern region). Overall, fake fertiliser vouchers not identified at sales outlets but identified by the Logistics Unit represent just over 1% of total fertiliser redemptions, with a higher rate in ADMARC submissions (1.5% as compared with 0% among SFFRFM submissions). Rates of fake vouchers in maize seed redemptions continued to be higher than for other vouchers, with identified fake vouchers comprising 7.0% of all vouchers presented for redemption, again with variation between districts (averages were 12.1% in the central region as compared with 3.6% and 3.3% respectively in the southern and northern regions). There were much fewer fake legume seed vouchers identified, 0.3% overall (0.5% in the central region as compared with 0.2% and 0% respectively in the southern and northern regions).

Table 3 shows the number of maize seeds disbursements and quantities of purchases by variety. As noted earlier, sales of hybrid packs are considerably larger than those of OPV packs, but their smaller size (5kg as compared with 10kg) means that sales volumes of ZM623 are still higher than those of DKC9053.

Table 3 Maize seeds disbursements and quantities of purchases by variety

Variety	Type	MTS	Vouchers
DKC8053	hybrid	1,908.6	381,720
ZM623	OPV	2,156.3	215,629
SC 627	hybrid	971.6	194,329
SC 403	hybrid	957.5	191,496
SC 719	hybrid	850.1	170,011
Pan 53	hybrid	230.3	46,060
Pan 67	hybrid	215.6	43,129
DKC 8031	hybrid	184.6	36,916
ZM 621	hybrid	329.9	32,987
MH 26	hybrid	148.7	29,730
Pan 4M19	hybrid	101.4	20,270
DKC9089	hybrid	31.1	6,217
SC 523	OPV	56.8	5,683
MH 18	hybrid	22.2	4,439
ZM 521	OPV	35.2	3,524
DKC 9088	hybrid	10.4	2,087
ZM 523	OPV	19.3	1,926
SC 717	hybrid	8.1	1,613
MH 27	hybrid	3.0	598
ZM 309	OPV	4.0	403
Total		8,244.6	1,388,767

Source: Logistic Unit (2012)

6. Programme costs

Accurate overall costs of the programme are difficult to estimate due to lack of documented administrative costs borne by the MoAIWD and other organisations involved in the implementation of the subsidy. The available figures therefore reflect the documented costs of the programme; the true costs may be understated by as much as 10 per cent. Calculation of 2011/12 costs are further complicated by changes in exchange rates, as noted earlier. The official exchange rate at the time of tender awards was approximately MK151.5 per US$, and then in early August there was a 10% fall in the official value of the Kwacha with a

rate of MK166.7 per US$. However the parallel unofficial rate was much higher, and in May 2012 there was a devaluation to around MK250 to the US$.

The budget for the subsidy programme in the 2011/12 national budget was MK21 billion (a little under US$140 million at the prevailing official exchange rate). This budgetary provision represented 55% of the MoAIWD budget allocation and 6.9% of the national budget. The FISP Medium Term Plan 2011/12 budget amounted to MK22.8 billion, including provision for grain storage chemicals. The estimated expenditure on the FISP before farmer repayments on fertiliser purchases in 2011/12 is MK24.9 billion (US$149.1 million at an exchange rate of MK166.7 per US$), including donor funded activities. This figure includes an estimate of the cost of implementing the programme by the Ministry of Agriculture and other field agencies. The MoAIWD operational cost estimates take account of the way that most of the operations of the MoAIWD are focused on the implementation of the subsidy programme in the first two to three months of the agricultural season. Although not all MoAIWD activities in this period are concerned with the subsidy programme, the majority are, and there are other costs outside this period, as well as the costs of field agencies involved in coupon allocation and distribution. These estimates, of MK1.13 billion (US$6.8 million), may be considered conservative.

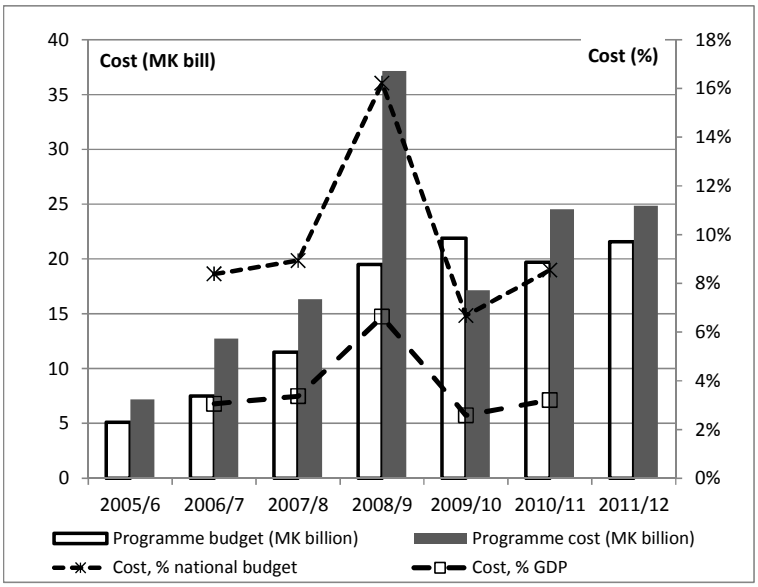


Figure 10 Trends in Agricultural Input Subsidy Costs, 2005/06 – 2011/12

Note: All costs are before any deduction of farmers redemption and exclude estimated costs[4].

Sources: Logistics Units reports; Dorward and Chirwa (2009), Dorward *et al* (2010)

Figure 8 presents the trends in the cost of the agricultural input subsidy since the 2005/06 agricultural season. The graph shows a steady rise in budgeted costs, apart from a fall in 2010/11, while actual costs peaked in 2008/9 due to high fertiliser volumes and very high prices. Costs fell back dramatically in 2009/10 with reduced fertiliser prices and effective control of subsidised volumes, but then rose in 2010/11 (though not to 2008/9 levels) due largely to rising fertiliser prices and increased volumes of subsidised seed. Costs remained roughly constant in 2011/12 due to the reduction in fertiliser volumes being counterbalanced by more expensive fertilisers as a result of the devaluation of Malawi Kwacha as well as higher international prices (see figure 3).

[4] Data in figure 10 are for total subsidy programme expenditure by government and donors, and assume that only a small part of the farmer redemption payments are recovered by the Treasury. We have not been able to obtain consistent information on these issues.

Table 4 shows the cost structure of the 2011/12 subsidy programme, with the first part covering only recorded costs. These amount to MK23.7 million before deduction of farmer repayments. There are a number of unrecorded or unattributed direct costs of the subsidy programme as noted earlier. Lack of clear information on these makes it difficult to properly gauge the total cost of the programme, and where these costs are funded from other budgets then other budgeted activities may suffer. Comparison with the Medium Term Plan budget shows overall expenditures a little under budget after repayment of farmer redemptions.

Table 4 Cost and Financing of the 2010/11FISP

Description	**FISP MTP Budget***	**Expenditure**	
	Malawi Kwacha	Malawi Kwacha	US$
Recorded costs			
Seeds - legumes	1,176,000,000	1,043,891,935	6,261,725
Seeds – maize	2,544,660,689	2,520,584,880	15,119,583
Fertiliser		18,776,276,981	112,628,412
Transport Costs	17,145,370,000	922,778,788	5,535,235
Logistics Unit operational costs		46,680,529	280,010
ADMARC operational costs	380,000,000	262,500,000	1,574,591
SFFRFM operational costs	340,000,000	162,900,000	977,146
Total recorded costs		***23,735,613,113***	**142,376,703**
Less: Farmer redemption due		1,399,010,000	8,391,881
Net recorded Costs	**21,586,030,689**	**22,323,325,603**	**133,905,178**
Estimated other costs*			
Ministry of Agriculture operations	529,370,000	1,100,000,000	6,598,286
Other agencies' field costs		32,000,000	191,950
Total estimated other costs		**1,132,000,000**	**6,790,237**
Total net costs, recorded and estimated	**22,115,400,689**	**23,455,325,603**	**140,695,415**
Funding			
Direct Donor Support		7,477,250,000	44,851,852
Government of Malawi		15,978,075,603	95,843,563

***** Excluding MK 0.7 billion for costs of chemicals for grain storage.

** Actual expenditures for these items are not known. MoAIWD operational costs on the subsidy were estimated in 2008/9 as equivalent to 20% of the recurrent MoAIWD expenditure budget net of subsidy (as MoAIWD operations are largely but not exclusively focused on the subsidy implementation for at least three months in an agricultural season) and this figure has been retained to 2010/11.Estimates of field costs paid to other agencies involved in coupon allocation and distribution have also been carried forward from 2008/9. TA costs excluded. MTP budget costs are financial costs only and exclude MoAIWD staff time

Source of recorded costs: Logistics Unit Final Report 2012

As noted earlier, it has not been possible to obtain information on costs of subsidised grain storage chemicals and these are not included in table 4.

Donors contributed to the 2011/12 FISP directly and through other associated funded activities not included here (for fuel and support to the ACB). The direct support constituted 32% of the estimated total costs after deduction of farmer repayments and covered costs of seeds, the logistic unit operating costs and monitoring and evaluation. Direct support was much larger in 2011/12 than in previous years (for example it amounted to 15% of estimated total net costs in 2010/11) as a result of significant direct funding of fertiliser procurement by DFID and the Norwegian Government in 2011/12 in addition to continued support to seed procurement.

7. Benefit cost analysis

We conclude this paper by estimating benefit cost ratios for the 2011/12 programme. Drawing on Dorward and Chirwa (2011) and to preserve comparability with earlier estimates we present estimates using both a simpler more conventional approach which ignores economy wide benefits from multipliers and linkages from changes in maize prices as a result of the programme[5] . Full details of the methods are found in Dorward and Chirwa (2011).

As reported with previous estimates of returns to FISP, benefit cost ratios (BCRs) are sensitive to incremental yields and prices, while net present value (NPV) and fiscal efficiency (FE) estimates are also sensitive to the extent of displacement of unsubsidised by subsidised input sales. Displacement rates for fertilisers are particularly important and can be estimated with household survey data. These are not available for the 2011/12 and we use a rate of 20% as a likely figure derived from past estimates (in 2006/7 and 2010/11, with very low displacement in 2008/9 an outlier due to very high fertiliser prices). The choice of prices to use in the estimates are difficult, as this depends upon prices as they unfold from May 2012 to April 2013, which will be complicated by the recent devaluation of the Malawi Kwacha. We use three price scenarios, with average domestic prices of 35MK/kg, 45MK/kg and 55 MK/kg[6]. We also use three incremental yield and production scenarios, the first using incremental production of 18, 15 and 12 kg grain per kg N on hybrid, OPV and local varieties respectively as used as the basis for estimates in past seasons (see SOAS et al, 2008) and the second and third reducing this by 10% and 20% to allow for possible effects of poor rains in some parts of the country.

Table 5 Benefit cost analysis without & with growth multipliers by price & yield scenarios

		BASE			With Growth Multipliers		
Yield	Price MK/kg	Net benefit US$ mill	BCR	FE	Net benefit US$ mill	BCR	FE
Base	35	**99.8**	**1.5**	**0.7**	**162.6**	**1.7**	**1.2**
	45	122.4	1.7	0.9	194.3	1.8	1.5
	55	137.5	1.7	1.0	215.5	1.9	1.6
90% Base	35	51.7	1.3	0.4	95.3	1.4	0.7
	45	**87.0**	**1.5**	**0.6**	**144.8**	**1.6**	**1.1**
	55	102.1	1.5	0.8	165.9	1.7	1.2
80% Base	35	10.7	1.1	0.1	37.9	1.2	0.3
	45	51.7	1.3	0.4	95.3	1.4	0.7
	55	**66.8**	**1.4**	**0.5**	**116.4**	**1.5**	**0.9**

Note: lower yields likely to lead to higher maize prices - most likely yield & price combinations in bold

Table 5 sets out estimated returns for different scenarios, first without allowance for growth multipliers and then with allowance for growth multipliers. Since lower yields are likely to lead to higher prices the most likely yield and price combinations are highlighted in bold. A wide range of returns are possible, depending upon scenario, but the most likely scenarios give benefit cost ratios of around 1.5 without

[5] It should however be noted that it does not take account of benefits arising from impacts on wages.

[6] The two lower prices are lower than an export parity price estimated from SAFEX futures prices minus a transport cost of US$50/MT (assuming export within the region) and hence some of the incremental production is valued at this price.

allowance for growth multipliers and 1.6 with allowance for growth multipliers. These are similar returns to revised estimates for 2010/11 allowing for lower prices than predicted in initial estimates in Dorward and Chirwa (2011).

As in Dorward and Chirwa (2011), the main conclusions to be drawn from this analysis are that the FISP is a programme with the potential to be of enormous benefit to Malawi. These benefits and their estimation are, however, sensitive to incremental yield, displacement and maize prices. Available evidence suggests that as it is currently implemented the programme provides significant net benefits. These could, however, be substantially increased if incremental yields were increased. They are also threatened by potential capture of subsidised inputs, or of benefits from access to them, by others, apart from poor smallholder farmers for whom they are intended.

8. Conclusions

This report has presented a review of 2011/12 FISP implementation and an estimate of the benefits and costs of the programme.

The programme, already a large, complex and challenging operation, faced particular challenges as a result of foreign exchange difficulties and fuel shortages, difficulties which also affected the availability and prices of unsubsidised fertiliser, placing increased demand pressures on subsidy supplies and disbursement. Implementation of the programme in this context was a substantial achievement. However difficulties with foreign exchange rates and availability and with transport nevertheless did lead to delays in fertiliser procurement and uplifts to markets. These difficulties were compounded by the programme not being able to open before the end of October, early by previous years but still not early enough, earlier opening being constrained by the timing of voucher distributions and market openings.

Coupon printing was conducted in the UK with much improved security features and tighter distribution systems. These appear to have substantially reduced the number of counterfeit vouchers submitted, but there were still high rates of fake voucher redemption in a small number of districts. There were also anecdotal reports of substantial delays and widespread demands by market staff for illegal 'top up' payments for redemption.

Fertiliser sales from stock records were just below the reduced budget, at 139,900 MT. Maize seed sales (1.39 million packs, 5,643 MT of hybrid seed and 2,602 MT of OPV seed) and legume seed sales (1.3 million packs, 2,602 MT mainly groundnuts seed) were a little below budget. Estimated expenditure on the FISP before farmer repayments on fertiliser purchases in 2011/12 was MK24.9 billion (US$149.1 million), including donor funded activities, similar to 2010/11 costs. However direct donor contributions increased in as a result of significant direct funding of fertiliser procurement.

Using different price and yield scenarios, estimated benefit cost ratios range from 1.1 to 1.7 without any allowance for multipliers from growth linkages, and from 1.2 to 1.9 with allowance for growth multipliers, with the most likely estimates roughly in the middle of these ranges. Estimated benefit cost ratios (BCRs) are sensitive to incremental yields and prices, while net present value (NPV) and fiscal efficiency (FE) estimates are also sensitive to the extent of displacement of unsubsidised by subsidised input sales.

The analysis suggests that there are several options for improving the implementation of the programme including:

- Measures that allow shorter bid validity periods and faster tender processing and awards should allow lower tender prices. They would also allow earlier delivery of supplies.
- Shortage of depot space, the result of limited storage within SFFRFM and of slow uplifts from depots to markets, could be addressed by making greater use of retail sales by private retailers.
- Earlier beneficiary identification, voucher distribution and opening of the programme markets could also ease these depot space shortages and transport constraints, reduce pressures on

markets, reduce the time that farmers spend queuing (with attendant demands and pressures for the evils of additional payment of 'tips' for redemption) and allow earlier planting and fertiliser application, which usually leads to higher yields (though this was not the case in some areas in 2011/12).

- The measures taken to improve voucher security are strongly endorsed, but there is need for more robust systems enforcing controls at markets.
- Action to ensure greater availability of legumes preferred by farmers.
- There is scope for substantial increases in returns to the programme from measures that will raise incremental yields (such as earlier programme implementation as outlined above) and reduce costs. It is also important to prevent capture of subsidised inputs, or of benefits from access to them, by corrupt and criminal activity in the supply chain.

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Glossary of Acronyms and Terms

ADMARC	Agricultural Development and Marketing Corporation
agro-dealers	Small scale private input retailers
AISP	Agricultural Input Subsidy Programme
DFID	Department for International Development
FE	Fiscal efficiency
FISP	Farm Input Subsidy Programme
LU	Logistics Unit
MK	Malawi Kwacha
MoAIWD	Ministry of Agriculture and Food Security
NPV	Net Present Value
NSO	National Statistical Office
OPV	Open pollinated varieties (of maize)
SFFRFM	Smallholder Farmers' Fertilizer Revolving Fund of Malawi

Appendix: Supplementary tables

Table A1: Timing of fertiliser deliveries and sales

(% of total parastatal sales)

	2005/6	2006/7	2007/8	2008/9	2009/10	2010/11	2011/12
Cumulative Depot receipts							
End Sept	n.a.	16%	48%	29%	53%	55%	37%
End Oct	n.a.	32%	55%	49%	77%	79%	63%
End Nov	n.a.	77%	72%	69%	97%	91%	84%
End Dec	n.a.	95%	85%	91%	100%	100%	95%
Cumulative Depot uplifts							
End Oct	n.a.	7%	39%	61%	50%	69%	36%
End Nov	n.a.	64%	70%	75%	81%	86%	75%
End Dec	n.a.	96%	85%	91%	96%	98%	92%
Cumulative Sales							
End Nov	n.a.	8%	n.a.	33%	41%	35%	n.a.
End Dec	47%	74%	64%	72%	85%	92%	n.a.
End Jan	n.a.	96%	88%	94%	98%	98%	n.a.

Table A2: Beneficiary registrations by district, 2011/12

	MoAIWD Farm families	Target	% by district	% Female	% Male	% Un-known	Beneficiaries as % MoAIWD farm families	Beneficiaries as % NSO rural households
Chitipa	62,682	26,340	2%	31%	68%	1%	42%	62%
Karonga	66,852	23,082	2%	33%	66%	0%	35%	36%
Likoma	2,271	1,100	0%	50%	50%	0%	48%	50%
Mzimba	254,389	93,451	7%	46%	54%	0%	37%	59%
Nkhata Bay	62,099	21,100	2%	31%	69%	0%	34%	47%
Rumphi	44,668	25,700	2%	36%	64%	0%	58%	64%
NR Total	**492,961**	**190,773**	**14%**	**39%**	**60%**	**1%**	**39%**	**49%**
Dedza	233,942	59,200	4%	46%	49%	5%	25%	38%
Dowa	235,238	63,700	5%	30%	70%	1%	27%	48%
Kasungu	290,462	79,090	6%	38%	62%	0%	27%	57%
Lilongwe	428,058	140,300	10%	36%	63%	1%	33%	47%
Mchinji	176,295	61,099	4%	35%	65%	0%	35%	57%
Nkhota Kota	88,477	27,697	2%	34%	65%	0%	31%	41%
Ntcheu	159,660	64,000	5%	46%	54%	0%	40%	52%
Ntchisi	123,289	35,700	3%	34%	62%	4%	29%	69%
Salima	100,383	32,383	2%	36%	64%	0%	32%	39%
CR Total	**1,835,804**	**563,169**	**40%**	**37%**	**62%**	**1%**	**31%**	**42%**
Balaka	125,444	46,800	3%	56%	44%	0%	37%	58%
Blantyre	184,720	82,600	6%	60%	40%	1%	45%	100%
Chikhwawa	127,794	16,890	1%	36%	64%	0%	13%	16%
Chiradzulu	114,209	45,990	3%	60%	39%	0%	40%	61%
Machinga	209,225	56,900	4%	52%	48%	0%	27%	46%
Mangochi	268,052	66,270	5%	58%	41%	0%	25%	34%
Mulanje	177,007	66,769	5%	47%	52%	0%	38%	50%
Mwanza	29,415	13,530	1%	56%	44%	0%	46%	54%
Neno	35,159	15,200	1%	53%	47%	0%	43%	54%
Nsanje	73,172	13,310	1%	34%	66%	0%	18%	24%
Phalombe	98,003	52,700	4%	55%	45%	0%	54%	64%
Thyolo	167,245	88,766	6%	57%	43%	0%	53%	58%
Zomba	232,247	79,824	6%	61%	38%	1%	34%	53%
SR Total	**1,841,692**	**645,549**	**46%**	**55%**	**44%**	**1%**	**35%**	**44%**
Unallocated	0	509						
National Total	**4,170,457**	**1,400,000**	**100%**	**46%**	**53%**	**1%**	**34%**	**44%**

* Calculated from Logistics Unit (2012), NSO (2008), 2008 census, excludes Mzuzu, Lilongwe, Zomba and Blantyre City households but includes urban households in district towns

Table A3: Fertiliser voucher redemption per farm family by region and season

	2005/6	2006/7	2007/8	2008/9	2009/10	2010/11	2011/12
Vouchers / MoAIWD farm family							
North	1.30	1.51	1.55	1.45	0.85	0.86	0.80
Centre	1.05	1.28	1.42	0.98	0.67	0.67	0.61
South	0.49	0.73	0.96	1.06	0.83	0.81	0.70
All	0.80	1.04	1.22	1.08	0.76	0.75	0.67
Vouchers / NSO rural household							
North	1.66	2.07	2.44	2.18	1.29	1.27	1.10
Centre	1.29	1.65	2.02	1.44	1.15	1.14	0.95
South	0.70	1.02	1.32	1.41	1.20	1.16	0.99
All	1.06	1.41	1.75	1.52	1.19	1.17	0.99

Note: NSO rural household estimates are calculated from district estimates and include urban areas outside cities.
Source: Calculations from Logistics Unit (2012), NSO(2008)

Table A4: MoAIWD farm family and NSO household growth rates by region by season

	2005-6	2006-7	2007-8	2008-9	2009-10	2010-11	Average
MoAIWD farm families							
North	7.31%	14.93%	0.14%	4.82%	1.01%	-2.73%	4.09%
Centre	5.26%	10.80%	8.27%	20.19%	1.71%	-4.70%	6.65%
South	-0.88%	-1.74%	0.93%	10.66%	2.43%	0.40%	1.89%
All	2.53%	5.11%	3.84%	13.99%	1.94%	-2.27%	4.08%
NSO rural households							
North	0.07%	0.07%	0.07%	3.54%	3.42%	3.73%	2.71%
Centre	0.07%	0.07%	0.07%	2.79%	2.71%	3.30%	2.50%
South	0.07%	0.07%	0.07%	2.09%	2.05%	2.16%	1.93%
All	0.07%	0.07%	0.07%	2.55%	2.49%	2.83%	2.26%

Note: Change in NSO rural household growth after 2007/8 due to 2008 census information
Source: Calculations from Logistics Unit (2012), NSO(2008)