

- the complementary service coordination and seasonal finance challenges are market failures that inhibit input use, so that the gains from subsidies addressing input affordability problems have the potential to exceed deadweight and implementation costs;
- inelastic demand for food staples means that (a) deadweight losses should be relatively low and (b) many of the gains of producer subsidies should accrue to poor consumers - if subsidies increase production on a sufficiently large scale to lower prices – and in this way input subsidies can provide a means for addressing the food price/productivity tightrope.
- they can, in the right agro-ecological conditions and with proper management, lead to substantial productivity and production increase

This last point is important, in the context of arguments by Dorward et al (2004), in their review of successful and partly successful green revolutions, that state interventionist approaches (including input subsidies) will not be effective, or will be less effective, if they are implemented in situations where basic conditions necessary for development have not been established, with (a) technologies and management and soil, climate and pest conditions, that generate sufficient productivity gains and (b) complementary infrastructure and institutions to support extension services and market activities¹⁶. This ties in with earlier arguments regarding potentially large deadweight costs from producer oriented subsidies in remote areas to suggest that input subsidies are likely to be more effective in areas with more favourable agro-ecological conditions for high response cereals and with good market access and higher population densities. This approach is articulated in recent thinking regarding prioritising investments in 'breadbasket areas' in Africa (AGRA, 2008). This is not to say, however, that input subsidies will never be warranted for cash crops or outside breadbasket areas – there may be market failures inhibiting input led productivity growth which warrant input subsidies – but the nature of such subsidies are likely to differ from those aimed at stimulating input led productivity growth in staple crops for the principle benefit of poor food buyers.

9.2.3 Rethinking input subsidies - theory and practice

Rethinking of the role of subsidies and the introduction of smart subsidies requires a revisiting of some of the conventional thinking about input subsidies as set out earlier in section 9.1. This is not to suggest that the earlier analysis or the insights it yields are faulty, but that it does not adequately reflect the ways that different subsidy systems can work and impact on producers and consumers. We extend the analysis of section 9.1 by considering a number of features of current subsidy programmes that are not explicitly or adequately considered in the theoretical

¹⁶ Dorward et al (2004) also note the need for implementation that is both effective and sustained long enough to achieve systemic structural changes in productivity and markets.

considerations outlined earlier:

- the role of subsidies in reducing input profitability problems;
- the role of subsidies in reducing input affordability problems;
- targeting of input subsidies to specific household types;
- rationing of input subsidies;
- impacts of subsidies on input supply systems;
- dynamic effects of subsidies on pro-poor growth;
- subsistence production and net deficit producers;
- leakages and secondary markets;
- entitlement and distribution systems;
- complementary investments, policies and instruments
- soil fertility replenishment
- the political economy of input subsidies.

9.2.3.1 The role of subsidies in reducing input profitability problems

We can identify four ways in which the profitability of input use may be improved, by:

1. Raising physical productivity of inputs – through adaptation of technologies and farmers’ learning how to manage them, and when (and when not) to use them.
2. Reducing the costs of inputs by increasing efficiencies in (for example) fertiliser or seed production and/or delivery systems.
3. Reducing farmers’ input costs through input subsidies.
4. Increasing output prices through market interventions (with either high consumer prices or with subsidies funded by tax payers).

Conventional thinking on input subsidies emphasises their role in improving the profitability of input use primarily through approaches 1 and 3 above in order to (a) address farmers’ limited knowledge first of input benefits and second of their correct usage, (b) improve agricultural profitability in more remote areas, and (c) counteract taxes on agriculture through export tariffs, managed exchange rates and controls on domestic prices. While *profitability constraints* on input use on food crops continue to be important, the nature of these constraints has changed, and (as will be discussed later) at the same time *affordability constraints* have become more important.

We discuss these two changes in turn. We note that different analysis may be needed for different inputs and consider first issues related to fertiliser subsidies before briefly mentioning differences with seed subsidies.

On the changing nature of *profitability constraints* with regard to fertilisers, we

consider first constraints to farmer purchases as a result of lack of knowledge of fertiliser benefits and of their correct usage. After many years in which fertilisers have been promoted through subsidies, it is generally no longer the case that most farmers are unaware of fertilisers' benefits, indeed lack of access to fertiliser is commonly cited by farmers as a major constraint on their agricultural production. The extent to which farmers have direct experience of fertiliser use will vary, but past subsidy, demonstration and hand-out programmes together with fertiliser purchases by less poor farmers for cash crop production mean that in most areas there are farmers with direct experience of fertiliser use, and observation and reports of fertiliser use are widespread. Farmers' ability to use fertilisers effectively and efficiently (through proper selection of fertiliser types, appropriate timing and method of application, and use of complementary investments in, for example, soil and water management and crop varieties) is more variable, and input subsidy programmes continue to have a potential role in helping farmers to learn from experience here. This is likely to be particularly the case with poorer farmers who do not have access to fertilisers for cash crop production and who are also less able to access improved seeds and extension advice. However if fertiliser subsidy programmes are to help farmers improve their use of fertiliser then this requires subsidised provision of appropriate fertilisers and timely implementation supported by complementary investments in extension services and in promotion of improved soil and water management and crop varieties. Seed subsidies have an important and more conventional 'profitability' role in promoting both achievement and knowledge of higher returns from fertiliser use and of higher returns from their own use in conjunction with fertiliser.

The high costs of fertilisers (as a proportion of crop production costs) mean that (perceived and actual) profitability of their use is strongly influenced not only by (perceived and actual) physical returns or responses to fertiliser use (discussed above) but also by relative fertiliser and crop prices. Relative global prices of crops and fertilisers have fluctuated over the last 40 years but do not show any systemic changes¹⁷. Relative domestic prices, however, will have changed in different ways in different countries: liberalisation policies from the 1980s will have generally led to higher food and fertiliser prices (due to exchange rate devaluations) but changes in relative prices will have been affected by continuing interventions in food markets, by differences in produce and input domestic market linkages to world markets, and by differences in import tariff rates. It is therefore not possible to generalise as regards declining or increasing profitability of unsubsidised fertiliser use over the last 30 years. However variability in food prices is a major issue in many countries. Risks of low food prices leading to low profitability of fertiliser use may depress fertiliser use in less poor farmers' production of surplus food for the market. While fears of high food prices may make fertiliser use more profitable for poorer food

¹⁷ There are differences, however, for some specific fertilisers –phosphate prices, for example, increased much more than nitrogenous fertiliser prices in the recent price spike.

deficit farmers, use of fertiliser by such farmers is more likely to be constrained by *affordability* constraints arising from problems in accessing seasonal finance, to which we now turn.

9.2.3.2 The role of subsidies in reducing input affordability problems

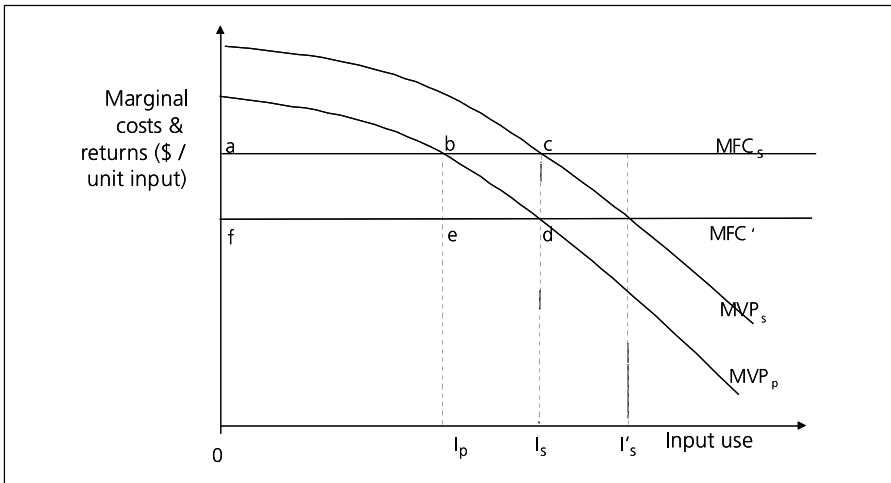
As noted in section 9.2.2 above, access to seasonal finance is widely considered to be a major constraint on input use on staple food crops, especially among poorer farmers. We describe this in terms of difficulties with the *affordability* of inputs. In theory farmers can finance input purchases from farm savings, from non-farm income sources or by borrowing (Poulton and Dorward, 2008). However (particularly poorer) small farm households are rarely able to save enough to fund significant intensification, and few have access to sufficient non-farm income sources for this purpose. Credit has therefore long been recognised as a priority to support input purchases and agricultural intensification (see for example Feder et al. 1985) and state provision of subsidised seasonal credit services were a significant part of the bundle of subsidised services, with input provision, in successful green revolutions (Dorward et al, 2004; Djurfeldt et al., 2005). Severe (and justifiable) criticism of agricultural credit programmes (for example Adams and Vogel 1986; Yaron 1992) as fiscally unsustainable (with a large subsidy component and major repayment problems), and regressive (with the majority of loans going to well-connected, wealthy borrowers and limited benefits to poor households) led to their demise. The abolition of these programme has not, however, led to their replacement by private sector and micro-finance services for staple food crop production, although there have been and continue to be successful models for delivery of seasonal finance to non-staple producers (where higher value crops give limited numbers of produce buyers incentives to invest in smallholder production).

The absence of complementary financial services allowing farmers to access credit to finance the significant costs of purchasing fertiliser means that only if subsidies lead to sufficiently large reductions in fertiliser prices will they lead to increased access to fertilisers by poorer farmers. If subsidies lead to smaller reductions in fertiliser prices which do not make them affordable by poorer farmers then they are likely to mainly benefit less poor farmers whose use of unsubsidized fertiliser is less constrained by lack of knowledge of how to use fertilisers or by inability to finance their purchase.

We examine this using analysis of input use comparing marginal value products and marginal factor costs. We begin by considering conventional analysis of the profitability impacts of a subsidy as shown in figure 9.2. The basic Marginal Value Product and Marginal Factor Cost of input use in the economy are shown by MVP_s and MFC_s respectively. The economically optimum use of inputs will be at the point where $MVP_s = MFC_s$, with input use I_s . A subsidy may be warranted, however, if information failures (lack of knowledge about inputs and their use) cause farmers

to perceive that they will achieve a lower Marginal Value Product from input use (MVP_p) causing them to apply input use up to the point I_p , a suboptimal use of inputs. A subsidy which lowers the price of inputs and hence the MFC from MFC_s to MFC' would result in farmers increasing their input use to the point where $MFC' = MVP_p$, which is the economically efficient rate of input use, I_s .

FIGURE 9.2
Conventional marginal analysis of input subsidy impacts



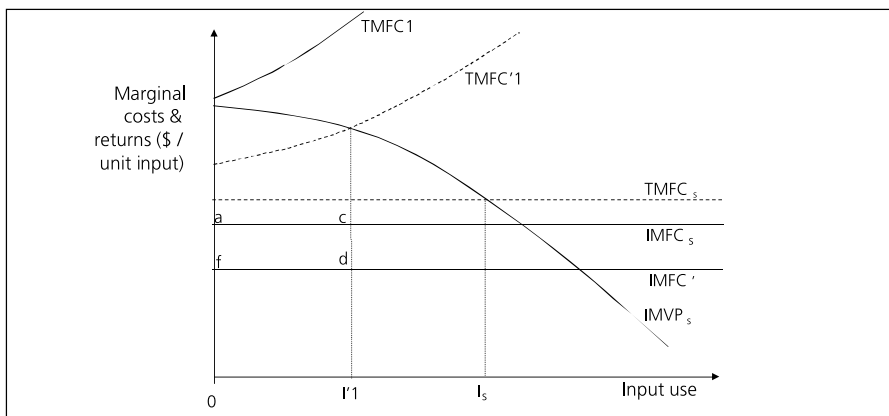
Inefficiencies in the subsidy can be seen in two ways. First, if there are some farmers who have a correct understanding of the benefits of input use, then these will apply inputs up to the rate I_x , where $MFC' = MVP_s$, and this will be an inefficient over-use of inputs. Second, the total cost of the subsidy per farmer (assuming that all farmers apply inputs at I_s) will be the total amount of input used multiplied by the subsidy per unit input, represented by the rectangle $acdf$. However of this only the expenditure represented by the triangle bcd is actually stimulating increased input use, the remainder (represented by the area $abdf$) represents a transfer to producers (assuming no output price changes, ie perfectly elastic demand)¹⁸.

We now extend this analysis by introducing affordability constraints in figure 9.3 with steeply rising credit interest and transaction costs above the marginal factor cost of input purchases.

¹⁸ If demand is inelastic then output prices will fall with some of the subsidy cost providing benefits to consumers.

The basic Marginal Value Product and Marginal Factor Cost of input use in the economy are shown in figure 9.3 by $IMVP_s$ and $IMFC_s$ respectively, but the total marginal factor cost of input use ($TMFC_s$) lies above $IMFC_s$ as a result of social costs of credit transactions and interest¹⁹. The economically optimum use of inputs will be at input use I_s where $MVP_s = TMFC_s$. Poor households, however, face very high interest and transaction costs when borrowing short term capital (and they have very limited capital of their own, with high opportunity costs) and therefore have a much higher total marginal factor costs, shown by $TMFC_1$, leading to very much lower input use, which is often zero (as shown in figure 9.3). In such circumstances an input subsidy which substantially reduces the capital requirements and costs of input purchase can make input purchases possible for such households, as shown in figure 9.3 by a subsidised input marginal factor cost of $IMFC'$, leading to a lower Total Marginal Factor Cost ($TMFC'1$) and input use of $I'1$. Note that the cost of the subsidy for these households is represented in figure 9.3 by the area $acdf$ (the quantity of input multiplied by the per unit subsidy) and a large proportion of this (the area between $TMFC'1$ and $IMVP_s$) is directly stimulating extra input use.

FIGURE 9.3
Input subsidy marginal analysis for capital constrained households

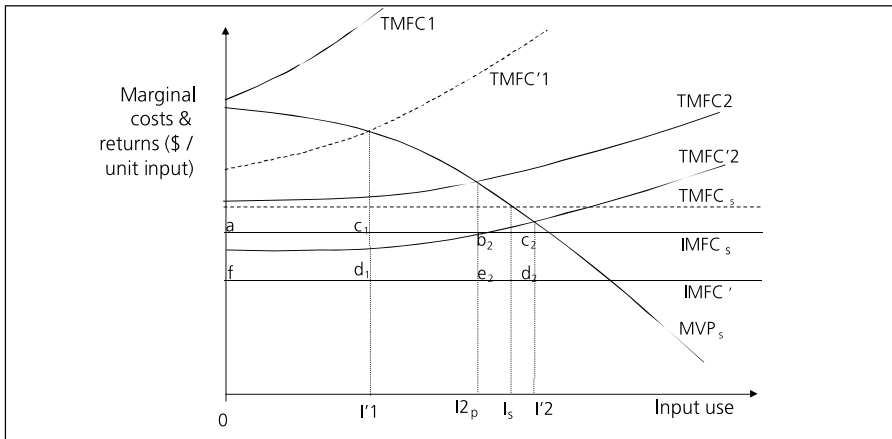


Not all households, however, are credit constrained and face high capital costs in the same way. The situation for such households is shown in figure 9.4: the Total Marginal Factor Cost curve without the subsidy ($TMFC_2$) is only a little above society's Total Marginal Factor Cost ($TMFC_s$) so that for this household the subsidy

¹⁹ Marginal transaction and interest costs (the difference between $TMFCs$ and $IMFCs$) are shown as constant irrespective of amount of input applied. It could be argued that these would fall somewhat with increasing quantities of inputs applied but the broad analysis presented here would not be affected if this were the case.

leads to a new Total Marginal Factor Cost (TMFC'2) below $TMFC_s$ so that their optimal input use at $I'2$ is greater than the economic optimum I_s . The total cost of the subsidy to these households is ac_2d_2f , and of this only a very small proportion is directly stimulating extra input use (a part of $b_2c_2d_2e_2$, which is itself a small part of the total cost).

FIGURE 9.4
Marginal analysis for more and less capital constrained households



This analysis of the differential economic costs and benefits from directing input subsidies to farmers facing different constraints is important as it suggests that programme efficiency and effectiveness in stimulating increased input use can be improved by smart subsidies that reduce the quantities of input subsidies received by less constrained farmers. This can be achieved in two ways: by targeting and by rationing.

9.2.3.3 Targeting of input subsidies to specific household types

The analysis set out in figures 9.2 to 9.4 suggests that the efficiency of an input subsidy programme can be improved in two ways by targeting of the input subsidy to specific types of farmer, if this ensures that it is directed to farmers (a) who would otherwise (as a result of credit market or information failures) use very little or no inputs and (b) who will increase their input use substantially as a result of the subsidy. Condition (a) reduces the proportion of the input subsidy that is simply a transfer to producers who get cheaper inputs than they would have purchased anyway without the subsidy (with subsidised input purchases *displacing* unsubsidised purchases), while condition (b) means that those to whom the subsidy

is targeted do use it to increase input use. The combination of condition (a) with (b) should also reduce incidences where a subsidy leads to overuse of inputs (beyond levels that are economically optimal).

The marginal analysis in figures 9.2 to 9.4 is however restricted in that it assumes that output prices are not affected by the subsidy, or, in terms of previous discussion, that output demand is perfectly elastic. This can be explored by introducing another (lower) MVP curve into figure 9.4 to represent the effects of lower output prices where a subsidy increases production and output demand is not perfectly elastic: this should have the effect of reducing input use ($I'(1)$ and $I'(2)$) somewhat. The effects of subsidy targeting where output demand is not perfectly elastic are, however, more helpfully explored by investigating targeted subsidy impacts on output supply and demand and on consumers and different producers, as in figure 9.5.

FIGURE 9.5
Targeted subsidy impacts on output supply and stakeholder welfare

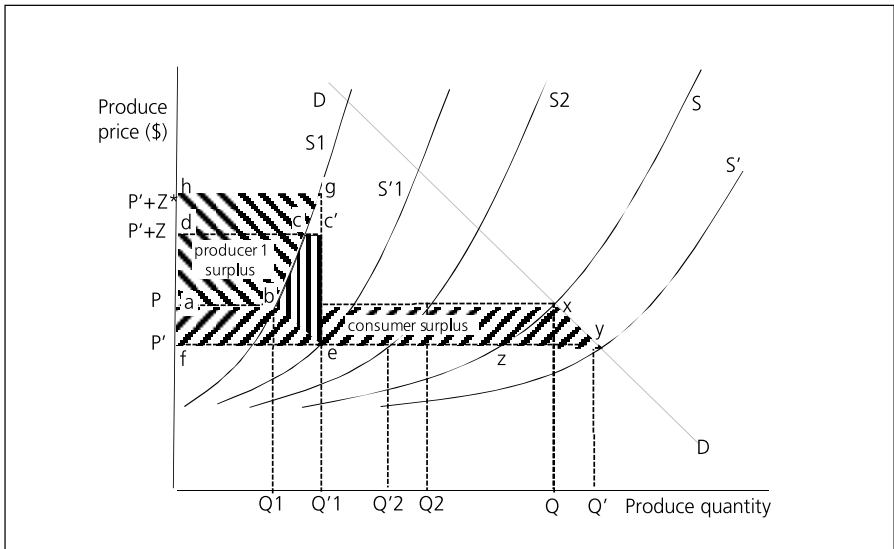


Figure 9.5 shows the effects of a targeted subsidy where the subsidy is provided to poorer, capital constrained producers with supply curve $S1$ which shifts to $S'1$ with an input subsidy which costs the government $\$Z$ per unit output but which effectively reduces production costs by $\$Z^*$ per unit output ($Z=Z^*$ unless the subsidy addresses a market or information failure in which case $Z<Z^*$, as shown in the figure). The result of this is an expansion of overall supply S to S' ($S = S1 + S2$ and $S' = S'1 + S2$, horizontal summation). The output price therefore falls, leading to a

gain in consumer surplus as shown by $axyf$. Subsidised producers also gain producer surplus, as shown by 'producer 1 surplus' ($abgh$). The gain in consumer welfare is achieved largely as a result of a transfer from producers who experience a fall in producer surplus as a result of lower prices (with a net welfare loss for unsubsidised producers). The total cost of the subsidy (represented graphically by $fec'd$) therefore leads to producer and consumer welfare gains equal to the area shaded as producer 1 surplus plus the extra consumer surplus less the transfer from unsubsidised producers (xyz): the net gain from the subsidy is then the extra gain in producer surplus 1 due the difference between Z and Z' ($dcgh$ plus xyz) less the deadweight cost ($bec'c$) and this will be determined by the extent of the market/ information failure being addressed by the subsidy and on recipient and non recipient producer characteristics, and upon their relative numbers.

As compared with an untargeted subsidy (as represented in figure 9.1) it should be noted that not only is this likely to be more economically efficient and effective, it also involves a transfer from less poor producers and tax payers to poorer producers and consumers (assuming that the subsidy is increasing production of a staple food crop). It might be argued that less poor producers should be compensated for this – and allowing them access to the subsidy is one way of doing this. The extent to which less poor producers actually lose from a fall in producer prices depends upon alternative activities open to them (affecting elasticity of supply).

Much of course also depends upon the effectiveness of targeting and upon likely thresholds of minimum subsidy rates (or maximum input prices) for inputs to become affordable for poorer producers. These thresholds and political and power relations often result in smaller across the board subsidies being captured to a significant extent by less poor producers. In such circumstances poor consumers (some of whom may also be poor producers) will benefit if the subsidy leads to lower staple food prices, but any poor producers who are net produce sellers will lose from lower prices for their products.

The targeting of subsidized inputs to different groups or types of people is, however, a critical and sensitive issue, and there are significant costs and difficulties in targeting of subsidized inputs to different groups or types of people. In this it is helpful to distinguish between geographical targeting (between regions, districts and different geographically defined communities) and intra-community targeting (between different categories of people or households within communities). Geographical differences between areas and communities will often be correlated with socio-economic and cultural differences between these areas and communities. The distribution of subsidized inputs between different categories of people then depends upon the interaction of formal criteria determining geographical targeting and intra-community targeting together with 'informal' de facto criteria and mechanisms which are actually implemented. Costs of geographical targeting will generally be much lower than intra-community targeting. The relative effectiveness

of these targeting approaches (in terms of inclusion and exclusion errors) depends upon inter- and intra- community differences and social, political and cultural factors. Targeting inevitably creates political tensions, with the relative threats posed by geographical and intra-community targeting again depending upon national, regional and local social, political and cultural factors. Targeting will also commonly lead to secondary markets for inputs where recipients sell subsidised inputs to non-recipients. The effects of such markets are discussed later in section 9.2.3.8.

The serious political, economic, welfare, and equity issues associated with targeting mean that targeting criteria and methods have to be constrained by political concerns and practicalities (at national, regional and community levels), by programme objectives (for example production, growth, or social protection objectives), and by the feasibility and costs of targeting. There may be arguments for comprehensive or area targeting that delivers smaller quantities of inputs (or of entitlements to inputs) to all households or farmers in a country or area.

A final comment on targeting is needed on the relative efficiencies of input use by poor and less poor producers. It is often thought that poorer producers make less efficient use of inputs than better off producers, and hence that targeting of input subsidies to poorer producers is less efficient than targeting them to less poor producers. It has been argued above that targeting poor producers has major benefits in terms of ensuring that subsidies address market failures (reducing displacement, and increasing welfare and distributional benefits). These arguments will, however, be undermined if poor producers make less efficient use of inputs than less poor producers. It is therefore important to note here that there is a very large literature examining the relative efficiency of large and small smallholder farms, where larger farms are generally less poor than smaller farms (see for example Hazell et al, 2007). There is no universal relationship between farm size and efficiency, in some circumstances smaller, poorer farms are found to be more efficient, in other circumstances to be less efficient. However there is substantial empirical evidence supported by a continually evolving body of theory that smaller, poorer farms tend to be more efficient in the cultivation of labour intensive staple crops in poor rural economies, and larger farms tend to be more efficient in the cultivation of capital and market intensive higher value cash crops. This suggests that where input subsidies are aimed at promoting staple food production (where input subsidies are most likely to address market failures and promote wider consumer benefits as argued in section 9.1) then targeting them at poorer producers will often lead to greater production efficiency in their use as well as more efficient wider benefits.

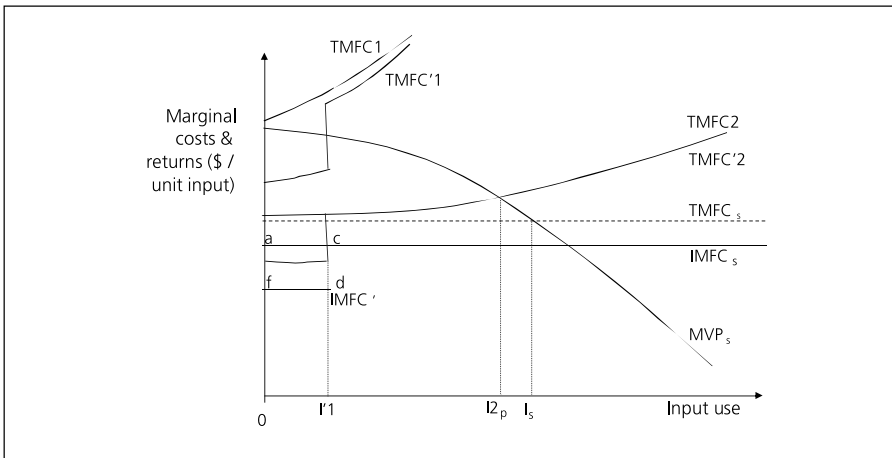
9.2.3.4 Rationing of input subsidies

Analysis in section 9.2.3.2 of the differential economic costs and benefits from directing input subsidies to farmers facing different constraints suggested that smart subsidies which reduce the quantities of input subsidies received by less

constrained farmers could improve programme efficiency and effectiveness in stimulating increased input use by targeting and by rationing. Having analysed the effects of targeting in section 9.2.3.3, we now turn to consider the effect of rationing, with or without targeting. For this we return to the marginal analysis used earlier in section 9.2.3.2.

Figure 9.6 shows that a rationed input subsidy on $I'1$ inputs can stimulate input use and production for capital constrained households (raising input use from 0 to $I'1$) and that production by other households is unaffected (at $I2_p$), with receipt of subsidised inputs displacing inputs that would have been bought anyway without any subsidy. Figure 9.7, analysing produce supply effects of a rationed subsidy, also shows that a rationed subsidy does not affect input use or production by less poor producers (for whom it displaces unsubsidised purchases), it only leads to increased input use and production by capital constrained producers. This drives down prices to the benefit of consumers at the expense of producers. Producer losses from lower prices are, however, offset by gains from receipt of the subsidy.

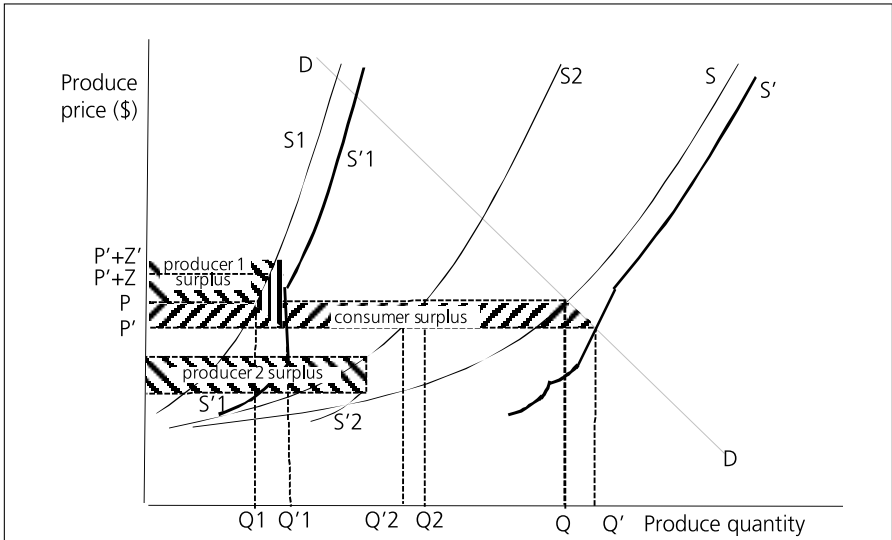
FIGURE 9.6
Marginal analysis of rationing of input subsidies



If the subsidy is targeted only to capital constrained producers this will lead to loss of welfare for other (less poor) producers, with substantial reductions in subsidy costs and limited impact on production or produce prices and hence increased economic efficiency of the programme (as compared with universal provision). There will, however, be political economy costs as less poor producers will be direct losers from the programme. We can also analyse contrasting situations where there is no explicit targeting of poorer producers and indeed poorer households have more limited access to the subsidy than less poor households in terms of de facto

targeting to less poor households. This will lead to almost no incremental use inputs or production, no price changes or benefits to consumers, and effectively provide a straight income transfer from taxpayers to less poor producers.

FIGURE 9.7
Rationed subsidy impacts on output supply and stakeholder welfare



Rationing, whether targeted or universal, is only effective where there are no (or limited) secondary markets in which recipients sell subsidised inputs to non-recipients. The effects of such markets are discussed later in section 9.2.3.8.

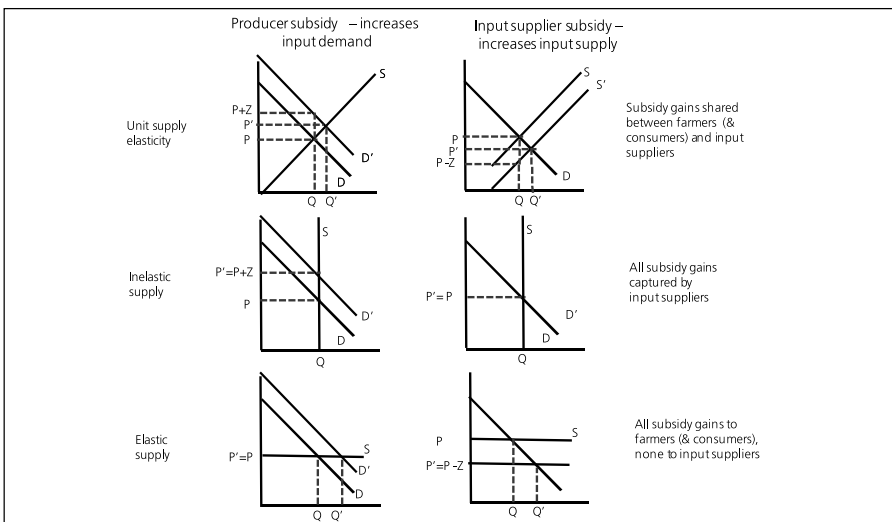
9.3.2.5 Effects of subsidies on input supply systems

Effective large scale input subsidies should lead to substantial increases in volumes of inputs purchased by farmers, and this can have a number of different impacts on input supply systems and markets. We consider three different beneficial processes and impacts, and two damaging process.

First, the short run effects of an input subsidy on the input market depend upon the nature of the subsidy and on the structure of the input supply system. If the subsidy is provided to farmers this has the effect of shifting input demand upwards. Alternatively input subsidies may be provided to input suppliers (India, for example, has used fertiliser subsidies to domestic producers to develop and protect its fertiliser industry, Fan et al 2007). The effects of this on the input market depend upon input supply elasticity, and this in turn will depend upon structure, conduct

and performance in domestic production and imports. This varies between countries and between different kinds of inputs. Few African countries produce fertiliser, with local fertiliser suppliers either importing blends or blending particular formulations from imported raw materials. Price elasticities for imported fertilisers should be very high, unless there are either significant importation costs and limited importation capacity (as may be the case for land locked countries, in which case increased input demand will bid up importation costs and revenues (rents) in importation, for example transport) or limited competition between importers (in which case increased input demand will bid up revenues (rents) of importers). The situation is often very different with seed supply, where imports are impeded by national seed certification controls and there is limited domestic capacity in seed production, with long multiplication lead times. Short and long run supply elasticities also differ (with greater long run elasticity). More elastic input supply leads to more of a subsidy accruing to producers (see figure 9.8), with gains for producers (and/ or consumers, as discussed earlier). More inelastic supply, whatever its cause, leads to increased subsidy capture by input suppliers and reduced benefits to producers and/ or consumers. Clearly agricultural development benefits from input subsidies are increased by more elastic input supply and decreased by inelastic input supply.

FIGURE 9.8
Effects of different input supply elasticities



The second process by which input subsidies can impact beneficially on input supply systems involves first the realisation of economies of scale across the industry and within particular suppliers (as a result of increased volumes) and second the benefits of competition in increasing efficiency and reducing marketing margins

where increased volumes attract new entrants into the input supply business. These benefits should accrue to both subsidised and unsubsidised supplies of the same inputs, and expand supply, pushing supply curves down and to the right, with increasing supply elasticity. These processes of realising economies of scale and competition of course depend upon the nature of the inputs and their supply systems, and upon the ways in which subsidised inputs are acquired and disbursed (for example through general price support, voucher systems or direct issue with distribution involving government institutions, input supplier cartels, or competitive input markets). It should be noted that government supply is not incompatible with realisation of economies of scale in subsidised input disbursement, but the spillovers to unsubsidised sales are likely to be limited (unless government also markets these) and lack of competition faced by government organisations (and by cartels) tends to undermine the achievement of such economies.

The third process by which input subsidies can impact beneficially on input supply systems results from the ways that increased input supply and transactions may promote the development of new relationships and forms of relationships among input sellers and buyers in poor rural areas with, for example interlocking arrangements for linking input sellers, seasonal finance providers and produce buyers. Again these processes are critically dependent upon the nature of the inputs and their supply systems, and upon the ways in which subsidised inputs are disbursed, as discussed above. This process can also contribute to wider economic and market activity as increased input market activities have potential spill-overs into other markets (for example expansion of a network selling subsidised inputs may also buy and sell other commodities).

The impacts of input subsidies on input supply systems are not, however, always beneficial. Damaging effects can arise in two main ways.

First, input subsidies may create considerable uncertainty and risks for input suppliers and directly undermine the incentives for private investment in input supply systems. This occurs most obviously when governments intervene directly in input markets through direct supply of subsidised inputs and/or through regulation of input markets. Direct supply of subsidised inputs by government may take away business from private suppliers if there is significant displacement of unsubsidised sales by subsidised sales (and, as discussed earlier, this is common), leading to unsold stocks and lower sales volumes to carry fixed costs²⁰. Regulation of input markets may restrict prices or volumes, or require sales of unprofitable lines or in unprofitable locations – again restricting revenues and increasing costs and risks. .

²⁰ An extreme case of this can arise if access to subsidies is very uncertain or deliveries are very late, such that farmers do not purchase unsubsidised inputs because they expect to obtain subsidised inputs, but then cannot obtain subsidised inputs (either because they are deemed ineligible for the subsidy or because the subsidised inputs do not arrive on time, in sufficient quantities, or in good condition). In such circumstances a subsidy can not only displace unsubsidised inputs but can actually depress total input demand and use.

A second way in which subsidies may damage the development of input supply systems is by distorting incentives so that input suppliers are distracted from investing to compete to expand profitable sales and instead divert resources and investments into competing to expand government contracts to provide subsidised inputs²¹. Unless subsidies are carefully designed to address and indeed exploit this, such investments are unlikely to lead to the development of longer term sustainable supply systems.

The implications of this discussion are that subsidy programmes need to be carefully designed and implemented to promote supply system development in key areas where it needs development, and that long term stable relationships of trust need to be developed between governments and private sector – but these must also promote efficiency. Quick exits and unstable, changeable subsidy programmes are unlikely to induce the private sector investments necessary for supply system development.

9.2.3.6 Dynamic effects of subsidies on growth

Discussion of subsidy impacts in sections 9.2.3.2 to 9.2.3.4 has been largely concerned with 'static' impacts, considering the direct impacts of subsidies on producer costs and decisions, hence on produce supply and prices, and consumer welfare. 'Dynamic impacts' of subsidies on producer knowledge of input benefits and on more efficient use of inputs were mentioned in section 9.1 as a means by which input subsidies can overcome information failures to induce long term change in perceived and actual input profitability and use, allowing subsidies to be withdrawn as producers using subsidised inputs learn about the benefits of inputs and about their efficient use. Such dynamic effects are an important part of conventional thinking about subsidies, and continue to be relevant, though as argued in section 9.2.3.1 lack of knowledge of the benefits of some inputs (such as fertilisers) is less important now than it was in the past. Similarly section 9.2.3.5 considered some dynamic effects of input subsidies on the development of input supply systems alongside more static concerns about the distribution of subsidy benefits between input suppliers and producers.

There are, however, two important potential dynamic benefits of subsidies that have been given much less emphasis in conventional thinking about subsidies.

First, subsidies that are effective in raising land and labour productivity (with overall increases in on-farm labour demand) and in driving down food staples prices (as examined in consideration of output supply effects in sections 9.1 and

²¹There is anecdotal evidence that this may have affected input suppliers in Zimbabwe (concentrating on providing relief inputs subsidised by international donors in the early 2000's) and in Ghana (investing in relations with government for the 2008 subsidy). There is no suggestion that any of these involved corrupt behaviour, but such behaviour demonstrates more extreme incentive distortions.

9.2.3.1 to 9.2.3.4), will raise the real incomes of large numbers of poor consumers as well as raise the incomes of poor producers, and this should expand demand for locally produced non-staple foods (horticultural and animal products) and non-farm goods and services, driving up local labour demand and wages. At the same time increasing staple crop productivity can release resources for the production of non-staple foods (horticultural and animal products) and non-farm goods and services. Such growth multipliers were critical in driving growth in Asia (Hazell and Rosegrant, 2000) and need to be given much greater emphasis in analysis of input subsidy impacts, in particular this requires more emphasis on subsidy impact on food prices and poor consumers or net buyers. It also requires implementation of subsidies over a longer period, to achieve structural change rather than short term productivity gains.

Dorward (2009) describes three dimensions of development: the need for individuals and households, communities and wider economies to maintain their welfare (termed 'hanging in'), a process of advancement by 'stepping up' existing activities by expanding their scale or making them more efficient, and a process of advancement by 'stepping out' into new activities. Both 'stepping up' and 'stepping out' require coordination across and between different scales of economic organisation (so that necessary production inputs and services are available, and so that growing supply is matched by growing demand). They also require a reasonable expectation of ability to 'hang in', so that investment in stepping up and stepping out are not overly constrained by allocation of resources to low productivity hanging in activities. Where agricultural input subsidies contribute to raised land and labour productivity in staple food production, reduced food prices and raised producer incomes they are contributing to coordinated hanging in, stepping up and stepping out in low income rural economies, and thus can play a very dynamic role in promoting wider development, growth and poverty reduction.

The second way that input subsidies can have important potential dynamic benefits is through their stimulation of increased input and output and wider economic activity (as described above) then having positive spillover effects with 'market thickening'. This happens if the greater volume economic activity stimulated by the subsidy reduces coordination and transaction costs and risks and promotes institutional and communications and transport service and infrastructure development (see Dorward et al 2009, Dorward and Kydd 2004, Dorward et al 2004).

Both these potential dynamic benefits of subsidies require longer term and stable implementation of subsidies to induce behavioural and structural change.

9.2.3.7 Subsistence production and net deficit producers

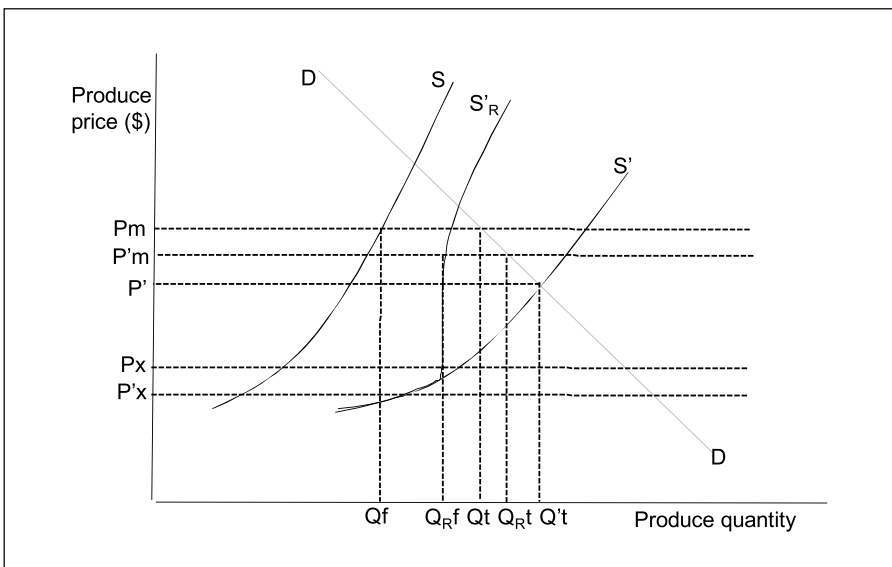
The analysis of input subsidy impacts on output supply and stakeholder welfare

(for example in figures 9.1, 9.5 and 9.7) analyse separately subsidy impacts on output producers and consumers, linked by their interactions in the market. This analysis is, of course, highly stylised. While there is evidence that many staple food markets in southern and eastern Africa are generally reasonably well integrated (Abdulai, 2007), they also tend to be characterised by high margins which inhibit exchange and incentives for surplus production (eg Barrett 2008). This, together with variable staple food prices and limited off farm income opportunities, leads to substantial subsistence production and very large numbers of African farmers (around 50%) who are poor deficit staple food producers and net staple food buyers (Barrett 2008). Such farmers are both producers who can utilise an input subsidy and consumers who benefit from lower food prices.

Figure 9.9 presents a formal analysis of the within-household effects of subsidy receipt, showing the unsubsidised situation with domestic staple food demand D and own supply S , and market purchase price P_m and sales price P_x . The household produces Q_f from its own farm and purchases $Q_t - Q_f$. A widespread subsidy leads to a fall in purchase and sales prices (P'_m and P'_x) and own supply shifts to S' . The household now produces all it needs (Q'_t) at a cost of P' and neither sells nor buys staple food. There is a substantial increase in producer and consumer welfare (and demand may shift as a result of higher income).

FIGURE 9.9

Within household input subsidy impacts on food supply and welfare



The effects of a rationed subsidy are shown in figure 9.9 by the supply curve S'_R with own production of Q_{Rf} , total consumption of Q_{Rt} , and purchases of $Q_{Rt}-Q_{Rf}$ ²².

The relative positions of D and S , the impact of the subsidy and situation of the household as autarchic or a net buyer or seller will differ between households according to household composition (consumers and workers), and access to land and capital. Subsidy impacts in production and consumption by many households will not be fully reflected by changes in quantities bought and sold in food markets, and this may dampen market effects of subsidies when measured in absolute terms. However the significant quantities of produce that are consumed within farm households without reaching markets also means that produce markets may be very thin, so that small % changes in production can lead to very large % changes in market supply and demand, making markets very unstable. This can be important for understanding the food market impacts of input subsidies (and indeed of any policy or natural events that affect smallholder production).

9.2.3.8 Leakages and secondary markets

Leakages were discussed earlier in section 9.1 in terms of cross crop, cross farmer and cross border leakages. These are closely related to the development of secondary markets where recipients of subsidised inputs sell their inputs to others, normally at prices that are discounted as compared with unsubsidised inputs. Such markets may arise with targeted and rationed subsidies, as subsidy recipients sell subsidised inputs to others as a result of differences in access to and needs for working capital (with poorer, capital constrained farmers selling inputs to less poor farmers) and/or differences in perceived marginal benefits to input use (with farmers with more land, for example, requiring larger quantities of inputs and looking for discounted prices).

It is often argued that secondary markets should not be impeded because (a) farmers generally know what is best for them and (b) attempts to limit secondary markets generally lead to (poorer) sellers of inputs into these markets getting lower prices while (less poor) buyers and middlemen get higher prices – with regressive distributional effects as less poor buyers and middlemen capture a large share of subsidy benefits. Such arguments lead on to a related question that is often raised with regard to input subsidies: would it not be better to give poor producers cash rather than an input subsidy and let them choose what to do with the money? This is an important question as social protection and welfare policy make increasing use of cash transfers which avoid the significant inefficiencies and leakages common in subsidy administration and secondary markets.

²²Prices with the rationed subsidy are for simple exposition shown as P'_m and P'_x but in fact would not be expected to fall as much as with a full, unrationed subsidy and should be between P_m and P'_m and between P_x and P'_x respectively.

These are important considerations. There are, however, other significant arguments that suggest that secondary markets can fundamentally undermine input subsidy programmes' wider benefits. At the heart of both conventional and more recent arguments for input subsidies are information and market failures and externalities, all of which cause individually optimising farmers to make decisions that are sub-optimal or inefficient in meeting the goals of wider society. A well designed and effectively implemented input subsidy programme can address four interacting sets of information and market failure and externality problems together:

- Farmers' under-valuation of the benefits of input use to themselves as individuals and to society, as a result of inadequate information on the effects of inputs when properly used and on efficient ways to use them – an information failure considered in sections 9.1 and 9.2.3.1;
- Poorer farmers inability to obtain seasonal working and consumption capital, or ability to obtain it only at much higher cost than the social opportunity cost of such capital – a credit market failure considered in section 9.2.3.2;
- Farmers not benefiting directly from economies of scale when increased input volumes reduce input supply costs and margins - a non-market externality that arises from increasing returns to scale, considered in section 9.2.3.5; and
- Farmers not benefiting directly from lower output prices and consequent dynamic pro-poor growth effects of subsidies which raise staple food production and productivity – a 'market externality'.

If cash transfers replace input subsidies, or secondary markets are encouraged, then welfare transfers can be delivered more efficiently to subsidy beneficiaries (subsidy recipients and/or staple food consumers) but cash transfers are unlikely to be able to address as efficiently at least three of the four information and market failure and externality problems described above²³. This is because allowing people more unconstrained market choices cannot address those externality and information and market failure problems which arise precisely because private and social interests are misaligned. Policy choices between cash transfers and input subsidies with or without constraints on secondary market operation therefore need to take account of specific policy objectives; of the nature of the informational, market, externality and distributional problems that need to be addressed; and of alternative instruments and combinations of complementary instruments that may be used.

This discussion of the role of subsidies in addressing information and market failures and externalities has important implications not only for thinking and policies

²³One would expect cash transfers to address seasonal credit market failures, but Gregory (2006) and Dorward (2006) suggest that this may not be the case as input subsidies may help with 'enforced savings' as money savings are too fungible.

on secondary markets but also on farmer choice within subsidy programmes. It is sometimes argued that voucher systems can and should be used to extend farmer choice, with fixed value vouchers being redeemable for different inputs which farmers may choose between. This empowers farmers, and allows them to use the subsidy to invest in inputs that they consider will make the largest contribution to their livelihoods. The effectiveness with which subsidies address information and market failures and externalities may, however, require some restrictions on farmer choice, to ensure that their choices align with wider social efficiency objectives.

9.2.3.9 Entitlement and distribution systems

Any targeting or rationing system requires a method for restricting access to subsidised inputs. This requires a list or specification of entitled beneficiaries with specification of their subsidised input entitlement and then a mechanism that allows them to access that entitlement. This mechanism may involve either physical distribution of inputs from a specified distribution point against a list of entitled beneficiaries held at that distribution point, with some form of secure identification, or separate distribution of evidence of entitlement which can then be 'redeemed' by the beneficiary at authorised input retail outlets. Evidence of entitlement is most commonly a paper voucher, but scratch cards and electronic systems involving bank cards, electronic 'smart' cards and mobile phones may also be used. Since entitlements have considerable financial value, vouchers or cards need to be very secure as regards prevention of counterfeit fraud (with secure printing processes and print features and/or real time, secure and centralised monitoring of allocated and redeemed entitlements). Different systems offer different potential benefits but pose different political, technical, administrative and social challenges within communities and households (the use of biometric information, for example, raises questions about intra-household control over input subsidy entitlements; electronic systems must be able to operate in areas with no electricity, and some require reliable mobile phone network access and expensive equipment).

Entitlements may be input specific (entitling the beneficiary to a particular quantity of a particular input on payment of a top up) or flexible (entitling the beneficiary to choose between a limited range of specified inputs on payment of a top up). They may also be fixed value (with the top up varying when used in different locations or outlets or, with flexible vouchers, when used for different inputs) or be associated with a fixed top up (where the top up paid by the beneficiary is constant but the value of the subsidy varies, when redeemed by the retail outlet). Flexible vouchers are normally also fixed value vouchers. There are important interactions between types of vouchers, secondary markets, recipient choice (of inputs and suppliers), control of fraud and of programme costs, and gendered access to and control of subsidised inputs within households.

9.2.3.10 Complementary integration, investments and policies

Positive impacts from input subsidies are determined by the on-farm physical productivity of inputs; by input supply system efficiency, transport and communication systems and costs; and by output market efficiency (as these affect marginal value products of input use, output supply curves and shifts, and output demand curves and elasticities) – as well as by the effectiveness and efficiency of implementation of the subsidy programme itself. Programme impacts can therefore often be enhanced by complementary investments in agricultural research and extension that can raise input productivity; by subsidies for complementary inputs (for example seeds and fertilisers); and by investments in road, communications, and market infrastructure and service development. Programme effectiveness and efficiency can also be improved by designing and implementing subsidy and other policy instruments in ways that are complementary (for example cash transfer or cash for work programmes may be linked to subsidy entitlement systems to facilitate participation by and benefit for very poor producers, or subsidy entitlements may be linked to and incentivise investments in soil and water conservation). Complementary development of staple food markets is an area of complementary policy that is particularly important given the way that major subsidy benefits involve consumers' accessing food at lower prices.

9.2.3.11 Soil fertility replenishment

As noted earlier, one of the reasons put forward for fertiliser subsidies is the need to combat the alarming decline in soil nutrients in many parts of Africa and the need for (and benefits of) their replenishment. Crawford et al 2006 summarise soil fertility problems in terms of declining fallows, rapid deforestation, land degradation, and declining nitrogen, phosphate and potassium levels in arable soils. Subsidies to promote the application of fertilisers may then be justified in terms of externalities from increasing fertiliser application where fertiliser use, higher soil fertility and higher farm yields provide a number of benefits to society rather than to individual farmers: reductions in soil erosion and downstream flooding and siltation, in deforestation and CO₂ emissions, and in soil and wider ecosystem and biodiversity loss as a result of reduced pressures to cultivate marginal and fragile land; and reductions in poverty and in rural-urban migration, and hence in wider social costs of addressing rural and urban poverty as a result of increased farm and rural incomes (Sánchez et al., 1997). It may also be argued that poverty and food insecurity cause many African farmers to place a higher value on short term income and food production and a lower value on longer term investments in soil fertility and other types of natural capital (as compared with their value to wider society), again leading to under investment in soil fertility and a justification for subsidies to promote investments in better soil management.

9.2.3.12 Political economy issues

Another important set of issues affecting the implementation and outcomes of input subsidy programmes concern domestic and international political contexts and processes. These are given increasing recognition in agricultural development policy analysis (see for example Birner and Resnick, 2005; Cabral and Scoones, 2006; World Bank, 2007) but detailed analyses of study of policy processes in input subsidy programmes are less common (Chinsinga, 2006, and Dorward et al, 2008 are exceptions). Political processes are, however, extremely important for input subsidy programmes.

Large scale input subsidy programmes are extremely costly, they represent very significant transfers to subsidy recipients, and they offer opportunities for very substantial captures of rents by a variety of stakeholders (politicians, programme administrators, input suppliers, traders, and less poor farmers).

As a result, political economy difficulties with large scale input subsidies are found in almost all countries where subsidies are implemented. Thus in OECD countries agricultural subsidies (not specifically input subsidies) are widely recognised to be inefficient but have continued because they serve particular political interests. Input subsidies (fertiliser and electricity for example) persist for similar reasons in many Asian countries after they have served their role of kick starting rural growth, despite being extremely costly.

Political economy difficulties can, however, be particularly problematic in poorer rural economies where (a) there are very substantial economic opportunity costs from the diversion of scarce fiscal resources to input subsidies and away from other productive investments (such as agricultural research or infrastructural development) and (b) potential personal and political gains from subsidy rents are very large relative to other income, patronage and rent seeking opportunities in the economy. A paradox arises in that while substantial political commitment is needed for large scale input subsidies to be implemented, the political objectives behind such commitment will often focus around or be shifted towards short term patronage opportunities. Unfortunately, however, pursuit of these opportunities tends to undermine the economic efficiency and wider pro-poor growth benefits of input subsidies - by directing subsidies to less poor recipients with more political voice, directing subsidies towards cash crops, undermining competition and efficiency in input delivery systems, and increasing leakages and non-transparent secondary markets. These difficulties are particularly prevalent in political systems with significant neo-patrimonial elements, as is common in many poorer rural economies, particularly in Africa (van de Walle, 1999).

A second paradox related to political economy also arises with regard to the importance of stable, continuing and longer term subsidies if they are to lead

to supply system development and wider dynamic changes in rural economies (as discussed earlier in sections 9.2.3.5 and 9.2.3.6). While this carries important benefits it also carries important risks, as if subsidies are not set up with clear time limits and if they continue for long periods then already substantial risks of their being politically entrenched and ‘hijacked’ are increased. Similarly the longer subsidies are in place and the more stable the subsidy systems, the greater the opportunities for those wishing to perpetrate fraud and divert subsidies to find ways of doing so. There is therefore a substantial challenge in finding ways of promoting stability and trust for farmers and input suppliers while at the same time specifying clear exit mechanisms and rules (to reduce risks of political capture) and varying systems (to reduce fraud).

Understanding and addressing political economy issues in agricultural input subsidies is a difficult but very important issue. A key part of this is understanding the diverse legitimate and illegitimate interests and powers of different stakeholders (for example farmers with different livelihoods; produce buyers, sellers and consumers; tax payers; local and national politicians; technicians; donors; input supply businesses and employees; civil society; government and private organisations and their managers, traditional leaders), as they relate to personal, local, organisational and wider political, financial, economic and symbolic²⁴ constraints and objectives.

9.2.4 Rethinking input subsidies: conclusions and conceptual frameworks

The review in previous sections of new thinking and its implications allows us to identify new insights about the potential pitfalls and practice of smart subsidies and to draw out first the key elements of input subsidy programmes and second the major impacts that they may have. This then defines issues to be considered in evaluating them.

9.2.4.1 Key elements of input subsidy programmes

The ‘success’ of an input subsidy programme has to be judged against the objectives of that programme. Input subsidy programmes can and do have a wide range of different possible objectives as set out in table 9.3.

Most of these objectives are mutually complementary. However our analysis suggests that objective (1) in table 9.3 (a contribution to wider, pro-poor, economic growth) should normally be important and using the terminology of Dorward (2009)

²⁴Symbolic’ constraints and opportunities are those that while not apparently technocratically rational are pursued because they have significant symbolic importance. Examples include national food self-sufficiency – this may or may not be an economically efficient way of ensuring national food security, but in some countries it has significant symbolic political importance. Avoiding of weakness or devaluation of national currency is another example of a symbolic objective in some countries.

this will be supported by contributions to ‘hanging in’ from improved national and household food security (objective 3 in table 9.3); by contributions to ‘stepping up’ from increased input adoption, efficiency in use, attention to the price productivity tightrope, improved producer welfare, and input supply system development (4 to 8); by contributions to ‘stepping out’ from attention to the price productivity tightrope, improved producer welfare, and input supply system development (6 to 8); and by contributions to all three of these transformations from soil fertility replenishment and from political benefits that support commitment of resources to effective and efficient subsidy implementation (10 and 11). However some objectives in table 9.3 may also be to a greater or lesser extent mutually incompatible (for example 2 and 7 may in some cases be incompatible, and pursuit of 9 is generally incompatible with many of the other objectives – although some rents may be necessary for political economy purposes to allow a subsidy to be implemented). It is also important to note that stated formal programme objectives may differ from the objectives of individual stakeholders.

TABLE 9.3
Possible input subsidy programme objectives

1	Wider (pro-poor) economic growth
2	Consumer benefits - lower output prices, access (emphasis on poorer consumers?)
3	National / household food self sufficiency / security
4	Input adoption
5	Input use efficiency
6	Addressing the price productivity tightrope
7	Producer welfare (emphasis on poorer producers?)
8	Input supply system development & efficiency
9	Rents (supplier, producer, administrative, political)
10	Soil fertility replenishment
11	Political benefits (personal, party, etc)

Note: These objectives are not arranged in any order of priority or importance

Given that the identification and prioritisation of objectives will be different in different situations, the balance of programme objectives should then determine the key design and implementation elements of input subsidy programmes. These are summarised in Table 9.4.

These elements have all been discussed explicitly or implicitly in earlier sections, which have suggested that input subsidies will generally (but not always) yield the greatest returns where they focus on consumer benefits and on indirect gains to pro-poor economic growth from increased food staple productivity, where they operate at a large enough scale (in terms of the number of beneficiaries, the subsidy per beneficiary and the total subsidised volumes) to lower staple produce prices - but with rationing and targeting criteria and methods which direct subsidised inputs

to producers whose productive input use is constrained by market failures which can be overcome or substantially reduced through the subsidy. Such rationing and targeting will normally be best achieved by various forms of voucher systems which enable cost effective and timely input distribution, which support sustainable unsubsidised (commercial) input supply system development, and which limit secondary market development and leakages. Effective implementation of these various elements will normally require coordinated complementary investments and policies supporting infrastructural development, agricultural research and development, and efficient output markets offering lower and more stable staple prices to consumers.

TABLE 9.4
Key design and implementation elements of input subsidy programmes

1	Basic subsidy system (focus on consumer or producer benefits, direct recipients)
2	Product focus – staple foods, cash crops, etc
3	Scale – beneficiary coverage
4	Subsidy per beneficiary
5	Total volumes subsidised
6	Voucher or other entitlement systems, distribution and input access systems and timing
7	Rationing – objectives, methods
8	Targeting (if rationing) – objectives, criteria and methods
9	Input supply systems (involvement of parastatal and /or private wholesale and retail suppliers) and timing
10	Secondary market and leakage policies (and enforcement mechanisms)
11	Complementary integration and investments and policies

However as should also be clear from these sections, these elements are also highly inter-related, with many synergies and trade-offs. These interactions are most easily identified around the themes of scale and scope: large scale subsidy programmes offer wider supply side benefits (in input supply system development, in consumer and dynamic pro-poor growth impacts) but make effective, timely and efficient programme management more difficult and can crowd out complementary investments needed for higher productivity of input use. Different entitlement, targeting and rationing systems are effectively attempts to control the scale of subsidy programmes by directing limited resources to their most productive uses – but these are themselves often difficult and costly to implement. Indeed there is something of a paradox here, that it is in the application of targeted subsidies to input use on staple foods in poor rural areas that such subsidies both offer the greatest potential benefits and pose the greatest implementation, resourcing and coordination challenges (Dorward et al, 2009).

TABLE 9.5
Potential outcomes of input subsidy programmes

1	Timing
2	Performance monitoring and audit systems
3	Input leakage, displacement
4	Incremental input use
5	Incremental production
6	Increased productivity
7	Output price changes (producer and consumer prices)
8	Input price changes
9	Labour market changes (hired labour demand, wages)
10	Programme cost / benefit analysis (fiscal, economic)
11	Welfare and growth impacts
12	Macroeconomic effects
13	Input supply system impacts
14	Soil fertility replenishment

7.3 Recent experience with input subsidies

Having considered key features of input subsidy programmes (their potential impacts, objectives and features) we now turn to examine recent experience with their implementation. As noted earlier, there has been resurgent interest in input subsidies, in particular ‘smart subsidies’ for fertilisers in Africa. High food and fertiliser prices in the first part of 2008 added to this, with many reports of new or expanding subsidy programmes in different countries around the world. IFDC, towards the end of 2008, reported new, expanding or continuing subsidy programmes in China, India, Philippines, Sri Lanka, Indonesia, Ghana, Nigeria and Malawi (<http://www.ifdc.org/focusonfertilizer8.html>). Other countries for which there are reports of new or expanded fertiliser subsidy programmes include Tanzania, Kenya, Rwanda, Mali, Senegal, and Bangladesh. Unfortunately there are very few detailed and rigorous evaluations of most of these programmes – indeed it is often difficult to find even very basic information about them: ‘recent experience with input subsidies’ is difficult to review. This lack of information is not surprising – given the ongoing emergence of many of these programmes and national rather than donor ownership.

We therefore summarise observations from an examination of 10 fertiliser subsidy programmes in Africa, all except one of these implemented since the turn of the century. These have been selected on the basis of (a) availability of information and (b) representation of a range of different approaches to and types of subsidy

programme²⁵. Table 9.6 lists the 10 programmes and summarises the information available on each against key issues identified earlier in tables 9.4, 9.4 and 9.5. Before considering the insights from this table and what it can teach us as regards general patterns of subsidy programme objectives, design, implementation and impacts we first briefly describe each of the programmes considered in table 9.6.

9.3.1 Programme descriptions

9.3.1.1 Ghana

In early 2008 Ghana faced high food prices and rising fertiliser prices and the government and large fertiliser importers (who had significant but high priced fertiliser stocks) discussed the potential and possible modalities for a national fertiliser subsidy programme. Press reports (Ghana News Agency 9th June 2008, 3rd July 2008) indicate that the programme was formally announced in June 2008 and operated from July to December. A total of 30,000 tonnes of four types of fertiliser was made available by three major importers, with pan territorial farmer prices representing an approximate 50% subsidy, at a total cost of around US\$15 million²⁶. Large numbers of vouchers (over 1 million) were printed against planned subsidy sales of 600,000 bags. Deliveries were late for the cropping season in the south of the country (April to July), but were more timely for the north, and this may account for lower uptake and fertiliser sales in the south and use on a wider range of minor crops as compared with the north where there was more substantial uptake and use mainly on maize.

Vouchers were distributed by Ministry of Agriculture staff, with wide variation in approaches, systems and numbers across different areas, and limited information to field level staff on the total number of vouchers that they would receive for distribution. Redemption prices varied geographically to provide pan-territorial farmer prices in district capitals, but this tended to discourage suppliers from supplying fertilisers outside district capitals as neither redemption nor farmer prices covered costs of transport outside district capitals. No subsidy sales were made by (smaller) distributors independent of the major fertiliser importers (indeed in the north unsubsidised sales were reported to be banned completely).

Information on the Ghana 2008 fertiliser is obtained largely from Banful (2008).

²⁵A very large number of programmes and projects could be considered as providing some form of 'input subsidy' if this is interpreted in its widest sense as some form of public investment promoting input use, as, for example, agricultural research and extension, agrodealer development, market development and rural road building are all forms of public investment that may be intended to directly or indirectly promote agricultural input use. The programmes considered are restricted to those that provide some direct subsidy to input supply operations (beyond input supply system development, although they may – and hopefully will – contribute to input supply system development as well)

²⁶Total budgeted subsidy cost was \$25 million but only about \$15 million was directly for the subsidy inputs and voucher costs (pers. comm., Afua Branoah Banful)

9.3.1.2 Zambia fertilizer support programme (FSP)

Zambia has been implementing fertiliser subsidies for a long period, but the current programme was initiated in 2002, and disburses an average of over 66,000mt of subsidised fertiliser per year. This is imported by private companies under government tender and then distributed to farmers through cooperative societies (Xu et al, 2008). There is anecdotal, press and survey evidence that substantial quantities of subsidised fertilisers are diverted from cooperatives and smallholder farmers to fertiliser traders, who then sell it at unsubsidised prices. The subsidised fertiliser that does reach smallholder farmers tends to go to less poor farmers (who, on efficiency grounds, are explicitly targeted by the programme) and may lead to substantial displacement (Minde et al, 2008). Nevertheless the programme is estimated to yield an economic cost benefit ratio that is greater than 1, though this is lower than might be achieved by alternative investments in longer term research or infrastructural programmes (Jayne et al, 2007). There has been substantial political controversy regarding the implementation of the 2008/9 programme.

9.3.1.3 Kenya national accelerated agricultural input programme (NAAIP)

In 2007 the Kenya government decided to embark upon a National Accelerated Agricultural Input Programme to promote food security, agricultural input use, input market development, and agricultural productivity. Initially planned to subsidise fertilisers and maize seed for a limited number of districts, it has subsequently been expanded to national coverage with plans to provide 2.5 million farmers with maize seed and fertilisers for 0.4 ha each, with vouchers issued to targeted farmers (disadvantaged households with land) and subsequent redemption through private input sellers who would also be eligible for trade credit guarantees. Farmers will also benefit from linked extension, cereal banks, warehouse receipts, and participation in farmer groups (Sikobe, 2008). It has not been possible to access information on outcomes from the programme, but the programme is included in our review as an example of large scale programme design and implementation aspirations.

9.3.1.4 Malawi agricultural input subsidy programme (AISP), targeted input programme (TIP) and starter pack programme (SP)

Malawi has implemented a series of different national input subsidy programmes over the last 10 years, which have been supported by extensive monitoring and evaluation activities and have attracted considerable international interest.

In the 1998/99 and 1999/2000 agricultural seasons the Malawi Government, with donor support, implemented a large scale programme under which all farm households in Malawi received an input 'starter pack' comprising 15 kg of fertiliser, 2 kg of maize seed and some legume seed. With good rains, Malawi had large harvests these years. From 2000/2001 the programme was scaled down to the