

TABLE 8.1
Summary of ILO grass root-based insurance cases

Country	Name	Risk covered	Supplier	Government role	Remarks	Author (s)
Bangladesh	BRAC, GRAMEEN KALYAN, SSS	health, targeting rural poor	own network	donor-funded	potential costumers reluctant to pay premiums; no professional management; development people success depends upon performance of microfinance; still in initial stage	U Ahmed et al. (2005)
Benin	Association d'Entraide des Femmes, or Women's Self-help Association (ASSEF)	health, microfinance loan protection	microfinance arm of AsSEF	support from ILO-STEP programme		Louis (2006)
Colombia	LA EQUIDAD SEGUROS	life; loan protection	microcredit institutions, acting as agents	none	good business	Almeida and de Paula Jaramillo (2005)
Guatemala	COLUMNA	life	Credit unions	none		Herrera and Miranda (2004)
Guinea	Union des Mutuelles de Santé de Guinée Forestière (UMSGF)	health;	association of Mutual Organization	none	Support from International Centre for Development and Research (CIDR) as part of regional initiative; financially unsustainable	Gautier et al. (2005)
India	TATA-AIG		first tried through microfinance; then own network of micro-agents	none	scheme is recent; results still to be assessed	Roth and Athreya (2005)
India	microfinance: SPANDANA, SHEPHERD, ASA	SPANDANA; only life; SHEPHERD: life, health, assets; ASA: in between	microcredit perspective:	none	trade-off: many customer with few mandatory products, or few with complex voluntary; price matters!	Roth et al. (2005)

TABLE 8.1
Summary of ILO grass root-based insurance cases (continued)

Country	Name	Risk covered	Supplier	Government role	Remarks	Author (s)
India	VimoSEWA	multirisk	NGO SEWA: women's group in Gujarat initially selling public insurance; begun own products to cope with inefficiencies	public insurances subsidized; GTZ supplying technical assistance	difficulties; need more assistance	Garand (2005)
India	KARUNA TRUST	health, drugs, hospitalization, wage and income losses	NGO piloting health insurance on behalf of National Insurance Company (NIC) in Karnataka	NIC is public; support from UNDP; subsidized premiums	decided to subsidize for the poor, to familiarize and create complementarities in view of financial sustainability; reported frauds	Radermacher et al. (2005a)
India	YESHAVINI COOPERATIVE FARMERS' HEALTH	Surgery in rural areas of Karnataka	own network	subsidized by the government	high premiums for high cost/low frequency events; lack of transparency and client orientation	Radermacher et al (2005b)
Malawi	MUSCCO	loan protection; life	Microcredit co-operatives initiated by the Catholic Church (SACCO)	none	highly decentralized delivery and control system	Enarsson and Wirén (2005)
Peru	SERVIPERU'	funeral, health care	SEGUROSCOOP, then SERVIPERU' own network	none	not tied to credit	Rodriguez and Miranda (2004)
Philippines	CARD-MBA	life, and later disability pensions	microcredit NGO, then independent	none	Both CUs and their members as costumers	McCord and Buczkowski (2004)
Poland	TUW SKOK	loan protection; later property and personal	Credit Union	none	decentralized managerial structure, with incentives for sales agents	Churchill and Pepler (2004)

TABLE 8.1
Summary of ILO grass root-based insurance cases (continued)

Country	Name	Risk covered	Supplier	Government role	Remarks	Author (s)
Sri Lanka	ALMAO	disability, hospitalization, death and maturity	Sanasa movement and credit cooperatives	none	democracy is needed for operating on a mutual basis; need public/donor support at the beginning	Enarsson and Wirén (2006)
Sri Lanka	YAMSU	disability, hospitalization, death	INGO All Ceylon development Council, re-insured by Rabobank	none	democracy is needed for mutual basis; need public/donor support at the beginning	Enarsson and Wirén (2006)
Uganda	AIG Uganda – GPA	personal accidents	microfinance institution (FINCA)	none	good business; could be expanded	McCord et al (2005)
Uganda Zambia Malawi Philippines Mexico	OPPORTUNITY INTERNATIONAL with 5 companies	mostly loan protection to microfinance institutions; some funeral (similar)	microfinance institutions	none	keep it simple and offer incentive to the microfinance institutions	Leftley (2005)
Viet Nam	TYM's Mutual Assistance Fund	life, some illness	microcredit institution	none	fixed benefits and premiums	Tran and Yun (2004)
Zambia	MADISON INSURANCE	loan protection to microcredit, funerals	MADISON treats microfinance institutions as policyholders under a collective contract, for a commission or profit sharing	none	customers don't like the idea that insurance is mandatory to get credit	Manje (2005)

in 17 of the 24 total cases reported. Insurance policies were started as a by-product of the operation of micro-credit, with the objective of protecting loans against risks of default arising from health problems or death of the members. Members were initially proposed to apply a surcharge on their loan repayments, to covering possible default risks. From this narrow base, the same organizations began differentiating policies and proposing coverage for a wider spectrum of risks. Coverage for loan protection and health was offered by microfinance institutions at very low cost, which also contributed to making them affordable.

This evidence is consistent with the observation, made in the previous section, that the availability of services which allow small losses – primarily credit – to be retained is an important catalyst for the development of insurance. From the ILO case studies, this may even appear as a necessary condition. In many of the case studies, grassroots microfinance institutions provided the basis for demonstrating the usefulness and the functioning of insurance, as well as the necessary trust among parties involved. In most cases this happened within non-governmental organizations, some of which bear a confessional or other group identity. This facilitated the building of a sense of ownership, increased mutual control across members, and ultimately lowered start-up and transaction costs.

8.3 Concluding remarks

The review provided in this paper indicates that very few agricultural insurance schemes work on a purely market basis. Even the more innovative schemes operate with support from the public sector or donors. This is the case in countries where agriculture enjoys extensive support, such as the USA and countries in the EU. Here, intervention seems to address the need for re-insurance, cognitive failures and other possible market failures, but also to stimulate a demand that may be crowded out by subsidies which reduce risk.

Support to agricultural insurance is also widespread in developing countries, where farmers are generally less protected. Foreign aid resources are employed to finance agricultural insurance schemes in many cases, and there is evidence that such resources have been crucial in shaping the fortune, or misfortune, of some schemes.

Compared to the indications provided by risk layering, governments seem to intervene beyond what would be expected. Subsidization of premiums and financial support to the operation of private companies or parastatals is widespread in many countries, beyond the correction of market failures generated by catastrophic risks, and the provision of regulations, information and the need to lower transaction costs.

Interventions seem to be mostly dictated by equity consideration. But the more direct types of intervention, such as premium subsidization, are in fact often associated with reports of inefficiency, lack of financial sustainability and poor **targeting. Premium subsidization, in other words, does not seem to result in an advantage for poorer farmers, while it seems to be crowding out market-based insurances.**

At the same time, it should also be noted that the relation between the extent of public involvement and the functioning of insurance is not straightforward. More or less successful outcomes can be found among insurance schemes having different forms and degrees of public intervention and partnership with the private sector; and to some extent even within different types of insurance, from the more traditional to the more innovative index based ones. Market incentives seem to work effectively for small farmers in Mongolia and Malawi, where interventions adhered to the principle of risk layering. However, this was not the case in Morocco or India. A directly publicly funded scheme such as the MSIF in Mauritius is reported to function effectively, without undermining incentives or running into financial problems, on the basis of a sound incentive structure. This indicates that the specific incentive structure which prevails in the organization of agricultural insurance, as well as the more general agricultural economic environment, can be very important in determining outcomes; perhaps as important as the extent of public support *per se*.

Looking outside agriculture, the case studies conducted by the ILO indicate that entirely private insurance in poor and remote rural areas can emerge when pre-existing organizations support start-up costs, and where the potential buyers of insurance have access to basic services such as credit. Where this is not the case, there may be scope for governments or donors to intervene and support the start-up costs.

The review also shows that, despite being classified as least distortionary and WTO-compatible measures, support to insurance is far from being a panacea, or a way to reduce governments' involvement and delegate functions to the private sector. Insurance is just one element of a wider risk management strategy, which can contribute to remove obstacles to agricultural investment. Hence the promotion of a market for agricultural insurance should be consistent with a broader effort to enhance farmers' ability to access services, and the functioning of the relative markets.

To conclude, given the extent of intervention in the agricultural insurance market, it is worth using the evidence summarized in the previous sections to discuss how to prevent some of the undesirable outcomes observed. Two main points can be made in this respect. Firstly, as a rule of the thumb, actions aimed at facilitating the spontaneous emergence of a market or protecting the financial sustainability of an

insurance scheme should be preferred over the direct subsidization of premiums. Based on the experiences reviewed, it seems that the former is more likely to leave room for the emergence of market incentives, on both the demand and supply sides. Secondly, any form of public support to agricultural insurance may be framed and organized on a temporary basis, with some “graduation” system which can reduce government involvement. This may prevent the constitution of rents, both in agriculture and in the insurance industry.

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Rethinking agricultural input subsidy programmes in developing countries

Andrew Dorward¹

Introduction

Recent years have seen a resurgent interest in large scale input subsidies, and particularly fertilizer subsidies, in agricultural development and food security policies in Africa. Very high global grain prices in the first part of 2008 appeared to make such subsidies even more attractive, but this was complicated by even more dramatic rises in fertilizer prices. While global grain and fertiliser prices have subsequently fallen back, high grain prices have persisted in many domestic markets, and future food and fertiliser prices are very uncertain.

This paper considers the roles of input subsidy programmes in poor rural economies in Africa in these difficult times. The paper begins with a brief review of historical changes in experience with and views of input subsidies, and of the factors behind resurgent interest in input subsidy programmes, particularly with a new generation of so called 'smart subsidies'. We then consider how the features of smart subsidies may demand a rethinking of economic analysis of the benefits of subsidies in different contexts. This provides the foundation for a conceptual framework for considering the key issues affecting the performance of subsidy programmes. This framework is then applied to discussion of recent experience of specific input subsidy programmes.

The final part of the paper considers how current grain and fertiliser prices, and uncertainty regarding future prices, impacts on subsidy programmes, and asks what

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roles input subsidy programmes may have under different price regimes in different contexts in the future, and what critical factors will determine their performance.

9.1 'Conventional' input subsidies in agricultural development - theory and practice

Large scale (so called universal) agricultural input subsidies were a common and major feature of agricultural development policies in poor rural economies from the 1960s to the 1980s. They were generally implemented as 'across the board' price subsidies accessible to all producers, or to all producers of a particular category. If they were sold through a state monopsony then there were commonly attempts at price discrimination, with, for example, only smallholder farmers allowed to purchase subsidised fertiliser and forbidden from selling it on². Fertiliser subsidies were particularly expensive and made heavy and growing demands on government budgets as they stimulated increased fertiliser consumption (and hence increased volumes of fertiliser subsidy) while political pressures also led to pressures for the subsidy rate to increase, or at least not contract, in the face of growing fertiliser prices. For discussion of fertiliser subsidies in Asia see Fan et al 2007, Timmer 2004, Morris et al, 2007; Ellis 1992.

Conventional arguments for subsidies in agricultural development have focussed on the promotion of increased agricultural productivity through the adoption of new technologies (Ellis, 1992). Reduced costs of subsidised inputs increase their profitability and reduce risks perceived by farmers in adopting them in circumstances where farmers' limited knowledge first of input benefits and second of their correct usage inappropriately constrain their expenditure on input use. Together with credit and extension services, input subsidies were supposed to help farmers implement, benefit from and then, with the withdrawal of the subsidy, themselves fully fund economically and technically efficient input purchases and use: rapid learning with subsidies about input use and its benefits should mean that subsidies would be needed for only a short time and could be rapidly phased out. However subsidies were often subsequently implemented more widely with pan territorial pricing to support agricultural development in more remote areas, and to counteract taxes on agriculture through export tariffs, managed exchange rates and controls on domestic prices.

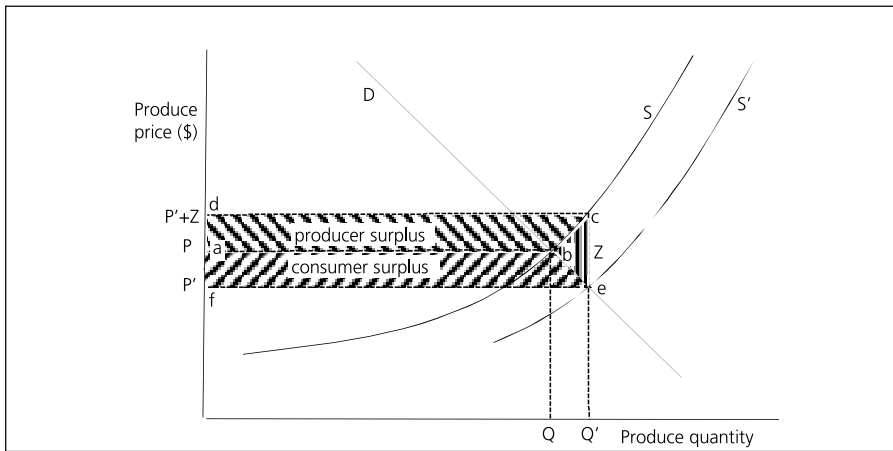
Economic analysis of price subsidies considers the costs and benefits of subsidies in shifting farmers' supply curves for agricultural produce (see figure 9.1). If there are no market failures then a subsidy of \$Z per unit output increases effective producer price above the market price by \$Z³, causing a downward shift in the market price

² We will discuss 'leakage' from subsidy sales later.

³ If the subsidy is addressing a market failure then a subsidy of \$Z per unit output will increase effective producer price above the market price by more than \$Z (say \$Z')

supply curve (S to S' in figure 9.1) and this leads to an expansion in supply (from Q to Q') and a fall in market or consumer price of the product (from P to P' in figure 9.1, assuming that the good is a non-tradable with a downward sloping demand curve), with an increase in both producer surplus (shown in figure 9.1 by the shaded area $abcd$) and consumer surplus (shown by the shaded area $abe'f'$). The total cost of the subsidy is the total subsidy paid (new equilibrium quantity multiplied by the per unit subsidy, $Q'.Z$, shown by the shaded area $dcef$) plus administration costs. The total subsidy paid is greater than the sum of the increased consumer and producer welfare by a deadweight loss shown in figure 9.1 by the triangle bce (Siamwalla and Valdes, 1986). Under such circumstances, and even without allowing for administration costs, the subsidy would therefore lead to a net economic loss to the country and an income transfer from taxpayers to consumers and producers.

FIGURE 7.1
Input subsidy impacts on output supply, price and stakeholder welfare



Three related points emerge from this analysis.

First, a subsidy can only generate a positive net economic return to a country if there is some market failure which means that the downward shift in the supply curve is greater than the cost of subsidising production, including the costs of subsidy administration (that is Z , the per unit cost of the subsidy to the government, is less than Z' , the effective increase in output price – or reduction in per unit costs – received by producers). This may occur where farmers' perceived private cost of inputs is higher than the true social or economic cost, and/or the farmers'

⁴ The net gain in producer surplus can also be represented as the total increase in producer surplus represented by the area between the supply curves S and S' below price P' less the loss in producer surplus as the result of the price fall from P to P' , represented by the area between P and P' and to the left of curve S .

perceptions of private benefits from increased input use are lower than the actual social or economic benefits⁵. Such situations can arise where (a) farmers' private costs of working capital for input purchase are greater than the social cost of capital, (b) farmers' lack of knowledge about the benefits of inputs means that their expectation of the production benefits from input use are less than the benefits that they will gain, (c) there are learning costs with input use such that initial farmer returns are low but these will increase with experience (see for example Ellis, 1992; Crawford et al, 2006; Morris et al, 2007)⁶, and (d) farmers' risk assessment and aversion in investing working capital in input purchase and use is higher than society's risk assessment and aversion. These divergences between farmers' and society's perceptions should decline as farmers gain experience with input use, with increasing knowledge of the benefits and risks of input use, increasing knowledge of how to use inputs, and consequent increasing efficiency in their use.

Second, the size of the deadweight loss and the distribution of benefits between consumers and producers depend upon the elasticities of supply and demand as shown in table 9.1 (see appendix 1 for diagrams). This is important as (a) larger deadweight losses are associated with increasing inefficiencies, and (b) the distribution of income transfers between producers and consumers has equity and poverty reduction impacts depending upon the relative wealth and incomes of the producers and consumers concerned.

TABLE 9.1
Effects of demand and supply inelasticities on consumer and producer gains and on deadweights

	Perfectly elastic demand	Unitary demand	Perfectly inelastic demand
Perfectly elastic supply, shifts down	N/A	All gains to consumers, Large deadweight	All gains to consumers, No deadweight
Unitary supply, shifts down / to the right	All gains to suppliers Large deadweight	Shared gains, some deadweight	All gains to consumers, No deadweight
Perfectly inelastic supply (may shift to the right)	All gains to suppliers. No deadweight	Gains shared (depending on supply shift), No deadweight	N/A

Elastic demand or supply tends to be associated with larger deadweight losses, and demand or supply inelasticity tends to be associated with smaller deadweight losses. Similarly inelastic demand is associated with larger shares of consumer surplus benefits, while inelastic supply (both price elasticity and with regard to the subsidy) is associated with larger shares of producer surplus benefits. Staple food

⁵ This can be shown using marginal value product and marginal factor cost analysis, see figure 9.2.

⁶ This is effectively an infant industry argument

markets in land locked countries (with large import/export parity price differentials) tend to be associated with more inelastic demand by poor consumers (where prices lie between export and import parity prices). Demand tends to be more elastic for cash crops, and particularly export cash crops. It should also be noted that an implicit feature of this analysis is that it applies only to subsidies implemented on a large enough scale to affect output prices - small scale subsidies that do not significantly affect production and product prices are analytically equivalent to subsidies with highly elastic product demand: subsidy benefits are largely captured by suppliers / producers, and deadweight costs depend upon the elasticity of supply

Third, transfers to producers can be analysed in terms of inefficiencies associated with *economic rents*. Rents arise in three ways. First, if a general input subsidy is intended to deliver an economic gain by stimulating increased input use to increase production, part of the cost of the subsidy goes to reducing the cost of production for produce that would be produced anyway (this is the producer surplus on produce that would be produced anyway without the subsidy). Unless there is some social or economic benefit from transferring income to producers already using fertiliser, then the subsidy is an inefficient way of stimulating increased production and increased productivity, since the producer surplus to accruing to existing fertiliser use is not delivering any economic gain. Second, producer transfers often end up affecting the demand for agricultural land and labour, and bid up the demand for inputs, and hence apparent producer transfers may in fact be passed back to the suppliers of these factors of production as pure economic rents⁷. Third, where subsidised inputs are rationed (as is common), then such rationing leads to opportunities for those controlling subsidised inputs (politicians, government officials, fertiliser suppliers, farmer organisation office bearers, etc), to divert subsidised inputs from their intended beneficiaries for a side payment or to demand payments from beneficiaries in return for provision of subsidised inputs. The important point here is that even if there are net gains from a subsidy (as a result of divergences between farmers' and societies perceptions of costs and benefits from input use), much of the subsidy cost may be a straight transfer from the state (and hence from taxpayers) to producers and suppliers of land, labour and inputs without any economic gain (with the relative shares of transfers depending upon the elasticities of supply and demand).

Another major concern with input subsidies concerns the extent of leakages and diversion of subsidised inputs away from their intended use. In the context of the supply and demand analysis above, this can be considered in three ways – (a) diversion between products, (b) diversion from intended beneficiaries to others within the country, and (c) cross border leakage.

⁷ This is of course not a problem where the providers of land and labour benefiting from this are poor, indeed it can be an important way in which subsidies can promote pro-poor growth.

(a) Farmers are likely to apply inputs to the use from which they expect to get the greatest return. Fertilisers, for example, may be applied to a variety of crops. As we have seen, deadweight losses are reduced and benefits to poor consumers increased where subsidised inputs are used to expand production of products consumed by poor people with inelastic demand (these tend to be food staples). If returns to fertilisers are higher on other crops (for example cash crops) then farmers may apply subsidised fertilisers to cash crops which have much more price elastic demand and which are not consumed by the poor. Even if farmers do initially apply subsidised input to staple foods, with inelastic demand, a large scale subsidy will tend to reduce prices farmers receive for this crop, and this may in turn lead to fertiliser profitability and use switching to more demand elastic tradables – with increases in deadweights losses and reduced benefits for consumers. Switching of inputs between crops or products is not so directly possible for subsidised seeds⁸.

(b) Input subsidies in developing countries have commonly been targeted towards smallholder rather than commercial farmers, with mechanisms directing subsidised inputs away from large scale commercial farms and regulations prohibiting sale of subsidised inputs by recipients. Where a general subsidy is applied it is difficult to channel subsidised inputs to smallholders unless there are a limited number of tightly controlled supply chains, clear ways of identifying intended beneficiaries, and a high degree of discipline and control of private fertiliser transactions. If subsidised inputs are used by larger scale commercial farms this is likely to lead to increased diversion away from staple food crop production to cash crops (as discussed above) and a greater share of transfers to less poor producers. Similar issues arise in subsidy access between richer and poorer smallholders.

(c) Cross border leakages arise when subsidised inputs are sold outside the country at a discount. The value of the discount represents a straight loss from the transfer of resources outside the country, with the loss of any chance of consumer benefits or economic gain from increased input use.

The final point to note from analysis of input subsidies' effects on product supply and demand is that the extent of supply shifts is critical in determining deadweight losses, the distribution of transfers between producers and consumers, and the extent of wider economic gains. The supply shift is itself determined by the technical efficiency of input use – determined by the quality and appropriateness of the inputs to the product they are used on, the timing of their delivery to farmers, the availability of complementary resources (for example seed and fertiliser together), and the technical skill or competence in the use of the inputs (in comparison with the without subsidy situation).

⁸ Although some indirect switching may happen due to wider capital fungibility

The analysis above of product supply and demand impacts of input subsidies shows many of the things that can go wrong to undermine the economic benefits of input subsidies: the very large transfers to producers and consumers (reducing the efficiency of subsidies in achieving economic gains, and leading to dominance of political economy rather than economic considerations in subsidy policy, with tendencies for these transfers to be captured by elites and/or used for political ends⁹); the presence of deadweight costs (in addition to administration costs, which have not been explicitly considered thus far in the discussion); the dangers of diversion and leakage; and difficulties in clearly specifying economic gains, with the tendency for these to diminish over time. More positively, however, the analysis also helps in the identification of features of subsidies that are likely to yield more benefits and to face lesser dangers of things going wrong. This in turn provides insights about where subsidies are most likely to be useful, and about the ways that subsidies should be implemented. It suggests that inputs subsidies should be focussed:

- on those producers who are not using inputs because of market failure,
- on the use of inputs on products where they can induce a substantial supply shift (and this may also require, for example, complementary input supply, extension and output markets infrastructure and services), and
- on stimulating products with inelastic demand and supply (particularly inelastic demand) among poor producers and consumers: staple grain production tends to have these characteristics in poor large or land locked countries with suitable agro-ecological conditions.

It is noteworthy that although input subsidies are directed at producers and at changing production methods and producer behaviour, this analysis emphasises the importance of consumer in addition to (or rather than) producer benefits for maximising both economic and welfare gains from subsidies. Input subsidies should also be implemented in ways that (a) reduce deadweight losses and rents from straight transfers, (b) reduce leakages, and (c) have low administration costs. The analysis also suggests that subsidies may be less efficient instruments if they are primarily aimed at delivering income transfers to producers and remote areas, because of high deadweight and administration costs, generation of rents, and difficulties in developing / delivering complementary services needed for technically and economically efficient use of subsidised inputs. The distributional impacts and multipliers from expenditure on input subsidies therefore also need to be considered against alternative (tax and subsidy or transfer) instruments for changing income distribution and for stimulating growth.

The conclusions from the theoretical analysis above matches (and influenced) the conventional wisdom among most economists and northern policy analysts on

⁹ This is a point made strongly by Bates (1981)

difficulties with input subsidy programmes. This also emphasised difficulties with:

- Controlling costs, both with general subsidies through, for example, fertiliser production or import subsidies and with quotas or targeted subsidies where there tend to be strong political pressures for the expansion of subsidies, and only weak pressures for their control.
- 'Exits': there is strong political resistance to scaling down or termination of subsidies.
- Effectiveness of targeting of input subsidies to particular farmer types, with problems of diversion and leakage noted above both expanding programme cost and reducing efficiency.
- Over use of inputs, or adoption of input intensive rather than more economically efficient labour intensive production methods, as a result of artificially low input prices
- Regressive benefits favouring larger farmers who can afford subsidised inputs (the poorest farmers may not be able to afford inputs even where they are subsidised).
- Market distortions, and particularly parastatal involvement in subsidised input delivery, tending to crowd out and inhibit private sector investment in input supply systems and provide opportunities for corruption, and hence impede sustainable development.

Although agricultural input subsidies have continued to a greater and lesser extent in a number of countries, conventional wisdom and dominant donor thinking in the 80s and 90s was that such subsidies had been ineffective and inefficient policy instruments in Africa and that they had contributed to government over-spending and fiscal and macro-economic problems.

From the mid 1990s, however, this conventional wisdom has increasingly been challenged with a resurgence of interest in agricultural input subsidies in Africa, new thinking about the historical and potential roles in agricultural development, and the complementary emergence of innovative subsidy delivery systems and instruments.

9.2 Rethinking input subsidies

New thinking on input (and particularly fertiliser) subsidies in Africa has arisen for a number of related reasons. The fundamental driver of this has been increased questioning by African politicians, by NGOs and by some policy analysts about the failures of liberalised policies in supporting broad based agricultural development, particularly sustainable intensification of staple food crop production. This has been accompanied by strong political demands for fertiliser subsidies in many countries; tensions among donors in resisting such demands (with increasing legitimacy of

democratic governments in Africa and divergent donor views on subsidy merits); concerns about declining soil fertility, agricultural stagnation and rural poverty in Africa; and identification of input subsidies as a potential instrument for social protection policies. The Abuja conference marked a significant milestone in this.

These concerns have led to interest in the potential for input subsidies to deliver a wider range of (sometimes unstated) objectives than those formerly recognised in the conventional wisdom described earlier. These objectives include, in addition to those considered earlier¹⁰:

- Short term private input market development.
- Replenishment of soil fertility.
- Social protection for poor subsidy recipients.
- National and household food security.
- Meeting broad based political demands.

There has also been considerable interest in the development of new instruments and approaches in designing and delivering input subsidies, as so called 'smart subsidies'. Morris et al. (2007) describe 10 features of smart subsidies: 'promoting fertiliser as part of a wider strategy', 'favouring market based solutions' in input supply, 'promoting competition' in input supply, 'paying attention to demand', 'insisting on economic efficiency', 'empowering farmers', 'involving an exit strategy', 'pursuing regional integration', 'ensuring sustainability', and 'promoting pro-poor economic growth' (op.cit, p103-104). They recognise that 'in exceptional circumstances, poverty reduction or food security objectives may even be given precedence over efficiency and sustainability goals' (op.cit, p104-105). Instruments proposed for implementing smart subsidies include demonstration packs, vouchers, matching grants and loan guarantees. For all of these the details of instrument design and implementation are critical to their success. These instruments and design and implementation issues will be returned to later.

The interest in getting input subsidies to serve new functions and objectives, and the extent to which input subsidies are the most cost effective way of achieving these objectives continues to be controversial. The main text of the 2008 World Development Report on "Agriculture for Development", for example, recognises all the features of smart subsidies outlined above, but its summarised position is more restricted and conventional, focusing on subsidy roles as being to provide "sustainable solutions to market failures, ...through ... 'market smart' approaches to jumpstarting agricultural input markets...., and underwriting risks of early adoption of new technologies to help achieve economies of scale ... to reduce input prices ...as part of a comprehensive strategy to improve productivity with credible exit options" (World Bank, 2008).

¹⁰Morris et al. (2007)

It is, however, possible to question how important some of these objectives were in successful Asian Green Revolutions (for example replenishment of soil fertility, and social protection for poor subsidy recipients) and to identify other, perhaps more important, outcomes from subsidy use in these green revolutions or in more recent input subsidy programmes. Such outcomes include:

- long term ‘thickening’ of supply chains and rural markets;
- lower staple food prices and higher wages;
- increased real incomes for poor non-recipients as a result of food price and wage changes; and
- longer term structural changes in livelihoods and the rural and national economy with expanded domestic demand for higher value livestock and horticultural products and for non farm goods and services together with expanded supply capacity, due to release of land and labour as a result of increased staple crop productivity.

These debates, together with new insights into development processes, require a revisiting of the conventional wisdom on subsidies:

- a re-examination of the empirical and historical and empirical record of success and failure;
- an examination of the various development opportunities and constraints facing African farmers;
- a re-examination of theoretical understanding of contributions and implementation modalities of agricultural input subsidies in such situations; and
- a more holistic conceptual framework for examining the roles, instruments and implementation of input subsidies

The remainder of this section addresses each of these issues to provide a basis for a review of recent experience with input subsidies in Africa in the subsequent section.

9.2.1 Revisiting input subsidies’ historical successes and failures

A detailed examination of the empirical record of subsidies’ historical successes and failures is beyond the scope of this paper. However we briefly consider first the Asian green revolution experience with input subsidies and then African experience up to the early 1990s.

The Washington consensus and then the Post Washington consensus on agriculture recognised the substantial success of the green revolution in Asian countries in driving growth and poverty and reduction but, implicitly or explicitly, considered this to have been achieved despite, rather than assisted by, input

subsidies (and other subsidised services). This position was taken despite long standing work showing the importance of subsidies in Indonesia, for example, in promoting agricultural growth (Timmer, 2004) in precisely the types of situations where the analysis presented earlier suggests that such subsidies might have the greatest effect (food staples in large countries, with high physical returns from input use). Dorward et al (2004) in a review of green revolution experience in Asia argue that sustained (but not indefinite) input subsidies were a major part of successful Green Revolution packages, making a critical contribution to thickening and thus 'kick starting markets' first within staple food supply chains and then in the wider rural economy. Djurfeldt et al (2005) also argue that input subsidies were a critical element within green revolution policies, drawing on detailed policies reviews across a range of Asian countries. Fan et al (2007) provide empirical evidence on the contribution of input subsidies to growth and poverty reduction in India in the early stages of the green revolution but not later. This confirms an important point made by Dorward et al (2004), that later ineffectiveness and inefficiencies of input subsidies should not obscure their initial contribution in driving growth forward¹¹ .

Much of the Washington consensus pessimism regarding input subsidies was founded on later inefficiency of Asian subsidies and African experience of such subsidies. The Berg report criticised input subsidies as a major element in fiscally and economically unsustainable policies that were highly inefficient, ineffective and expensive in Africa. These policies distorted market incentives, blunted competitiveness and farmer incentives, and undermined the growth of private sector services. In this, subsidised input systems may have looked good for farmers (as regards services that were supposed to be provided), but the theoretical difficulties discussed earlier were compounded by diversion and inefficiency such that actual benefits to farmers were often very limited (World Bank, 1981). It should be noted, however, that there are countries that implemented input subsidy systems that had initial success in raising productivity but for varying political and economic reasons failed to sustain the fiscal investment and market systems necessary for sustained benefits (for example Zimbabwe and Malawi).

Dorward et al (2009) compare experience of state led and private market led development approaches in fostering widespread and sustained growth in smallholder food staples. They note that while there are egregious examples of failure with state led approaches, there are also examples of dramatic success (as noted above). Private market led approaches, on the other hand, have very few

¹¹There are, ironically, parallels here with debates about the importance of agriculture itself as an initial driver of growth in poor rural economies: the later relative decline of agriculture in emerging economies should not obscure its earlier importance in getting broad based growth going.

examples of success¹², and many failures, but the failures of continued rural poverty are more hidden in rural areas and, to economists and policy analysts working with governments and businesses, consequent chronic humanitarian problems may be less obvious than macro-economic and fiscal crises.

9.2.2 Development opportunities and constraints facing African farmers

Successful investments in input subsidies in the Asian green revolution cannot, however, be simply transferred across to African countries – as experience in the 1970s and 1980s showed. It is important to identify the situations where input subsidies could work to take opportunities and overcome constraints facing African farmers.

Poulton and Dorward (2008) and Dorward, Chirwa and Poulton (2008) consider constraints and opportunities for growth for different agricultural products in different situations in Africa and southern Africa. These are summarised in table 1 overleaf (adapted from Poulton and Dorward, 2008, and from Dorward et al , 2008).

Drawing on insights from Byerlee et al. 2006 and Hazell et al. 2007, this table presents a typology that sets out first the major roles for increased productivity for different types of agricultural products in countries with different characteristics, and then the major challenges that need to be addressed to achieve increased productivity. Distinctions are made first between different types of crops and products (and implicitly between different agro-ecological zones associated with these). Maize, rice (notably NERICA) and possibly wheat (though this is a much less important crop in Africa) are cereals with potential high responses to significant investments in inorganic (and organic) fertiliser application. Millet and sorghum have generally lower yield potential, but there are still possibilities for significant yield responses in the context of integrated soil fertility management (ISFM) practices involving, for example, better water control, use of organic matter and micro-dosing with critical nutrients¹³. Root crops, particularly cassava, have the potential for significant yield increases with intensification but although with time this will require substantial increases in fertiliser inputs, there are initial opportunities for major yield increases from improved varieties. Non-staple products are considered in terms of non-tradables and tradables, the latter broken down between domestically

¹²It can also be argued that private market led approaches have never been properly tried – liberalisation of food markets has proved very difficult to consistently implement- and not just in Africa. This is, however, another challenge to private market led approaches. An exception to this has been the recent growth of smallholder fertiliser use in Kenya (Ariga et al, 2008) which, while aided by special conditions which prevent its wholesale application to other countries, nevertheless carries important lessons.

¹³Morris et al. 2007 present data suggesting that maize and rice tend to have higher fertilizer responses than sorghum and millet, but that for all crops the responses are highly variable and sensitive to rainfall, soils, fertilizer application methods and formulations, and complementary soil and other management practices.

consumed and exported tradables.

The high potential yields achievable with the 'high response cereals' and 'roots and tubers' suggests that these have the potential to make a major contribution to driving and supporting pro-poor growth in countries where these crops can be produced, depending on other potential drivers of growth in these countries.

The lower but still improved yields achievable with 'low response cereals' in more challenging agro-ecological conditions suggest that these will not be able to drive growth but they should have important roles in supporting growth and in providing a lower cost and more developmentally beneficial subsistence safety net (as compared with humanitarian relief). Again the role will vary between countries with opportunities for minerals, manufacturing industries and cash crops to drive growth (although the more challenging agro-ecologies where these crops are grown are also likely to limit cash crop and livestock development options¹⁴).

The lower part of the table lists major challenges faced by the different products (assuming that they are being produced in broadly suitable agro-ecological areas). All products face technical challenges and opportunities to increase productivity and stability, though the nature and extent of these challenges and opportunities varies between products and contexts. There is also common under investments in public goods provision (technical research and extension, market and institutions) particularly for staples where prices and value chain profits are limited. All products are also affected by uncertainty and variability in global commodity prices as they affect input and output prices. However the location of the text and thickness of arrows in table 9.2 also show that there are considerable differences between different products in the challenges they face.

The key points here as regards consideration of roles of input subsidy programmes are that while high response cereals are (with roots and tubers) the products with the greatest importance and potential for driving and/or spreading growth they are also the crops which are most affected by challenges and failures in complementary service coordination, price instability, the price/productivity tightrope¹⁵, and seasonal input finance provision. These characteristics suggest that high response cereals fulfill many of the requirements identified in section 9.1 for well designed and implemented input subsidies to have a role to play in stimulating pro-poor growth:

¹⁴In such situations investment in increased staple productivity may be a least cost way of providing safety nets in a way that encourages economic activity rather than dependency.

¹⁵The price/productivity tightrope refers to the dilemma in poor agrarian countries where on the one hand high food prices are needed to stimulate investment in inputs but on the other hand such prices damage poor consumers who spend a large part of their income on staple foods, and thus undermine poor consumer welfare and wider pro-poor growth.